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34TH ANNUAL CONFERENCE OF INDIAN SOCIETY FOR STUDY OF PAIN (ISSPCON 2019)
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MESSAGE FROM PRESIDENT OF ISSP

Dear colleagues and friends,

I welcome you all at our 34th annual national conference of Indian Society for Study of Pain at Bengaluru. Our Bengaluru team is working hard to make this scientific program a memorable one and I am sure that we all will learn and enjoy this conference with sweet memories.

Pain management specialty is growing fast globally, and we feel proud that we are also advancing equally. Indian pain physicians have good contribution in this specialty and in future this contribution is going to increase further.

I just request to each and every society member to publish their clinical works, contribute more in this specialty and take this specialty further ahead. Let Indian pain physicians do innovative works to serve their countrymen and are remembered everywhere for their great works.

I expect that this conference will be a great meeting place to discuss and exchange our ideas to take our specialty ahead.

Long live ISSP!

Gautam Das
President, ISSP
MESSAGE FROM HONORARY SECRETARY OF ISSP

Dear Friends,

It gives me immense pleasure to write a message for the 34th Annual National Conference of India society for the study of pain, being held in the IT city of India, Bengaluru.

I have witnessed the hard work and efforts by the organizing committee and the scientific committee and have gone through the scientific program and could see its rich qualitative academic content. I am also able to envisage its potential to discuss and learn the ‘Art and Science’ of pain management. For any scientific society, it is important to develop an attitude towards research, evidence building, and consensus and this conference would be a major step towards this goal in the field of Pain Medicine.

I wish the conference a great success and I am sure it will be a grand scientific extravaganza.

Dr (Maj) Pankaj N Surange
Director, IPSC India
Hon Secretary, ISSP- National
MESSAGE FROM ORGANISING CHAIRMAN

Dear Fellow Delegates,

It is with immense pleasure we welcome you to the 34th Annual National Conference of the Indian Society for Study of Pain –ISSPCON 2019 at NIMHANS, Bengaluru. It is our privilege to host the 3rd national conference in the garden city of Bengaluru.

The theme of the conference “Going beyond the Alpha and Omega of Pain”, we are in for detailed discussion about both fundamental and advanced concept of pain management during conference.

I have great pleasure in greeting and congratulating the souvenir committee for bringing out such an engaging Souvenir. Generally, Souvenirs are but vehicles for advertisements! But this committee has endeavoured to make the Souvenir interesting by including abstracts and other articles of interest to all of us. I do hope you enjoy reading it.

I would like to extend my sincere thanks to the organizing Committee headed by Dr. Muralidhar Thonebhavi a true ring leader, and consisting of scientific committee by Dr. Raghavendra Ramnujulu and team, finances by Dr.H.C.Rajesh and team others fellow committee members by the untiring effort.

I would also like to thank all the advertisers who have made it possible to bring this Souvenir out. It is only with their kind-hearted support that we manage to conduct a conference of this magnitude.

Congratulations again,

Best Wishes

Dr. N. S Chandrashekara
Organizing Chairman
MESSAGE FROM GUEST OF HONOUR

It is a matter of immense pleasure to know that ISSPCON 2019 will be organized in the Silicon city of Bengaluru the first week of February. Bengaluru is the health capital of the country where in all specialized institution both medical and scientific organizations involved in providing quality health care for the patients.

The theme of the conference is 'Going Beyond the Alpha and Omega of Pain' through this the association will create awareness both in public and among professionals. I hope the organizers will bring out the proceedings with good guidelines. This will help in spreading message for a quality care to suffering patients.

I wish Dr. N.S.Chandrashekar the Chairman and his team best wishes and success of the conference.

Prof. K.S.Gopinath
Promoter Director HCG Hospital
34TH ANNUAL CONFERENCE OF INDIAN SOCIETY FOR STUDY OF PAIN (ISSPCON 2019)

COMMITTEE

Organising Committee

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Organising Chairman

Dr. Vinod
Organising Vice-Chairman

Dr. Murali Thondebhavi
Organising Secretary

Dr. Rajesh HC
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Dr. Hirachand Mutagi
Dr. Akkamahadevi
Dr. Pratibha Matche

Dr. Arun V
Dr. Mythili Kalladka
Dr. Shivanna
Dr. Harsha Shanthanna.
Catering

Dr. Rajesh HC  
Dr. NS Chandrasekhar  
Dr. Vijayanand

Trade

Dr. Vijayanand  
Dr. Arun  
Dr. Manjunath  
Dr. Ashok  
Dr. Raghunath Rao

Reception / Inauguration

Dr. Chandrika Dutt  
Dr. Namratha

Accommodation / Transport

Dr. VB Gowda  
Dr. Reddy  
Dr. Raghunandan Madhavamurthy
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Dr. Kritika M Doshi
Dr. Palak B Mehta

Dr. Umamaheshwar Rao
Dr. Dinesh Kumar Sahu
Dr. Debjyoti Dutta
INAUGURAL SESSION – 1st February 2019

Inaugural Agenda

- Lamp Lighting
- Invocation Song
- Welcome Address by Dr. K.S. Chandrashekhar
  Chairperson of the LOC
- Welcome Address by JSSP President
  Dr. Gautam Das
- Reporting highlights of JSSP main activities by
  Dr. Pankaj Srivastava
  (Hon. Secretary - JSSP)
- Honoring Life Time Achievement Awardee
  Dr. Ramesh Kumar Mohan
- Felicitating past presidents of JSSP
- Inaugural Address by Dr. Tapas Kundu
  Director, CSTR-CDRI - Chief Guest
- Guest lecture by
  Dr. K.S. Gopinath
  Guest of Honour
- Release of book by Chief Guest
  Dr. Tapas Kundu & dignitaries
- Vote of Thanks by
  Dr. Murari Thondeshvari
  Organizing Secretary of the LOC
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<thead>
<tr>
<th>Dr. Chandrika Dutt</th>
<th>Dr. Neha Agrawal</th>
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<tr>
<td>Dr. AC Manjunath</td>
<td>Dr. Atul Sharma</td>
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<td>Dr. Raghavendra R</td>
<td>Dr. V.Bhadri Narayan</td>
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<td>Dr. Murali Thondebhavi</td>
<td>Dr. Geeta Joshi</td>
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<td>Dr. Milon Mitrogotri</td>
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<td>Dr. Palaniswamy Vijayanand</td>
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<td>Dr. Akkamahadevi</td>
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<td>Dr. Pratibha Matche</td>
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<td>Dr. Ram Murthy Kulkarni</td>
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<td>Dr. Sadasivan Iyer</td>
<td>Dr. Basavapatna Jagadish</td>
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<td>Dr. Vinod N Krishnamurthy</td>
<td>Dr. Lakshmi Koyyalagunta</td>
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<td>Dr. Ananth Prasad Rao H T</td>
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<td>Dr. Narendra Babu</td>
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<td>Dr. Vasudeva Upadhyaya</td>
<td>Dr. Muralidhar Joshi</td>
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<td>Dr. Saraswathi Devi</td>
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<td>Dr. Pushpa Lengade</td>
<td>Dr. Gaurav N Goyal</td>
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<td>Dr. Sunita Lawange</td>
<td>Dr. Malvinder Saahi</td>
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<td>Dr. Mary Korulla</td>
<td>Dr. Rachna Varma</td>
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<td>Dr. V.S Gowda</td>
<td>Dr. Nafisa Taha</td>
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<td>Dr. Bibuthi Mishra</td>
<td>Dr. S Adinarayan</td>
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<td>Dr. Vandana Mangal</td>
<td>Dr. Ravindra Harne</td>
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<td>Dr. S. Vijayanand</td>
<td>Dr. Hitesh Patel</td>
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<td>Dr. Javed Khan</td>
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<td>Dr. Palak Mehta</td>
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<td>Dr. Dheeraj Dumir</td>
<td>Dr. Chitaranjan Das</td>
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<td>Dr. Kamal Kumar Fotedar</td>
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<td>Dr. Jayashree Sood</td>
<td>Dr. Dara Sudheer</td>
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<td>Dr. N. S. Kodandaram</td>
<td>Dr. Aparna Chatterjee</td>
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<td>Dr. Pradeep Jain</td>
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<tr>
<td>Dr. Vishal Gunjal</td>
<td>Dr. Madan Pandian</td>
<td>Dr. Shiraz Ahmed Munshi</td>
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<td>Dr. Dhruv Bibra</td>
<td>Dr. Rajat Gupta</td>
<td>Dr. Rohit Gulati</td>
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<td>Dr. Kailash Waghmare</td>
<td>Prof. Vidy Ramamoorthy</td>
<td>Dr. Chandrashekharan Cham</td>
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<td>Dr. Vanmathy V</td>
<td>Dr. Seema Mishra</td>
<td>Dr. Devender Singh</td>
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<td>Dr. Michelle Normen</td>
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<td>Dr. Gaurav Chanana</td>
<td>Dr. Sunny Malik</td>
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<td>Dr. Naveen Mathotra</td>
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<td>Dr. Debanjali Ray</td>
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<td>Dr. Raghunath Rao</td>
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<td>Dr. Amit Dua</td>
<td>Dr. Anandh Balasubramaniam</td>
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## SCIENTIFIC PROGRAMME

### WORKSHOP DETAILS

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<th>Venue</th>
<th>Time</th>
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<tbody>
<tr>
<td>Ultrasound Guided Blocks for Chronic Pain Management [MSK and Hands on Cadaveric]</td>
<td>Ramaiah Advanced Learning Centre</td>
<td>8:00 AM to 5:00 PM</td>
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<tr>
<td>Myofascial Pain Workshop (RECOUP team)</td>
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<tr>
<td>Evaluation of a Chronic Pain Patient</td>
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<tr>
<td>Hands-on Cadaveric Fluoroscopic and Ultrasound workshop</td>
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### Ultrasound guided interventions in Pain Management

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<th>Activity</th>
<th>Faculty</th>
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<td>8:00 - 8:30 AM</td>
<td>Introduction / registration</td>
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<td>8:30 - 9:30 AM</td>
<td>Lectures 10min each (6 lectures)</td>
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<td></td>
<td><strong>Sonoanatomy / Indications / Pearls/</strong></td>
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<td></td>
<td>Shoulder / Elbow - Dr Umamaheshwar Rao</td>
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<td>Cervical Roots / Stellate - Dr Sudhakar Koppad</td>
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<td>Cervical Facets / Suprascapular Nerve - Dr SenthilKumar Raju</td>
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<td></td>
<td>Hip - Dr Kumar</td>
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<td></td>
<td>Lumbar Spine / SIJ / Lumbar Facets - Dr Ravikrishna K</td>
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<td>9:30 - 09:45 AM</td>
<td>Tea Break</td>
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<td>9:45 - 10:30 AM</td>
<td>Volunteer screening with projector</td>
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<td>Shoulder / Lumbar Spine / SIJ / Piriformis / Hip</td>
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<tr>
<td>10:30 - 13:30 PM</td>
<td>2 Sessions</td>
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<td>14:00 - 16:15 PM</td>
<td>3 Sessions</td>
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<td>16:15 - 16:30 PM</td>
<td>Wrap-up</td>
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<td><strong>MSK Ultrasound (Volunteer)-Shoulder / Elbow</strong></td>
<td>Dr Umamaheshwar Rao / Dr Amodh Manocha</td>
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<td></td>
<td><strong>MSK Ultrasound (Volunteer)-Cervical Spine / Suprascapular Nerve + Stellate</strong></td>
<td>Dr. Sudhakar Koppad/ Dr. SenthilKumar Raju</td>
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<td></td>
<td><strong>MSK Ultrasound (Volunteer)-Lumbar spine / Caudal / Sacroiliac Joint/Piriformis</strong></td>
<td>Dr. Rajendra Sahoo / Dr.Neeraj Jain</td>
</tr>
<tr>
<td></td>
<td><strong>MSK Ultrasound (Volunteer)-Hip / Knee</strong></td>
<td>Dr. Kumar / Dr. Madan Pandian</td>
</tr>
<tr>
<td></td>
<td><strong>Cadaveric -Cervical spine /Lumbar Spine/ SIJ/ Caudal</strong></td>
<td>Dr. Ravikrishna Kalathur / Dr. Murali</td>
</tr>
</tbody>
</table>
# EVALUATION OF CHRONIC PAIN PATIENT

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 - 8:30 AM</td>
<td>Registration</td>
<td></td>
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<tr>
<td>8:30 - 9:00 AM</td>
<td>“Importance of Clinical Evaluation” - Dr. Gautam Das</td>
<td></td>
</tr>
<tr>
<td>9:00- 9:30 AM</td>
<td>Pre Test + Division of Delegates Into Batches A &amp; B</td>
<td></td>
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</tbody>
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**BATCH-A**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30 – 10:00 AM</td>
<td>Examination of Cervical Spine</td>
<td>Dr. Ram Murthy Kulkarni Dr. Ravi Shankar Sharma</td>
</tr>
<tr>
<td>10:00-10:30 AM</td>
<td>Examination of Shoulder, Wrist &amp; Elbow</td>
<td>Dr. Nishad P.K Dr. Kanchan Sharma</td>
</tr>
<tr>
<td>10:30-11:00 AM</td>
<td>Examination of Hip, Knee &amp; Ankle Joint</td>
<td>Dr. Gurumurthy Dr. Samarjeet</td>
</tr>
<tr>
<td>11:00-11:30 AM</td>
<td>Examination of Lumbar Spine</td>
<td>Dr. Sunita Lavange Dr. Varshali Keniya</td>
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</tbody>
</table>

**BATCH-B**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30 – 10:00 AM</td>
<td>Neurological Examination</td>
<td>Dr. Nupur Pruthi</td>
</tr>
<tr>
<td>10:00-11:30 AM</td>
<td>DIAGNOSTIC MSK USG STATION 1 – Shoulder, Elbow, Wrist</td>
<td>Dr. Navita Purohith Dr. Harshita Surange</td>
</tr>
<tr>
<td></td>
<td>DIAGNOSTIC MSK USG STATION 2 – Hip, Knee, Ankle</td>
<td></td>
</tr>
<tr>
<td>11:30-12:00 AM</td>
<td>Tea Break + Both batches joining for next combined session</td>
<td></td>
</tr>
<tr>
<td>12:00 -12:30 PM</td>
<td>EMG+NCS</td>
<td>Dr. Soorya Narayan Dr. Sharma</td>
</tr>
<tr>
<td>12:30-1:00 PM</td>
<td>Psychological Evaluation</td>
<td>Dr. Michelle</td>
</tr>
<tr>
<td>1:00- 2:00 PM</td>
<td>Lunch</td>
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</tbody>
</table>

**BATCH-A**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Faculty</th>
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</thead>
<tbody>
<tr>
<td>2:00- 2:30 PM</td>
<td>Neurological Examination</td>
<td>Dr. Nupur Pruthi</td>
</tr>
<tr>
<td>2:30- 4:00 PM</td>
<td>DIAGNOSTIC MSK USG STATION 1 – Shoulder, Elbow, Wrist</td>
<td>Dr. Navita Purohith Dr. Harshita Surange</td>
</tr>
<tr>
<td></td>
<td>DIAGNOSTIC MSK USH STATION 2 – Hip, Knee, Ankle</td>
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**BATCH-B**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Faculty</th>
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<tbody>
<tr>
<td>2:00 – 2:30 PM</td>
<td>Examination of Cervical Spine</td>
<td>Dr. Ram Murthy Kulkarni Dr. Ravi Shankar Sharma</td>
</tr>
<tr>
<td>2:30- 3:00 PM</td>
<td>Examination of Shoulders, Wrist &amp; Elbow</td>
<td>Dr. Nishad P.K Dr. Kanchan Sharma</td>
</tr>
<tr>
<td>3:00- 3:30 PM</td>
<td>Examination of Hip, Knee &amp; Ankle Joint</td>
<td>Dr. Gurumurthy Dr. Samarjeet</td>
</tr>
<tr>
<td>3:30- 4:00 PM</td>
<td>Examination of Lumbar Spine</td>
<td>Dr. Sunita Lavange Dr. Varshali Keniya</td>
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</tbody>
</table>

| 4:00 - 4:30 PM | Post Test, Doubt Clearing, Feedback             |                                                                         |
Fluroscopic-Guided Pain Interventions Cadaver Workshop

A state of the art world-class cadaver lab, with exceptional facilities. A unique fresh frozen cadaver preservation technique ensuring preserved tissue texture for exceptional hand-on training under the guidance of renowned faculty. Low delegates to faculty (& cadaver) ratio at each station to provide sufficient hands-on exposure. A 6th demonstration cadaver station for advanced pain techniques, tailored to the delegates demand.

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Faculty</th>
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</thead>
<tbody>
<tr>
<td>8.00-8.20AM</td>
<td>Registration</td>
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<tr>
<td>8.20 – 8:50 AM</td>
<td>Welcome address</td>
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<tr>
<td></td>
<td>Selection is the key!!! - Introduction to Interventional Pain Medicine</td>
<td>Dr. Mahesh Menon – 10 minutes</td>
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<td></td>
<td>• Housekeeping inclusive of Respect for Cadaver Donors</td>
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</tr>
<tr>
<td>8.50 – 9.00 AM</td>
<td>Cadaver lab groups &amp; Cadaver lab attire group and preparation</td>
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</table>

Workshop (all cadaveric stations):

Morning Session: 40 minutes at each station
(5 min station introduction, 5 min faculty demo, 30 min hands on)

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<tr>
<th>Time</th>
<th>Activity</th>
<th>Faculty</th>
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<tbody>
<tr>
<td>9.00- 11.00 AM</td>
<td>Three cadaver station rotation</td>
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<tr>
<td>11.00-11.15 AM</td>
<td>Tea Break</td>
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<tr>
<td>11.15 - 13.15 PM</td>
<td>Three cadaver stations rotation</td>
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</table>

- **Station 1:** Lumbar Spine (Fluoroscopy):
  - Facet, MBB, root block, Lumbar epidural, Caudal epidural, SIJ, Lumbar RF
  - Dr. Vijayanand P, Dr. Pradeep Jain, Dr. Vishal Gunjal

- **Station 2:** Cervical Spine (Fluoroscopy):
  - Cervical facet, MBB, Interlaminar epidural, root block, Cervical RF
  - Dr. Shamim Haider, Dr. Vijay Bandikatla, Dr. Hammad Usmani

- **Station 3:** Head and face (fluoroscopy):
  - Trigeminal block (RF Ablation), Spheno-palatine block
  - Dr. Sudheer Dara, Dr. Subrato Goswami, Dr. R Bathina

- **Station 4:** Sympathetic blocks (fluoroscopy):
  - Lumbar sympathetic block, Hypogastric plexus, Caeliac plexus, splanchnic nerves
  - Dr. Raghu Thota Dr. Babita Ghai, Dr. Sudhindra D

- **Station 5:** Head and Neck, shoulder (Ultrasound):
  - Cervical facet, MBB, Root block, Stellate block, Subacromial, Intra-articular glenohumoral, suprascapular
  - Dr. Nagaraj Morubagal, Dr. Shiv Pratap Singh Rana

- **Station 6:** Thoracic and LumboSacral (Ultrasound):
  - Facet, ESP block, paravertebral, Caudal, SIJ, Pyriformis, glutmedius and minimus tendons, Quadratus Lumboorum, Psoas block, Pudendal nerve.
  - Dr. Sadashivan Iyer, Dr. Rajeshree M
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Faculty Members</th>
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</thead>
<tbody>
<tr>
<td>13.15 - 14.00 PM</td>
<td>Lunch</td>
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<tr>
<td>Afternoon Session: (No designated tea break – rolling tea for 15.00-15.30)</td>
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<tr>
<td>14:00 – 14.45 PM</td>
<td>Demonstration Spinal Cord Stimulator lead placement +/- IPG implantation</td>
<td>Station 1: Faculty- Dr. Lashmi Koyyalgunta, Dr. Sadashivan Iyer</td>
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<td></td>
<td></td>
<td>Station 3: Faculty- Dr. Ramesh Bathina, Dr. Sangeeta Das.</td>
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<tr>
<td>14.45 – 15.45 PM</td>
<td>Demonstration (station 2) - Endoscopic Discectomy</td>
<td>Dr. Shiv Pratap Singh Rana, Dr. Kailash Kothari</td>
</tr>
<tr>
<td>15.45 – 16.45 PM</td>
<td>Recess block, Sub-Annular discography (@ 3 stations)</td>
<td>Station 1: Dr. Kailash Kothari, Dr. Pravesh Kanthed</td>
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<td></td>
<td>Station 2: Dr. Shiv Pratap Singh Rana, Dr. Raghu Thota</td>
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<td></td>
<td></td>
<td>Station 3: Dr. Sudheer Dara, Dr. Hirachand Mutagi</td>
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<tr>
<td>15.45 – 16.45 PM</td>
<td>Open stations</td>
<td>station 4 – fluoroscopy</td>
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<tr>
<td></td>
<td></td>
<td>Dr. Goswami, Dr. Sangeeta Das, Dr. Shamim Haider</td>
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<td></td>
<td>station 5 – Ultrasound</td>
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<td></td>
<td></td>
<td>Dr. Nagaraj M, Dr. Sadashivan Iyer</td>
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<td>station 6 – Ultrasound</td>
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<td></td>
<td>Dr. Babita Ghai, Dr. Rajeshree M</td>
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<tr>
<td>16.45 PM</td>
<td>Debrief / Vote of Thanks / Feedback</td>
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<tr>
<td>Time</td>
<td>Theme</td>
<td>Chairperson</td>
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<tr>
<td>08:00-09:00 Hrs</td>
<td>Registration</td>
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<td>09:00-9:30 Hrs</td>
<td>Flag Hoisting</td>
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<tr>
<td>09:30-09:50 Hrs</td>
<td>Plenary Talk 1 - Acute pain management problems at its successful establishment and way forward by Dr. PN Jain</td>
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<tr>
<td>09:50-10:10 Hrs</td>
<td>Plenary Talk 2 - Stimulator the existing requirement to Indian patients and the way ahead by Dr. Murlidhar Joshi</td>
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<tr>
<td>10:10 - 10:30 Hrs</td>
<td>Plenary Talk 3 - Cancer pain management in resource poor setting by Dr. Sushma Bhatnagar</td>
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<tr>
<td>10:30 – 10:45 Hrs</td>
<td><strong>TEA</strong></td>
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<tr>
<td>10:45 – 12:15 Hrs</td>
<td>Themed Session 1</td>
<td>Dr. Narasimha Reddy</td>
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<tr>
<td></td>
<td>Vascular Pain: Mechanism to Advances in Treatment</td>
<td>Dr. Shamim Haider</td>
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<tr>
<td></td>
<td>Coordinator: Dr. Vijay Bandikatla</td>
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<tr>
<td>12:15 – 12:45 Hrs</td>
<td>How I do it Session</td>
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<td></td>
<td>INTERVENTION PROCEDURE</td>
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<td></td>
<td>Coordinator: Dr. Sadasivan Iyer</td>
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<tr>
<td>12:45 – 13:30 Hrs</td>
<td><strong>LUNCH</strong></td>
<td></td>
</tr>
<tr>
<td>13:30 - 15:00 Hrs</td>
<td>Themed Session 4</td>
<td>Dr. Lakshmi Koyyalagunta</td>
</tr>
</tbody>
</table>
# Day 1 | 01 Feb 2019, Hall A

<table>
<thead>
<tr>
<th>Time</th>
<th>Theme</th>
<th>Chairperson</th>
<th>Topics</th>
<th>Speakers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Evolving Times in Neuromodulation</td>
<td></td>
<td>Innovations and Expansions : A new era in the field of Neuromodulation</td>
<td>Dr. Vijay Bandikatla</td>
</tr>
<tr>
<td></td>
<td>Coordinator: Dr. Sangeeta Das</td>
<td>Dr. VB Gowda</td>
<td>Sacral Neuromodulation: Going Beyond Pain -</td>
<td>Dr. H. Mutagi</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Does Spinal Cord Stimulation have a role in Ischemic Disorders</td>
<td>Dr. Palaniswamy Vijayanand</td>
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<tr>
<td>15:00 – 15:15 Hrs</td>
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<td></td>
<td>Themed Session 7</td>
<td>Dr. YK Batra</td>
<td>The Anesthetist’s Playground: Intrathecal Space</td>
<td>Dr. Amjad Maniar</td>
</tr>
<tr>
<td>15:15 – 16:45 Hrs</td>
<td>Intrathecal Analgesia-Short term and Long term</td>
<td>Dr. Shalini Saksena</td>
<td>Let me Sprint a While - Short Term Access</td>
<td>Dr. Preeti Gupta</td>
</tr>
<tr>
<td></td>
<td>Coordinator: Dr. Mahesh Menon</td>
<td></td>
<td>The Marathoner’s Domain: The Track and the Runner - Long Term Access</td>
<td>Dr. Anandh Balasubramaniam</td>
</tr>
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<td></td>
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<td></td>
<td>In My World: What Every Pain Practitioner Wants to Know</td>
<td>Dr. Kailash Kothari</td>
</tr>
<tr>
<td>16:45 – 17:05 Hrs</td>
<td>Plenary Talk 4 - Percutaneous transforaminal endoscopic discectomy</td>
<td>Dr. Sukhdev Datta</td>
<td></td>
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<tr>
<td>18:00–19:00 Hrs</td>
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<td></td>
<td>Inaugural Session-</td>
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<tr>
<td>19:00–20:00 Hrs</td>
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<td></td>
<td>IAPM Convocation</td>
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<tr>
<td>20:00 Hrs Onwards</td>
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<td></td>
<td>Dinner</td>
</tr>
<tr>
<td>Time</td>
<td>Theme</td>
<td>Chairperson</td>
<td>Topics</td>
<td>Speakers</td>
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<td>Plenary Talk 1 - Acute pain management problems at its successful establishment and way forward by Dr. PN Jain (Hall A)</td>
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<td>Plenary Talk 2 - Stimulator the existing requirement to Indian patients and the way ahead by Dr. Murlidhar Joshi (Hall A)</td>
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<td>Plenary Talk 3 - Cancer pain management in resource poor setting by Dr. Sushma Bhatnagar (Hall A)</td>
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<tr>
<td>10:30–10:45Hrs</td>
<td><strong>TEA</strong></td>
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<tr>
<td>10:45–12:15Hrs</td>
<td>Themed Session 2</td>
<td>Dr. Narendra Babu</td>
<td>Anatomy of the spine - Its Relevance to Clinical Practice</td>
<td>Dr. Rachna Varma</td>
</tr>
<tr>
<td></td>
<td>Basic Sciences: Refined</td>
<td></td>
<td>Pain Pathways - Recent Update</td>
<td>Dr. Nafisa Taha</td>
</tr>
<tr>
<td></td>
<td>(Anatomy, Physiology, Pharmacology, Behaviour)</td>
<td></td>
<td>Evidence based Pharmacotherapy in Chronic Pain</td>
<td>Dr. S Adinarayan</td>
</tr>
<tr>
<td></td>
<td>Coordinator: Dr. Chandrika Dutt</td>
<td></td>
<td>Understanding the Psychosocial Model</td>
<td>Dr. Ravindra Harne</td>
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<tr>
<td></td>
<td>Dr. Vasudeva Upadhyaya</td>
<td></td>
<td>Developments in Pain Assesment</td>
<td>Dr. Hitesh Patel</td>
</tr>
<tr>
<td>12:15 – 12:45Hrs</td>
<td>How I do it Session</td>
<td></td>
<td>Genicular nerve RF</td>
<td>Dr. Arif Ahmed</td>
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<td></td>
<td>USG Assisted Procedure</td>
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<td>T2 T3 Ganglion RF ablation</td>
<td>Dr. Pratik M Shah</td>
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<td></td>
<td>Coordinator: Dr. Rajashree</td>
<td></td>
<td>Cervical medial branch block</td>
<td>Dr. Mohit Mahajan</td>
</tr>
<tr>
<td>12:45–13:15Hrs</td>
<td>Cancer Pain Guidelines SIG meet</td>
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<td>Dr. Raghu Thota</td>
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<tr>
<td>12:45–3:30Hrs</td>
<td><strong>LUNCH</strong></td>
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<tr>
<td>Time</td>
<td>Theme</td>
<td>Chairperson</td>
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<tr>
<td>Hrs</td>
<td>Themed Session 5</td>
<td>Dr. Geetha CR</td>
<td>Inflammatory vs Degenerative Spine Pain</td>
<td>Dr. Sidharth Verma</td>
</tr>
<tr>
<td></td>
<td>Pathophysiology and Biomechanics of Spinal Pain</td>
<td></td>
<td>Predisposition to Injuries: Vulnerable Tissues</td>
<td>Dr. Madan Pandian</td>
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<tr>
<td></td>
<td>Coordinator: Dr. Sadasivan Iyer</td>
<td>Dr. Raghavendra Kalyanasundaram</td>
<td>Pathophysiology of Discogenic back Pain</td>
<td>Dr. Rajat Gupta</td>
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<td></td>
<td>Axial vs Radicular Spinal Pain</td>
<td>Dr. Vidya R</td>
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<tr>
<td>15:00–15:15</td>
<td></td>
<td>TEA</td>
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<tr>
<td>Hrs</td>
<td>Themed Session 8</td>
<td>Dr. Saraswathi Devi</td>
<td>Central pain syndromes</td>
<td>Dr. Javed Khan</td>
</tr>
<tr>
<td>15:15–16:45</td>
<td>Clinical Pain States/Syndromes: Demystified to practical relevance</td>
<td></td>
<td>Advances in the understanding of CRPS</td>
<td>Dr. Palak Mehta</td>
</tr>
<tr>
<td>Hrs</td>
<td>Coordinator: Dr. A C Manjunath</td>
<td>Dr. Pushpa Lengade</td>
<td>Persistent Post - Surgical Pain: A challenge</td>
<td>Dr. Chitaranjan Das</td>
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<td></td>
<td></td>
<td>Immune related pain</td>
<td>Dr. Mithilesh Kumar Mishra</td>
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<td>16:45–17:05</td>
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<tr>
<td>Hrs</td>
<td>Plenary Talk 4 - Percutaneous transforaminal endoscopic discectomy</td>
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<td></td>
<td>- Dr. Sukhdev Datta (Hall A)</td>
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<td>18:00–19:00</td>
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<tr>
<td>Hrs</td>
<td>Inaugural Session (Hall A)</td>
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<td>19:00–20:00</td>
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<td>Hrs</td>
<td>IAPM Convocation (Hall A)</td>
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<td>Onwards</td>
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<td>09:30–09:50 Hrs</td>
<td>Plenary Talk 1 - Acute pain management problems at its successful establishment and way forward by Dr. PN Jain (Hall A)</td>
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<td>09:50–10:10 Hrs</td>
<td>Plenary Talk 2 - Stimulator the existing requirement to Indian patients and the way ahead by Dr. Murlidhar Joshi (Hall A)</td>
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<td>10:00–10:30 Hrs</td>
<td>Plenary Talk 3 - Cancer pain management in resource poor setting by Dr. Sushma Bhatnagar (Hall A)</td>
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<td>10:45–12:15 Hrs</td>
<td>Themed Session 3</td>
<td>Dr. Sukdev Nayak</td>
<td>Addressing epidemic of pain in India on a background of global opioid epidemic: The balancing act</td>
<td>Dr. Megha Pruthi</td>
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<td>Opioids in the management of Chronic Pain: The Era of Opioid Epidemic</td>
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<td>Indiscriminate use of non-controlled opioid analgesics in India: Potential recipe for opioid epidemic</td>
<td>Dr. Jay Panchal</td>
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<td>Coordinator: Dr. Naveen Salins</td>
<td>Dr. K B Linge Gowda</td>
<td>Relaxation of opioid use regulation versus call for tighter opioid regulation: The oscillating pendulum</td>
<td>Dr. Sweta Salgaonkar</td>
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<td>Contextualising the facts and figures of global opioid epidemic to India: Generalisability and Applicability</td>
<td>Dr. Sukanya Mitra</td>
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<td>12:15–12:45 Hrs</td>
<td>How I do it Session</td>
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<td>Inside out technique</td>
<td>Dr. Shiv Pratap Singh Rana</td>
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<td>Endoscopic discectomy</td>
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<td>Outside In Technique</td>
<td>Dr. Shiraz Ahmed Munshi</td>
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<td>Interlaminar Technique</td>
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<td>Newer Endoscopic techniques</td>
<td>Dr. Sukdeb Datta</td>
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<td>13:30 - 15:00 Hrs</td>
<td>Themed Session 6</td>
<td>Dr. Neha Agrawal</td>
<td>Orofacial Pain and Temporomandibular Disorders</td>
<td>Dr. Archana Viswanath</td>
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<td>Headache, Migraine and Orofacial Pain Syndromes:</td>
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<td>Neuropathic Orofacial Pain- Diagnosis and Management</td>
<td>Dr. Ruchika Sood</td>
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<td>Dr. Atul Sharma</td>
<td>Headaches, Cervicogenic Headache-A Primer</td>
<td>Dr. Joysree Subramanian</td>
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<td>Interventions for the Management of Orofacial Pain and Headaches</td>
<td>Dr. Amit Dua</td>
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<td>15:15 – 16:45 Hrs</td>
<td>Themed Session 9</td>
<td>Dr. Tarlika Doctor</td>
<td>Pelvic pain in women - Are they all Cyclical?</td>
<td>Dr. Madhuri Lokapur</td>
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<td>Chronic Pelvic Pain: Headache in the Pelvis</td>
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<td>Pelvic pain in men are they all Noncyclical?</td>
<td>Dr. Kritika M Doshi</td>
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<td>Dr. Bibhukalyani Das</td>
<td>Etiology of pelvic pain in men</td>
<td>Dr. Raghunath S.K</td>
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<td>Importance of Nonpharmacological Management</td>
<td>Dr. Krishna Poddar</td>
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<td>Innovative Therapies for Pelvic Pain</td>
<td>Dr. Lakshmi Vas</td>
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<td>Plenary Talk 4 - Percutaneous transforaminal endoscopic discectomy</td>
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<td>8:30-10:00</td>
<td>Themed Session 10</td>
<td>Dr. Rajeev Harshe</td>
<td>Fibromyalgia vs Myofascial pain Syndrome: A Recent Update</td>
<td>Dr. Nana Morkane</td>
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<td>Musculoskeletal Pain/ Fibromyalgia Update: The forgotten Organ</td>
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<td>Muscular Syndromes in Lower Back and Pelvis</td>
<td>Dr. Rajendra Sahoo</td>
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<td>Coordinator: Dr. Pratibha Matche</td>
<td>Dr. S.B. Gangadhar</td>
<td>Sports Injuries and Work Related MSK Disorders - Role of Pain Physician</td>
<td>Dr. Basabjit Das</td>
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<td>Fluoroscopy Vs USG for Interventions in Musculoskeletal Pain - Fluoroscopy</td>
<td>Dr. R Gurumoorthi</td>
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<td>Fluoroscopy Vs USG for Interventions in Musculoskeletal Pain - Ultrasound</td>
<td>Dr. Senthilkumar Raju</td>
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<td>ISSP Oration by Dr. AS Kameshwar Rao</td>
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<td>Dr. Rohit Gulati</td>
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<td>Sphenopalatine Ganglion RF</td>
<td>Dr. Chandrashekharan Cham</td>
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"TEA" indicates a break for tea, and "LUNCH" indicates a break for lunch.
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<td>13:45 - 15:15 Hrs</td>
<td>Themed Session 16</td>
<td>Dr. V. Bhadri Narayan</td>
<td>Pathophysiology of Neuropathic pain - An Update</td>
<td>Dr. Samarjit Dey</td>
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<td>Neuropathic Pain: Have we changed from definition to management</td>
<td>Dr. Geeta Joshi</td>
<td>Confirmation of Neuropathic Pain</td>
<td>Dr. Raj Kumar Arora</td>
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<td>Coordinator: Dr. Sriganesh K Dr. Geeta Joshi</td>
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<td>Clinical Practice Guidelines for Management of Neuropathic Pain</td>
<td>Dr. Subin Sukesan</td>
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<td>Prevention and Prediction of Neuropathic Pain</td>
<td>Dr. Shamim Haider</td>
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<td>15:30 - 16:45 Hrs</td>
<td>Themed Session 19</td>
<td>Dr. Muralidhar Joshi</td>
<td>Conventional Radiofrequency Its Role and Evidence</td>
<td>Dr. Jitendra Jain</td>
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<td>The World of Radiofrequency: Development, relevance and trends</td>
<td>Dr. Balavenkat Subramanian</td>
<td>Pulsed Radiofrequency Its Role and Evidence Advances in the understanding of CRPS</td>
<td>Dr. Jeetinder Kaur Makkar</td>
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<td>Cooled Radiofrequency Its Role and Evidence</td>
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<td>The Clinical Relevance of Radiofrequency Modality</td>
<td>Dr. Ramesh Bathina</td>
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<td>8:30-10:00 Hrs</td>
<td>Themed Session 11</td>
<td>Dr. Joyshankar J Jana</td>
<td>Advantages of interdisciplinary management: Evidence based outcomes</td>
<td>Dr. Dara Sudheer</td>
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<td>Interdisciplinary Pain Team: Filling the Lacunae over MULTIDISCIPLINARY SERVICES</td>
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<td>What constitutes interdisciplinary pain management (components)?</td>
<td>Dr. Aparna Chatterjee</td>
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<td>Coordinator: Dr. Raghavendra Ramanjulu</td>
<td>Dr. Mary Korulla</td>
<td>Challenges: Resources, cost and conflicts?</td>
<td>Dr. Madhujeet Gupta</td>
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<td>Interdisciplinary Team - Our experience</td>
<td>Dr. Babita Ghai</td>
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<td>ISSP Oration by Dr. AS Kameshwar Rao (Hall A)</td>
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<td>Presidential Keynote address by Dr. Gautam Das</td>
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<td>Topic: Evidence Based Medicine in Pain Practice: Present &amp; F</td>
<td>Dr. NS Chandrashekar &amp;</td>
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<td>11:15 – 12:45 Hrs</td>
<td>Themed Session 14</td>
<td>Dr. B Radhakrishnan</td>
<td>Whats in the blood - A Pain Physician’s View</td>
<td>Dr. Venkatesh Nevagi</td>
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<td>Right Diagnostic modalities in Chronic Pain: Pivotal cue to Conclusion</td>
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<td>MRI Spine - How to Read and make Sense of it</td>
<td>Dr Pravesh Kanthed</td>
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<td>Coordinator: Dr. Murali Thondebhavi</td>
<td>Dr. Bibuthi Mishra</td>
<td>Functional MRI - Seeing Beyond the Horizon</td>
<td>Dr Aruna Patil</td>
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<td>Sensory Testing - Whats new?</td>
<td>Dr. Deepak Sharan</td>
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<td>Cancer Pain Guidelines SIG meet</td>
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<td>Suprascapular Nerve Pulsed RF</td>
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<td>Dr. Avinash Bunduwal</td>
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<td>Dr. Dinesh Kumar Sahu</td>
<td>Pharmacokinetics and its relevance</td>
<td>Dr. Vanmathy V</td>
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<td>Clinical Pharmacology and Evidence Based Prescription</td>
<td>Ketamine - Old kid with a new Role</td>
<td>Dr. Rakesh Garg</td>
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<td>Transdermal patches - When, Why &amp; What?</td>
<td>Dr. Gaurav Chanana</td>
<td>What's in the Pipeline - Newer Drugs for the coming Decade</td>
<td>Dr. Naveen Malhotra</td>
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<td>Themed Session 20</td>
<td>Dr. Vandana Mangal</td>
<td>Moving towards Pain Management from Pain Treatment</td>
<td>Dr. Sameer Desai</td>
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<td>Pain to Pain-free state: Empowerment of a Chronic Pain Patient</td>
<td>Importance of Goal setting and Self Management Evidence Advances in the understanding of CRPS</td>
<td>Dr. Vishal Gunjal</td>
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<td>Cognitive Behavioural Therapy and Mindfulness</td>
<td>Dr. Dhruv Bibra</td>
<td>Distraction Techniques - Channelizing Energies of a Chronic Pain Patient</td>
<td>Dr. Kailash Waghmare</td>
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<td>Themed Session 12</td>
<td>Dr. Namrata Ranganath</td>
<td>Shoulder Joint Pain-what a Pain Physician Need to Know</td>
<td>Dr. Shovan Kumar Rath</td>
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<td>Joint Pain Facet to Knee: Disability to</td>
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<td>Knee Pain- Beyond Osteoarthritis</td>
<td>Dr. Varun Singla</td>
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<td>Dr. Jayashree Sood</td>
<td>Philosophy, Legal and Ethical aspects of pain medicine</td>
<td>Dr. Raghunath Rao</td>
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<td>Dr. N.S.Kodandaram</td>
<td>Building a successful pain practice</td>
<td>Dr. Athma Prasanna</td>
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<td>Validating Complimentary alternative medicine</td>
<td>Dr. Raghavendra Rao</td>
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<td>Examination of Cervical Spine</td>
<td>Dr. Manoj Shinde</td>
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<td>Examination of Lumbar Spine</td>
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<td>13:45 - 15:15 Hrs</td>
<td>Themed Session 18</td>
<td>Dr. Madhan Kumar</td>
<td>Pharmacological complications in Pain Practice</td>
<td>Dr. Debjyoti Dutta</td>
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<td></td>
<td>Complications &amp; Management: The Real Test of Experience</td>
<td>Dr. Roopesh Jain</td>
<td>Complications in Interventional Pain Management - Immediate and delayed</td>
<td>Dr. Karthic Babu Natarajan</td>
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<td>Coordinator: Dr. Anantha Balasubramaniam</td>
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<td>Prevention of Complications - Simulation Training, Consenting</td>
<td>Dr. Hammad Usmani</td>
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<td>Management of Complications Immediate and Delayed</td>
<td>Dr. Sunita Lawange</td>
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<td>15:15 – 15:30 Hrs</td>
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<td>15:30 – 16:45 Hrs</td>
<td>Themed Session 21</td>
<td>Dr. Rama Mani</td>
<td>Pain Syndromes in Cancer Patients</td>
<td>Dr. Seema Mishra</td>
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<td></td>
<td>Cancer Pain: Relevance to Details</td>
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<td>Psychosocial Aspects of Cancer Pain - Are we Giving Enough Attention?</td>
<td>Dr. Michelle Normen</td>
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<td>Coordinator: Dr. N.K.Vinod</td>
<td>Dr. Dwarkadas Baheti</td>
<td>Neurosurgical Treatment of Cancer Pain</td>
<td>Dr. Lakshmi Koyyalagunta</td>
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<td>Management of Refractory Pain in Cancer</td>
<td>Dr. Sunny Malik</td>
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### Day 3 | 03 Feb 2019, Hall A

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<td>09:30 – 11:00 Hrs</td>
<td>Themed Session 22</td>
<td>Dr. G.K. Manoj</td>
<td>Relavence of Neurolytic Interventions to Current Practice</td>
<td>Dr. Uttam Siddhaye</td>
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<td>The Selection of Patients and Relevant Preparation</td>
<td>Dr. Raghu Thota</td>
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<td>Role of Neurolytic Interventions - Selection Just as Crucial as Meticulous Execution</td>
<td>Dr. Jyotsna Goswami</td>
<td>Lumbar Sympathetic neurolysis - Past and Present</td>
<td>Dr. Sangeetha Das</td>
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<td>Coordinator: Dr. Ashok</td>
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<td>The Intraspinal Ablation Choice of Ablative Intervention</td>
<td>Dr. RPS Gehdoo</td>
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<td>11:15 – 12:45 Hrs</td>
<td>Themed Session 25</td>
<td>Dr. Gaurav N Goyal</td>
<td>Stem cell and Pain Management - The Love Story</td>
<td>Dr. Minal Chandra</td>
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<td></td>
<td>Regenerative Therapy/ CAM Principles in Chronic Pain</td>
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<td>Regenerative Medicine - New Paradigm</td>
<td>Dr. Apurv Mahalle</td>
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<td>Coordinator: Dr. Madhur Chadha</td>
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<td>Bone Marrow Concentrate and PRP Harvesting</td>
<td>Dr. Sorabh Garg</td>
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<td></td>
<td>Dr. Malvinder Saah</td>
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<td>What to Use? Important Question in Regenerative Medicine</td>
<td>Dr. Vaibhav Bola</td>
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<td>Dr. Dheeraj Dumir</td>
<td>Human Factors and Ergonomics</td>
<td>Dr. Arun</td>
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<td>Manual Therapy and its Application in Musculoskeletal Pain</td>
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<td>Role of Occupational Therapy in Chronic Pain</td>
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<td>Role of Patient - The Forgotten Team Member</td>
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<td>11:15 – 12:45 Hrs</td>
<td>Themed Session 26</td>
<td>Dr. D.C. Mahesh</td>
<td>Is pain in Children different?</td>
<td>Dr Praneet Singh</td>
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<td>Management of Chronic Pain in Children</td>
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<td>Unique Geriatrics Pain States</td>
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<td>Medications and Older Adults - Be Careful!</td>
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<td>Themed Session 24</td>
<td>Dr. Pradeep Jain</td>
<td>Future-Proofing our Pain Education - The Way Forward</td>
<td>Dr. Ashok Saxena</td>
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<td>Chronic Pain Education: Continuing the legacy</td>
<td>Dr. UmaMaheshwar Rao</td>
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<td>Dr. Nazeer Ahmed Kudligi</td>
<td>Pain Education for Medical Undergraduates: Challenges &amp; Opportunities</td>
<td>Dr. Ananth Prasad Rao</td>
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<td>11:15 – 12:45 Hrs</td>
<td>Themed Session 27</td>
<td>Dr. Sahajananda Hiremathada</td>
<td>Pain in Chronic Pancreatitis - Is There a Solution?</td>
<td>Dr. Nishad P.K</td>
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<td>Dr. B S Jagadish</td>
<td>Functional Abdominal Pain Syndrome</td>
<td>Dr. Vivek Chakole</td>
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<td>Post Operative Analgesia after Abdominal Surgery-an Update</td>
<td>Dr. Sumitra G Bakshi</td>
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<td>Refractory Angina - Role of Pain Physician</td>
<td>Dr. Prakash Deshmukh</td>
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CONFERENCE VENUE LAYOUT
NIMHANS CONVENTION CENTRE
WORKSHOP WRITE-UP
EVALUATION OF CHRONIC PAIN PATIENT
Dr. Pratibha Matche - Workshop Director

List of Speakers for the Session
Dr. Gautam Das
Dr. Ram Murthy Kulkarni
Dr. Ravi Shankar Sharma
Dr. Nishad P.K
Dr. Debjyoti Dutta
Dr. Palak Chavda
Dr. Samarjit Dey
Dr. Sunita Lawange
Dr. Varshali Keniya
Dr. Nupur Pruthi
Dr. Suryanarayana Sharma
Dr. Michelle Normen
Dr. Navita Purohit
Dr. Gurumurthy
EVALUATION OF CHRONIC PAIN PATIENT

Topic
PSYCHOLOGICAL EVALUATION

Workshop Director: Dr. Pratibha Matche

Date: 31st January, 2019

Background:
Inadequately managed pain can lead to adverse physical and psychological patient outcomes for individual patients and their families. The inability to get away from pain may create a sense of helplessness and even hopelessness, which may predispose the patient to more chronic psychological issues. The resultant behaviour when pain is managed inadequately often leads to unwillingness to seek medical care for other health problems (Wells N. t.al, 2008).

Psychosocial factors also play an important role in determining who develops chronic pain and how a given individual responds to pain in terms of functional status, adaptation, and development of disability (Pincus T.et.al, 2002). Some clinicians at times confuse psychological factors with psychiatric illnesses (e.g. depression, anxiety etc.). While psychiatric illnesses can accompany chronic pain or result from persistent pain, there is little evidence suggestive of psychiatric illnesses being the root cause of most chronic pain conditions (Campbell LC.et.al, 2003).

Therefore, in order to gain a holistic understanding of the patient who is undergoing chronic pain, information about pathophysiology (Bio), psychological (psycho) and social factors (social) need to be assessed and integrated for diagnostic purposes and treatment planning.

Objectives:
- Introduction of Psychology in Pain management
- Understanding the Bio-Psycho-Social Model of Pain
- Psychological assessments and interventions for understanding Pain
Topic - NECK PAIN

Introduction

Neck pain is one of the most common complaints of patients in pain clinic. Frequency of neck pain increased due to bad posture or jobs, which require prolonged flexion of the neck such as computer work or over the head work. The initial evaluation should be comprehensive in order to ascertain not only the etiology of physical symptomatology, but also the impact the patient's disability has on their psychosocial environment.

Etiology:

Apart from trauma, tumor, and infection, which are red flag, there are various causes of chronic neck pain that are given below.

Table 1: Causes of Neck pain.

<table>
<thead>
<tr>
<th>Causes of Neck pain</th>
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<tr>
<td><strong>1. Cervical spine</strong></td>
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<tr>
<td>1. facet joint arthropathy</td>
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<tr>
<td>2. internal disc disruption (IDD)</td>
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<td>3. prolapse intervertebral disc</td>
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<tr>
<td>4. cervical radiculopathy</td>
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<tr>
<td>5. vertebral fractures due to trauma</td>
</tr>
<tr>
<td>6. interspinous ligament sprain</td>
</tr>
<tr>
<td><strong>2. Myofascial pain syndrome (MFS)</strong></td>
</tr>
<tr>
<td>1. trapezius MFS (most common)</td>
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<tr>
<td>2. sternocleidomastoid MFS</td>
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<tr>
<td>3. occipitalis MFS</td>
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<tr>
<td><strong>3. Spondiloarthropathies</strong></td>
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<tr>
<td>1. Degenerative arthropathy</td>
</tr>
<tr>
<td>2. Rheumatoid arthritis (RA)</td>
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<tr>
<td>3. Ankylosing spondylitis</td>
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<tr>
<td><strong>4. Referred pain</strong></td>
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<tr>
<td>1. Shoulder joint</td>
</tr>
<tr>
<td>2. Heart</td>
</tr>
<tr>
<td>3. Lung</td>
</tr>
<tr>
<td>4. Diaphragmatic irritation</td>
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<tr>
<td>5. Abdominal pathology</td>
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<tr>
<td><strong>5. Others</strong></td>
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<tr>
<td>1. Postherpetic neuralgia</td>
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<tr>
<td>2. Diabetic polyneuropathy/mononeuropathy</td>
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<tr>
<td>3. Nerve entrapment syndromes, occipital neuralgia</td>
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<td>4. Brachial plexus neuropathy</td>
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<td>5. Complex regional pain syndrome</td>
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RED FLAGS:

Though chronic neck pain is commonly due to myofascial pain or facet joint arthropathy, red flags should be ruled out. As cervical canal is almost completely occupied by spinal cord, minor reduction in canal diameter will lead to cervical myelopathy, hence careful assessment is important to identify early signs of myelopathy. Occasional patients develop high spinal cord compression leading to quadriplegia, respiratory insufficiency, and death. Table 2 enlisted red flags in neck pain.
Table 2: Red flags in case of neck pain.

<table>
<thead>
<tr>
<th>Red flags</th>
<th>Diagnostic considerations</th>
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<tbody>
<tr>
<td>1. History of trauma.</td>
<td>Fracture leading to unstable spine.</td>
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<td>Cord compression.</td>
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<td></td>
<td>Myelopathy</td>
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<td></td>
<td>Vertebral body fracture.</td>
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<tr>
<td>2. Infectious history</td>
<td>Meningitis,</td>
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<tr>
<td>Fever, malaise, nuchal rigidity.</td>
<td>Epidural abscess.</td>
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<td>3. Tumor history</td>
<td>Cervical tumors</td>
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<td>Sudden weight loss, anorexia, night pain.</td>
<td>Metastatic lesions.</td>
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<td>SOL leading to cord compression.</td>
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<td>Vertebral compression fractures.</td>
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<tr>
<td>4. progressive disturbance of gait, progressive motor or sensory deficits, Bladder bowel incontinence.</td>
<td>Unstable spine leading to cervical myelopathy.</td>
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<td>5. Acute progressive neurologic and cognitive deficits accompanied by hemodynamic instability.</td>
<td>Dissecting vertebral artery aneurysms.</td>
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<td>Dissecting extra cranial carotid artery aneurysms.</td>
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<td>Cervical angina syndrome.</td>
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<td>8. History of Rheumatoid arthritis.</td>
<td>Morning stiffness &gt;30 mins, peripheral joints swelling and arthritis.</td>
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<td>Atlantoaxial dislocation.</td>
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<td>Fibromyalgia.</td>
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</table>

Detail history of patients.

The purpose of a thorough history with determination of the location, pattern, and distribution of the patient's pain is to establish an initial differential diagnosis that can subsequently be confirmed or ruled out by physical examination, diagnostic laboratory, radiologic, and electrophysiological testing.
Neck pain history.

1. Age of onset:

In pediatric and adolescent patients, trauma or sports injuries are common causes for neck pain. Congenital defects such as Chiari I malformations, short neck syndromes can also lead to neck pain in these age groups. In middle aged adults inflammatory arthritis such as rheumatoid arthritis, seronegative spondyloarthropathies like ankylosing spondylitis, psoriatic arthritis, and reactive arthritis should be considered in differential diagnosis. Degenerative changes are common in older patients.

2. Location of pain:

It helps us to know the underlying pain generator. Pain generators in joints and muscles are usually localized. Nerve root compression pain is dermatomally distributed and pain along the peripheral dermatomal and/or myotomal distribution suggests lesions of the cervical or brachial plexus or their branches. Axial neck pain is due to internal disc disruption, bilateral facet joint. Paramedial pain suggestive of facet joint and its referred pain, myofascial pain or other neck pathologies. Widespread pain can be seen in fibromyalgia, osteoarthritis, rheumatoid arthritis, SLE, hypothyroidism or somatization in severe depression. Infections and neoplasms can cause axial neck pain through bone destruction with irritation of vertebral body periostial nerves and altered biomechanics of the facet joints and cervical disks.

3. Radiation of pain:

Cervical and brachial referral patterns may be secondary to myofascial trigger points or referred pain from cervical facet joints. Pain commonly is referred from the shoulder, heart, lungs, viscera, or temporomandibular joint to the neck region owing to overlapping nerve distribution. Referred pain to the occiput usually indicates pathologic changes in the upper cervical spine and may radiate down the neck and to the ear. If the face, head, or tongue is involved, the upper three nerve roots of the cervical plexus may be affected. Numbness of the neck, shoulder, arm, forearm, or fingers indicates involvement of C5-T1. The referral area in cervical region is listed in Table 3.

Table 3: Cervical Pain Referral Pathways.

<table>
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<tr>
<th>location of pain</th>
<th>Source</th>
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<tr>
<td>Upper posterolateral cervical region</td>
<td>C0-1, C1-2, C2-3</td>
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<tr>
<td>Occipital region</td>
<td>C2-3, C3</td>
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<tr>
<td>Upper posterior cervical region</td>
<td>C2-3, C3-4, C3</td>
</tr>
<tr>
<td>Location of Pain</td>
<td>Source</td>
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<tr>
<td>Middle posterior cervical region</td>
<td>C3-4, C4-5, C4</td>
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<td>Lower posterior cervical region</td>
<td>C4-5, C5-6, C4, C5</td>
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<tr>
<td>Suprascapular region</td>
<td>C4-5, C5-6, C4</td>
</tr>
<tr>
<td>Superior angle of scapula</td>
<td>C6-7, C6, C7</td>
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<tr>
<td>Midscapular region</td>
<td>C7-T1, C7</td>
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</table>

4. Duration of pain:
Acute pain due to trauma, infection, disc prolapse with neurodeficit, vascular dissection with hemodynamic instabilities must be aggressively investigated and treated to avoid major complications and death. More gradual or insidious onset is common in progressive degenerative, inflammatory or malignant process.

5. Character of pain:

Pain due to musculoskeletal origin are generally dull, aching, deep, throbbing in nature, where as neuropathic pain are sharp, shooting, electric shock like with tingling and numbness. Nerve root involvement pain is dermatomally distributed and describes along these areas. Dermatomaly, C1 and C2 innervate the occiput region; C3 and C4, the nape of the neck; C5, the deltoid region; C6, the radial aspect of the forearm; C7, the long finger; C8, the ulnar border of the hand; and T1, the medial border of the arm. T2-T12 provide innervations to the chest and abdomen, with T4 being at the nipple line, T10 at the umbilicus, and T12 at the inguinal ligament. Articular symptoms arise from the facet and vertebral joints causing stiffness and localized pain. Poorly localized, burning pain characters are seen in sympathetically mediate pain. Hyperesthesia, alldynia and burning pain suggests Complex Regional Pain Syndrome (CRPS).

6. Progression of neuro deficits:

Any progression of sensory or motor dysfunctions due to nerve root or cord compression must be considered as red flags and treated accordingly. Myelopathy can be due to mass effect from a tumor or infection or instability owing to systemic arthritis or connective tissue disorders, but it is often a result of advanced degenerative changes within the cervical spine and large central PIVD. There can be bladder and bowel disturbances with loss of proprioception due to dorsal column compression leading to gait disturbance. Upper motor type of lesion in lower limb, described as stiffness in lower limbs and lower motor type of lesion in upper limb at the level above compression, described as weakness and looseness in upper limb.
7. Aggravating and relieving factors:

Pain due to spine involvement will be aggravated during movements. Facet joint pain will be aggravated by neck extension, lateral flexion and lateral rotation. Atlanto-occipital joints arthritis is worsened with provocative neck flexion and extension, whereas atlantoaxial arthritis is worsened with rotation. Discogenic pain will be more in forward flexion. Myofascial pain will be aggravated by muscle stretching and over tender points palpation. Radiculopathy pain will be relieved by arm abducted and externally rotated over head. Chronic inflammatory pain is often worse after a period of inactivity and improves with exercise. Degenerative arthritis is often exacerbated by exercise and improves with rest.

8. Associated symptoms:

Morning stiffness, polyarthritis, rigidity, skin manifestations are associated symptoms in inflammatory arthropathy. Rheumatoid arthritis often involves the cervical spine, initially causing stiffness and later causing pain. After the hands and feet, the cervical spine is the most common site of disease involvement in rheumatoid arthritis. Ankylosing spondylitis often affects the entire axial skeleton with early limitation of lumbar motion and chest expansion and later involvement of the cervical spine. Fever, night pain and weight loss suggestive of infectious etiology.

Dyspnea can be related to a deficit in the C3-C5 innervations of the diaphragm. Palpitations and tachycardia secondary to cervical spine pathology can be differentiated from other causes by the fact that these symptoms are associated with unusual positions or hyperextension of the neck. This hyperextension is caused by irritation of C4 innervation of the diaphragm and pericardium or by irritation of the cardiac sympathetic nerve supply. Drop attacks suggest posterior circulation insufficiency. Severe night pain, anorexia, progressive myelopathy is associated with malignancy.

Eye and ear symptoms may arise from irritation of the plexus surrounding the vertebral and internal carotid arteries. Eye symptoms can manifest with blurring of vision relieved by changing neck position, increased tearing, orbital and retro-orbital pain, and descriptions of eyes being “pulled backward” or “pushed forward.” Altered equilibrium with associated gait disturbances may result from irritation of the surrounding sympathetic plexus or from vertebral insufficiency. Hearing can be affected with tinnitus and altered auditory acuity. Throat symptoms, including dysphagia, may be related to anterior vertebral osteophytes causing direct compression and cranial nerve and sympathetic nerve communications.

Occupational history:

Jobs requiring hyperextension of neck for overhead work are prone for occipital neuralgia and cervicogenic headache due to upper cervical spine involvement, where as job requiring prolonged neck flexion such as computer work are prone for interspinous ligament sprain and lower cervical spine involvement.
Family history:

Various inflammatory and non-inflammatory arthritis such as rheumatoid arthritis, enclosing spondylitis, Reiter’s syndrome and psoriatic arthritis runs in a family and also tumors like schwannoma, neurofibromas compressing cervical cord seen in familial neurofibromatosis type 1\(^1\). Family history of diabetes, hypothyroidism will help to identify diabetic neuropathy and widespread pain.

Review of other systems:

For diagnosing referred pain from heart, lungs, abdomen, history regarding these systems’ involvement must be taken thoroughly. Angina can lead to referred neck pain with breathlessness on exertion, arrhythmias. In C6-C7 lesion pain and tenderness may be present in the scapular region or over precordium known as pseudoangina\(^3\). A pressure sensation is felt in the chest, which increases with exercise, radiates down the arm, is aggravated by neck movement, and may be associated with torticollis or muscle spasm in the neck. Differentiation of heart disease from symptoms associated with C6-C7 dysfunction is made on the basis of muscle weakness, fasciculations and sensory or reflex changes\(^6\). Pancoast tumor is a neoplastic process of the apical portion of the lung that can cause a mass effect on the caudal cervical nerve roots\(^3\). In these patients respiratory symptoms like chronic cough, hemoptysis or breathlessness will be present. Also respiratory infections can lead to cervical lymphadenopathy causing neck pain. Diaphragmatic irritation due to peritonitis due to infection or abdominal carcinoma will lead to referred pain to shoulder and neck.

Past trauma and surgical history:

History of accident with whiplash injury due to hyperextension followed by hyperflexion is significant as these injury in acute cases should be carefully evaluated for unstable fractures and cord compression. Mostly there is myofascial pain which will recover gradually. The prevalence of cervical facetogenic pain is high in the whiplash population\(^7\). Past history of trauma or nerve injury with pain more than inciting injury along with sympathetic and autonomic changes, CRPS can be present. Past cervical spine surgery, facet joints and disc above and below fixation are more prone for arthropathy and degeneration due to shifting of load.

Examination:

Clinical examination related to neck pain starts as soon as patient enters the room.

- **Gait** – It is normal when neck pain is due to local pathology not involving cord. In cervical myelopathy, trendelenberg gait, bilateral spastic, ataxic or spastic-ataxic gait can be present.
- **Body habitus** – Cancer patient will be cachexic. Patient with chronic infection will be thin built.
- **Higher functions** – Mood and affect are altered due to chronic pain and help us to know impact of pain on daily routine quality of life. Cognition is impaired in cancer, vascular dissection and hemodynamically unstable patients.
**Inspection:**

a. **Skin**- skin over neck and upper limb is inspected for post herpetic vesicular scaring which will be dermatomally distributed and do not cross midline in cases of post herpetic neuralgia. Psoriatic skin eruptions can be seen in psoriatic arthropathy. Signs of inflammation like erythema, swelling, redness can be present in local pathologies of neck.

b. **Head and neck posture** - Patient with neck pain tries to stabilize joint by surrounding muscle contraction to avoid movement aggravating pain. Observe the retention or loss of cervical lardosis. The patient may be splinting the neck with the head turned away from the injured muscle. This posturing of the neck is termed torticollis. The head is turned away from the side of the involved sternocleidomastoid.

c. **Shoulder symmetry** - In cases of shoulder pathologies or neck muscles contraction in myofascial pain, shoulder joints will be drooped or pulled upward.

d. **Muscle wasting** - Gross muscle wasting can be seen on inspection suggestive of motor nerve fiber involvement like brachial plexopathy. It will be present in both upper and lower limb in case on myelopathy.

**Palpation:**

It helps us to locate exact pain generators by eliciting local tenderness. Axial cervical spinous tenderness may be present in internal disc disruption, bilateral facet joint arthropathy where as interspinous tenderness in case of interspinous ligament sprain. Paramedian pain may be due to facet joint, myofascial or local infective source like lymph node. Table 4 shows various structures to be palpated anteriorly and posteriorly.

**Table 4: Palpation findings in a neck pain**,1,3.

<table>
<thead>
<tr>
<th>Anteriorly or anterolaterally.</th>
<th>B. Soft tissue palpation.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Bony structure.</strong> 1. Between the angle of the jaw and the styloid process- Transverse process of C1 2. At the level of the hyoid bone-C3-C4 facet joint. 3. At the level of the thyroid cartilage-C4-C5 vertebral body and facet joint. 4. At the level of the cricoid ring-C6 with carotid tubercle. 5. Head of first rib with 1st costochondal joint should be palpated for pain generator.</td>
<td>1. Thyroid gland swelling or nodule. 2. Cervicle lymph nodes enlargement due to infection or metastasis. 3. Sternocleidomastoid muscle for trigger and tender point.</td>
</tr>
</tbody>
</table>
**Posterior and posterolaterally.**

<table>
<thead>
<tr>
<th>A. Bony structures.</th>
<th>B. Soft tissue palpation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Occiput, inion, superior nuchal line, mastoid processes. Tenderness or pain with examination&lt;br&gt;3 cm from the midline over superior nuchal line may be seen with occipital neuralgia where greater occipital nerve lies and lesser occipital nerve lies over medial two third and lateral one third of line joining occiput and mastoid process.</td>
<td>1. Sub occipital muscles and trapezius muscle for myofascial trigger and tender points.</td>
</tr>
<tr>
<td>2. Facet joints are located&lt;br&gt;2-3 cm from the midline. Palpation of the lateral atlantoaxial joint of C1-C2 is undertaken by rotating the patient's head to the ipsilateral side.</td>
<td>2. Paraspinal muscles for stiffness.</td>
</tr>
<tr>
<td>3. C3, C4, C5 are difficult to palpate due to cervical lordosis and identified by anterior structure.</td>
<td>3. Inter spinous space for ligament sprain.</td>
</tr>
<tr>
<td>4. C7 has a largest spinous process and easily palpated.</td>
<td>4. Posterior group of lymph node for malignant metastasis or infection.</td>
</tr>
</tbody>
</table>

**Range of motion:**

It may reveal pain or limitations in flexion-extension, lateral bending, and rotation. Neck flexion occurs with 50% of the motion occurring at the occiput-C1 joint and the remaining 50% distributed over C2-C7. If the patient is unable to place the chin on the chest, the interval should be measured. One finger width shows a limitation of 10 degrees; three finger widths indicate a 30-degree limitation in flexion. Backward neck extension, the distance between the base of the occiput and T1 spinous process should be measured. Lateral flexion should allow the ear to touch the shoulder with motion being shared across all cervical vertebrae. On rotation, the chin should touch the shoulder with 50% of rotation occurring at C1-C2 and the remaining 50% distributed in the sub axial spine between C3-C7\(^1\). There is a natural decrease in range of motion with age, even in healthy individuals\(^8\). Range of motion tests the ligaments, capsules, and fascia, and this range of motion is reduced in the presence of cervical spinal muscular spasm or pain. Patients with degenerative changes of the cervical spine have pain with decreased range of motion of the cervical spine. The most common findings secondary to changes in the cervical spine articulations are (in order):
restriction of movement with or without pain, pain on movement, and local tenderness. Lateral flexion is the earliest and most impaired movement in degenerative diseases with rotation first impaired in rheumatoid arthritis owing to involvement of the odontoid peg. A uniformly stiff neck may be caused by diffuse idiopathic skeletal hyperostosis, which is present in a quarter of elderly patients, but also may be due to ankylosing spondylitis or recent trauma to the neck. If articular signs are found, the examiner must evaluate the entire vertebral column and peripheral joints for evidence of further arthritis and search for extra-articular manifestations. Causes of decreased range of motion of the cervical spine include joint locking and bony ankylosis from degenerative changes or arthritis, fibrous contractures, muscle spasm, splinting over painful joints, and nerve root or spinal cord compression or irritation.

Special tests and signs:

This tests change the diameter of the neural foramen, increasing or decreasing the symptoms.

a. Spurling maneuver- (fig 1) Passive lateral flexion and compression of head. Positive test is reproduction of radicular symptoms distant from neck. It also increases pressure on the cervical facet joints and may intensify facet mediated pain.

b. Shoulder abduction (relief) sign- (fig 2) Active abduction of symptomatic arm, placing patient's hand on head. Positive test is relief or reduction of ipsilateral cervical radicular symptoms.

c. Neck distraction test- (fig 3) Examiner grasps patient's head under occipital and chin and applies axial traction force for 30 to 60 seconds. Positive test is relief or reduction of cervical radicular symptoms. Increased pain with this maneuver may be due to inflammatory or degenerative disease, or muscle or ligamentous pathology.

d. Valsalva Test- (fig 4) This test is performed by having the patient place their thumb in their mouth and blow, as if to push the thumb out of their mouth. This maneuver increases the intraspinal pressure and may reveal the presence of space-occupying lesions of the cervical spine such as large intervertebral disc herniations, tumors, and stenosis due to spondylosis or osteophytes. If the mass involves the area of the spine adjacent to nerve roots, radicular pain may be reproduced.
e. **Jackson’s compression test**-(fig 5 & 6) The patient is instructed to rotate his or her head first to the right and then to the left. The examiner exerts gentle pressure to the top of the patient's head after each movement. This test places increased pressure on the cervical facet joints and causes narrowing of the neural foramen and reproduce neck pain due to facet arthropathy and/or upper extremity radicular pain due to nerve root compression¹.

f. **Lhermitte’s sign**-production of paraesthesias or dysesthesias in the arms or legs upon flexion of the cervical spine. It may be caused by a large disc herniation or bony compression of the anterior cord in patients with a narrowed central canal. It may also occur in patients with rheumatoid arthritis with associated instability or in patients with multiple sclerosis affecting the cervical spinal cord, tumors, and syringomyelia¹. This indicates changes in the white matter of the spinal cord and may be secondary to cervical myelopathy or multiple sclerosis³.

g. **Adson’s maneuver**-(fig 7) This test is used to rule out compression of the subclavian artery by an extra cervical rib or scalene muscle bands, which may result in thoracic outlet syndrome. The patient’s arm hangs at their side and the head is extended and rotated toward the affected side. The patient is then instructed to breathe deeply and hold their breath while the radial pulse is monitored. The test is considered positive if the radial pulse disappears¹.

h. **Grip-release test**- is an inability to open and close a fist rapidly because of weakness and spasticity of the hand.

**Sensory examination:**

Light touch, pressure sense, pin prick along with temperature and proprioception should be done in both upper limbs for comparisons in case of radiculopathy, CRPS, peripheral neuropathy and in all four limbs in case of myelopathy. Progressive sensory loss is considered as red flag.

**Motor examination:**
Motor functions are tested as per standard grading 0 to 5, with grade 0 having no function, 1 having trace, 2 having full range of joint motion with gravity eliminated, 3 having antigravity function, 4 having function against slight resistance, and 5 having normal strength against resistance. Progressive decreasing motor grading or grade 3 or less is a red flag. Lower motor neuron disease is indicated by weakness, hypotonia, and fasciculations. Upper motor neuron disease is indicated by spasticity.

Reflexes:

Deep tendon stretch reflexes should be performed and graded 0 to 3 with 0 being no response, 1 being hyporeflexive, 2 being normal, and 3 being hyperreflexive. To facilitate reflex testing, it may be helpful to use muscle loading or Jendrassik's maneuver (performed by having the patient flex both sets of fingers into a hook-like form, interlocking the hands, and pulling apart). This maneuver creates a diversion to help relax the patient and assess lower extremity reflexes. If difficulty with reflex testing persists, the clinician should ensure that no peripheral neuropathy is present.

a. Bicep's reflex- (fig 8) C5 is tested by striking the biceps tendon with elbow flexed.

b. Supination reflex- (fig 9) C6 mediated and tested with elbow semi flexed with forearm midpronated by striking over brachioradialis tendon over radial tubercle.

c. Triceps reflex- (fig 10) C7 mediated and tested with elbow flexed and triceps tendon is struck above olecranon process.

d. Babinski's test is performed by stroking the lateral plantar aspect of the foot with a pathologic response indicated by an up-going great toe indicating an upper motor neuron lesion.

Lower limb reflexes, knee and ankle reflex should be checked in case of myelopathy in which they will be exaggerated due to upper motor neuron lesion, where as upper limb reflexes will be diminished due to lower motor neuron lesion.
Other systemic examination-

a. **Cardiovascular**- To rule out referred pain of angina in neck cardiovascular examination must be carried out thoroughly. Blood pressure, pulse rate, heart rate, rhythm must be evaluate.

b. **Respiratory**- Pancost tumor of lung apex causes lower brachial plexus invasion and neck pain and plexopathy and diaphragmatic involvement can cause referred neck pain. Respiration rate, pattern and lung field auscultation helps to rule out lung pathologies.

c. **Abdominal**- Palpation of abdominal organs for enlargement and infection.

**Diagnostic algorithms of neck pain** :

**Algorithm 1.**

MFS-myofascial pain snydrome, FJA-facet joint arthropathy, IDD-internal disc disruption, PIVD-prolapsed intervertebral disc, PHN-post herpetic neuralgia, DMP-diabetic mononeurapathy, CRPS-complex regional pain syndrome.
Algorithm 2:

MFS-myofascial pain syndrome, FJA-facet joint arthropathy, GON-grater occipital nerve, LON-lesser occipital nerve.

Investigations:

1. **Routine blood investigation with ESR and CRP**- It should be advice in all cases suspecting of inflammatory arthropathy.

2. **X-ray AP and lateral view**- Bony changes are well recognized by X-rays, hence can identify fractures, degenerative osteophytes and cervical rib.

3. **CT scan**- Bony abnormalities, hemorrhage can be seen well with CT scan and advice in trauma cases, facet joint, uncovertebral joint abnormalities.

4. **MRI**- Soft tissue like disc, nerve root, canal diameter, muscles, vascular aneurysm and abnormalities are best seen in MRI.

**Diagnostic blocks**- It helps in finding pain generators. Various blocks can be performed and are evidence based. More than 50% pain relief is considered positive.

- a. Occipital nerve block-In case of occipital neuralgia but can be positive in migraine and tension type headache.
- b. Medial branch block-For facet joint arthropathy.
- c. Cervical interlaminar epidural injections-In case of radiculopathy and prolapsed disc.
d. Trigger point injections in myofascial pain syndrome.

e. Stellate ganglion block in case of CRPS.

5. **EMG and NCV**- These studies will be abnormal when nerves are involved, specially larger fibers and abnormal in radiculopathy and nerve entrapment syndromes. In CRPS, these studies are usually normal.

6. **Ultrasound neck and shoulder**- done when muscles or tendon tear are suspected.

**REFERENCES:**


5. Crockard HA ; Surgical management of cervical rheumatoid problems. Spine; 1995; 20:2584-2590


Topic - EXAMINATION OF LOW BACK PAIN
By Dr Sunita Lawange
& Dr Varshali Keniya

IASP defines Low back pain as lumbar or sacral spinal pain with or without leg pain. Lumbar Spinal pain or Low back pain as pain perceived anywhere within a region bounded by last thoracic spinous process, the first sacral spinous process and the lateral border of erector spinae. The sacral spinal pain is the pain perceived anywhere in a region bounded by first sacral spinous process, posterior sacrococcygeal joints and the PSIS. It is one of the most common complaints to seek medical care as an adult in a primary care setting. An accurate history and clinical examination are essential to locate the possible pain generators. The major causes of back pain are Facet joint arthropathy 15-45%, Interval disc disruption 25-40%, Sacroiliac joint arthropathy 15-30%, Disc prolapse/herniated disc/ slipped disc- 2-5%, CRPS/ RSD 2-8%, Osteoporotic compression fracture 3-5%, Fibromyalgia and myofascial pain 2-5%, Spinal canal stenosis 2-3%, Spondylolysis 2-3%, Tumor, Infection, FBSS and others < 1%

The pain generators of lower back:
- Disc- Degenerative, Disc herniation, Discitis
- Bone- Canal stenosis, Malignancy, Spondylolysis, Infection, Vertebal Fracture, Spondylolisthesis,
- Nerve- Neuropathies
- Muscle/soft tissue- MPS, Kyphosis/Scoliosis
- Joints-Facet arthropathy, Sacroiliac joint arthritis
- Mixed- Fibromyalgia, CRPS, Infection, Malignancy
- Referred pain – from major viseras, retroperitoneal structures

HISTORY
Right clinical diagnosis and focused pain management depends more on proper evaluation of the patient which included detailed history and clinical examination
Duration of pain
Site of pain
Radiation of pain from low back,
Quality of pain
Aggravating and relieving factors
Referred pain
Psychological assessment

Red flags are certain clinical features which may point toward the presence of a clinical condition which requires immediate further investigations and multidisciplinary approach for its management:
- Trauma
- Tumor
- Infection
- Neurological deficit
- Cauda equine syndrome
- Severe debilitating pain not getting relieved with conservative management

Yellow Flags
- Presence of yellow flags means the pt needs psychiatric evaluation:
  - Avoidance of normal activity due to fear that pain may increase
  - Use of extended rest
  - Belief that work is harmful
  - Avoiding rehabilitation
Depression, irritability, anxiety, Disinterest in social activity.

Clinical Examination

Inspection

1. **GAIT:** Free walking, toe and heel walking, antalgic gait, steppage gait
2. **POSTURE**
3. Look for tremors or other involuntary movements.
4. Examination of Spine: Asymmetry or deformity. For eg- localized angular deformity is seen in case of Pott’s disease. A step deformity of the spinous process may indicate a spondylolisthesis.
5. Look for muscle wasting, hypertrophy and joint malalignments. Muscle wasting can be because of motor neuron disease, disuse atrophy, cachexia, peripheral nerve section, primary disease of muscle itself.
6. Fasciculations are more typical of motor neuron disease.
7. **SKIN:** quality and colour, any swelling, presence of scar which can be a source of neuroma, PHN lesions.

Palpation

Localized tenderness- SIJ and Facet joint pain, Disc pathology

Local rise of temperature, swelling, allodynia, hyperalgesia- CRPS

Cold extremity along with discoloration – Raynaud’s disease, Berger’s disease

Look for Trigger points and Tender points

Evaluation of the motor system

a. Muscle bulk
b. Muscle strength
c. Muscle tone

a. Muscle bulk: It is assessed by comparing the symmetry of the proximal and the distal muscle.
b. Muscle strength: ask the patient to actively move the muscle against resistance. Compare the affected side with the normal side. The following is an arbitrary scale which is commonly used to grade the strength of the muscle.

<table>
<thead>
<tr>
<th>Grades of muscle strength</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grade 0</strong></td>
</tr>
<tr>
<td><strong>Grade 1</strong></td>
</tr>
<tr>
<td><strong>Grade 2</strong></td>
</tr>
<tr>
<td><strong>Grade 3</strong></td>
</tr>
<tr>
<td><strong>Grade 4</strong></td>
</tr>
<tr>
<td><strong>Grade 5</strong></td>
</tr>
</tbody>
</table>

c. **Muscle tone:** Tone can be defined as the slight residual tension in a voluntarily relaxed muscle. It is assessed by resistance to passive movement.
d. Clonus: Grasp the foot and passively dorsiflex and plantarflex it several times, ending with dorsiflexion of the foot. If a sudden rhythmic involuntary dorsiflexion and plantar flexion occur, ankle clonus is present. This frequently occurs in conditions of increased tone.

**SENSORY SYSTEM TESTING**

**Pain**

**Temperature**

**Tactile sensibility**

**Vibration**

**Position sense**

---

**Muscle tested with nerve supply and root value**

<table>
<thead>
<tr>
<th>Action</th>
<th>Muscle group</th>
<th>Nerve supply</th>
<th>Root value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hip Flexion</td>
<td>Iliopsoas</td>
<td>Femoral nerve</td>
<td>L1-L3</td>
</tr>
<tr>
<td>Hip extension</td>
<td>Gluteus maximus</td>
<td>Inferior gluteal nerve</td>
<td>L5, S1, S2</td>
</tr>
<tr>
<td>Hip Adduction</td>
<td>Adductors of Hip (Adductor longus, magnus, brevis)</td>
<td>Obturator nerve</td>
<td>L2-L4</td>
</tr>
<tr>
<td>Hip Abduction</td>
<td>Gluteus medius, minimus, tensor fascia lata</td>
<td>Femoral nerve</td>
<td>L4, L5, S1</td>
</tr>
<tr>
<td>Knee Flexion</td>
<td>Hamstrings</td>
<td>Sciatic nerve</td>
<td>L5, S1, S2</td>
</tr>
<tr>
<td>Knee extension</td>
<td>Quadriceps</td>
<td>Femoral nerve</td>
<td>L2 - L4</td>
</tr>
<tr>
<td>Ankle dorsiflexion</td>
<td>Tibialis anterior</td>
<td>Deep peroneal nerve</td>
<td>L4, L5</td>
</tr>
<tr>
<td>Plantar flexion</td>
<td>Gastrocnemius, soleus</td>
<td>Tibial nerve</td>
<td>S1, S2</td>
</tr>
<tr>
<td>Dorsiflexion of great toe</td>
<td>Extensor Hallucis longus</td>
<td>Deep peroneal nerve</td>
<td>S1, S2</td>
</tr>
<tr>
<td>Eversion of foot</td>
<td>Peroneus longus and brevis</td>
<td>Superficial peroneal nerve</td>
<td>L5, S1</td>
</tr>
</tbody>
</table>
Reflexes: Two Main Types

Deep Tendon Reflexes:
They are graded as
0 No response
1+ Diminished
2+ Normal
3+ Increased
4+ Hyperactive

Knee jerk (L2,3,4): With the patient supine, flex the knee to be tested at right angle and place your hand under the knee and strike the patellar tendon midway in between its origin and insertion. Look for the contractions of the quadriceps muscle and extension at the knee.

Ankle reflex (S1,2): Dorsiflex the ankle and strike the Achilles tendon just above its insertion on the posterior aspect of the calcaneus with the hammer. The result is plantar flexion at the ankle.

Superficial Reflexes:

Cremasteric Reflex: is elicited by lightly stroking the inner aspect of the thigh with an applicator stick or tongue depressor. The result is a rapid elevation of the testicle on the same side.

Plantar Reflex (L5, S1): the lateral aspect of the sole is stroked with a key from the heel to the ball of the foot and curved medially across the heads of the metatarsal bones, normally there is plantar flexion of the big toe. In pyramidal tract disease, there is dorsiflexion of the big toe, with fanning of the other toes. This is Babinski’s reflex.

Anal Reflex (S3,4) Gently scratch the skin on either side of the anus. A brisk contraction of anal sphincter occurs.

Classification of the two motor neuron diseases on the basis of above examination.
Upper motor neuron lesions produce spasticity, hyperreflexia, clonus, and Babinski’s sign.
Lower motor neuron lesions produce atrophy, fasciculations, decreased tone, and hyporeflexia.

Range of Motion of lumbar Spine:
The normal range of movements is described below and we should look for any restriction in doing them.
Flexion: Normal ROM 40 degrees
Extension: Normal ROM 15 degrees
Lateral bending: Normal ROM 35 degrees
Rotation: Normal ROM 40 degree

SPECIAL TESTS
Tests for Lumbar nerve root irritation

1. The Laségue Straight Leg Raising (SLR) Test: the patient is placed in the supine position with the unaffected leg flexed to 45 degrees at the knee and the affected leg placed flat against the table. With the ankle of the affected leg placed at 90 degrees of flexion, the affected leg is slowly raised toward the ceiling with the knee fully extended. The test is considered positive if the patient complains of pain and paresthesia into the affected extremity that are similar to the pain that the patient is suffering from. If this maneuver reproduces the patient’s pain, the test may be considered positive (Fig. 1).

Fig. 1 Laségue SLR test
2. **The Sitting Straight leg raising test**: this test is considered to be more accurate than the SLR test. The patient is placed in the sitting position and asked to kneel forward to increase the tension on the lumbar nerve roots. With the ankle of the affected leg in 90 degrees flexion, the affected leg is slowly raised towards the ceiling with the knee fully extended. The test is positive if the patient experiences pain and paresthesia in the affected limb. False +ve results may be observed in cases with tight hamstrings (Fig. 2).

3. **The Flip test**: for lumbar root irritation the patient is asked to sit on the side of the examination table with his hands resting on the edge of the table. The examiner lifts the foot and extends the leg. If patient is suffering from significant lumbar root irritation, he will flip backwards to relieve the tension on the affected lumbar nerve roots (Fig. 3).

4. **Buckling knee test**: the patient is placed in supine position with the unaffected leg flexed to 45 degrees at knee. The affected leg is slowly raised towards the ceiling with the knee fully extended. The test is positive if patient complains of pain and paresthesia into the affected extremity and involuntarily withdraws the affected limb to reduce the tension on irritated nerve roots.

5. **The Ely test**: the patient is placed prone and asked to flex the affected knee towards the buttock and then asked to lift the chest off the examining table to extend the back. The test is considered positive if this maneuver reproduces the pain (Fig. 4).

**Tests for Sacroiliac joint pain** the SIJ tests are the pain provocation tests which stress the SIJ structures and provoke the usual pain of which the patient complains.

1. **FABER / Patrick Test**: FABER is an acronym which checks for the limitation of pain of flexion, abduction and external rotation. To perform FABER test the patient is placed in the supine position and the hip and the knee is flexed to 90 degrees. The examiner then asks the patient to place the foot of his affected extremity on the opposite knee. The thigh is then slowly abducted and externally rotated towards the examination table. The test is considered positive if the patient complains of groin pain or spasm or the examiner identifies limited range of motion of hip (Fig. 5).
2. **The Distraction test**: with the patient in supine position the examiner applies a posteriorly directed force to both ASIS resulting in distraction of the anterior aspect of the SIJ (Fig.6)

Fig.6 Distraction test

3. **Sacral thrust test**: with patient in prone position the examiner applies force vertically downwards to the center of the sacrum. The presumed action is an anterior shearing force of the sacrum on both ilia (Fig.7)

Fig.7 Sacral thrust test

4. **Compression test**: the patient lies on the side with hips and knees flexed to a right angle. The examiner applies a force vertically downwards on the uppermost iliac crest resulting in a compression force to both SIJs (Fig.8)

Fig.8 Compression test

5. **Gaenslen’s test**: the patient lies supine near the edge of the table, one leg hangs over the edge of the table and the other hip and knee are flexed towards the patient’s chest. Firm pressure is applied to the knee flexed to the chest and counter pressure is applied to the hanging knee towards the floor. The procedure is carried out on both sides. The presumed action is a posterior rotational force to the SIJ of the flexed hip and knee and an anterior rotation force of the SIJ on the side of hanging leg (Fig.9)

Fig.9 Gaenslen’s test

**Test for Piriformis Syndrome**

1. **Freiberg maneuver**: The patient is asked to lie down supine and the extended thigh is forcefully rotated innerwards. The test is considered positive if buttock pain is elicited due to stretching of piriformis muscle (Fig 10)

Fig.10 Freiberg’s maneuver
2. **Pace Sign/FAIR Test:** The FAIR (flexion, adduction and internal rotation) test may be performed with the patient in a lateral recumbent position with the affected side up, the hip and knee flexed to 90 degrees. While stabilizing the hip, the hip the examiner internally rotates and adducts the hip by applying downward pressure to the knee, the FAIR test is presumed positive if sciatic symptoms are recreated (Fig. 11).

![Fig. 11 FAIR test](image)

3. **The Beatty test:** the patient lies on the unaffected side and asked to lift and hold the superior knee approximately 4 inches off the examination table. Patient tries to abduct the involved thigh upward. The abduction causes deep buttock pain in patient with piriformis syndrome and back pain in patients with Lumbar disc lesions (Fig 12).

![Fig. 12 The Beatty test](image)

**Facet Loading Test:** In the standing position patient is asked to hyperextend his back and to rotate it on either side. Rotation towards the affected side elicits the pain at a particular area on the back due to stretching of facet joint capsule.

**Stoop test for Canal Stenosis**
Stoop test: the patient is asked to walk briskly for 2-3 minutes until the threshold distance is identified. The patient is asked to walk further for 30 seconds and then to sit down upright in a straight back chair. The patient is then asked to lean forward. The stoop test is positive if the pain is relieved hence confirming the diagnosis of canal stenosis.

In case of radicular pain follow the dermatomal distribution

### Symptoms and signs of single nerve root lesion

<table>
<thead>
<tr>
<th>Root</th>
<th>Pain distribution</th>
<th>Dermatomal</th>
<th>Weakness</th>
<th>Affected reflexes</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>Inguinal region</td>
<td>Inguinal region</td>
<td>Hip flexion</td>
<td>Cremasteric</td>
</tr>
<tr>
<td>L2</td>
<td>Inguinal region and anterior thigh</td>
<td>Anterior thigh</td>
<td>Hip flexion, hip adduction</td>
<td>Cremasteric</td>
</tr>
<tr>
<td>L3</td>
<td>Anterior thigh and knee</td>
<td>Distal anteromedial thigh including knee</td>
<td>Knee extension, hip flexion, hip adduction</td>
<td>Patellar</td>
</tr>
<tr>
<td>L4</td>
<td>Anterior thigh and medial aspect leg</td>
<td>Medial leg</td>
<td>Knee extension, hip flexion, hip adduction</td>
<td>Patellar</td>
</tr>
<tr>
<td>L5</td>
<td>Posteromedial thigh, lateral leg, medial foot</td>
<td>Lateral leg, dorsal foot, great toe</td>
<td>Dorsiflexion of foot/toes, knee flexion, hip extension</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>Posterior thigh and leg, lateral foot</td>
<td>Posteromedial leg, lateral aspect of foot</td>
<td>Plantar flexion, foot/toes, knee flexion, hip extension</td>
<td>Achilles</td>
</tr>
</tbody>
</table>
CONCLUSION:
Always rule out the red flags from the history itself as they require immediate treatment. Thorough history and clinical examination along with investigations and diagnostic interventions give us important clues to in framing right provisional diagnosis and hence appropriate treatment for a prolonged period.

REFERENCES:

5. Physical diagnosis of pain : second edition by Dr. Steven D. Waldman.
Topic - Examination guide to a patient with Knee joint pain

The knee joint is the largest and complex joint because of the fusion of three joints i.e medial and lateral femorotibial and femoropatellar joint. It is a Synovial hinge joint with various articular surfaces and ligaments. Nerve supply to knee joint is via Femoral, Sciatic and Obturator nerves.

General Approach to the Patient with Knee Pain and clues from the history:

1) **Rule out Red flags**¹ ² -
   a) An acutely effused knee with history of trauma: fracture must be ruled out
   b) A red, hot knee joint, consideration must be given to septic arthritis.
   c) Patients with systemic symptoms or multi joint involvement. These patients are likely to have a systemic condition and should be appropriately evaluated

2) **History of knee pain**² :

A thorough history plays a very important in determining the etiology of knee pathology.

a) Main symptoms – Pain / Swelling
b) Mechanical – Gelling / Locking / Pseudolocking / Popping – / Buckling / Crepitation

3) **Examination**³ ⁴ ⁵ :

Examination Evaluation of knee requires complete exposure of the involved knee as well as the other knee for comparison.

- Inspection
- Palpation
- Range of motion
- Special maneuvers / Tests

General Observation: posture and movement patterns has to be noted

**Inspection:**

a) Effusion
b) Poor Alignment
c) Muscle Wasting

**Palpation:**

a) MCL ( medial collateral ligament)
b) LCL ( Lateral collateral ligament)
c) Joint Line
d) Patella
e) Patellar Tendon
f) Hamstrings Tendons
g) Popliteus.

**Range of Motion:**

a) AROM, PROM, and Overpressure
b) Muscle Strength and length
c) Clear hip and ankle with full AROM + overpressure
d) If lumbar spine suspected add passive intervertebral mobilisations (PA spinous processes, PA transverse processe
Neurological Examination:

Dermatome examination - L1 to S4

Myotome examination –

a) L2 Hip Flexion
b) L3 Knee Extension
c) L4 Dorsiflexion
d) L5 Big Toe Extension OR 4 Lesser Toes Extension
e) L5/S1 Knee Flexion
f) S1 Plantarflexion OR Foot Eversion
g) S2 Toe Flexion

Reflexes:  a) Patella Ligament (L3/L4)

b) Achilles Tendon (S1/S2)

Special tests:

ACL -

1. Lachman’s Test
   It is the most sensitive test to detect ACL injury. Patient lies supine on the bed. Place the patient’s knee 20-30 degrees flexion. The leg should also be slightly externally rotated. The examiner should place one hand on tibia and the other hand on thigh. Place the thumb on tibial tuberosity. Now on pulling the tibia anteriorly an intact ACL would prevent anterior translation of tibia on femur.

2. Anterior drawer
   The patient lies supine with hip flexed at 45 degrees and knee flexed at 90 degrees. The examiner sits on the toes of patient to stabilize the leg. Then the examiner grasps the proximal lower leg just below the tibiofemoral joint line and attempts to translate the lower leg anteriorly. The test is considered positive if there is a lack of end feel or excessive anterior translation relative to the contralateral side.

3. Pivot-Shift
The patient lies supine with the leg relaxed. The examiner grasps the heel of the involved leg with examiner’s opposite hand placed laterally on the proximal tibia. The examiner then applies valgus stress and axial load while internally rotating the tibia as the knee is moved into flexion from the fully extended position. A positive test is indicated by subluxation of the tibia while the femur rotates externally followed by a reduction of the tibia at 30-40 degree of flexion.

**PCL**

1. **Sag sign**
   Patient lies supine. Patient’s involved leg is placed with hip 45 degrees flexion and knee 90 degrees flexed. Look for tibia to ‘sag’ compared to the position of femur.

2. **Posterior Drawer**
   The patient is supine and the knee to be examined is placed 90 degrees flexion. The examiner sits on toes to stabilize it. The examiner grasps the tibia approximately at joint line and attempt to translate it posteriorly. The test is positive if there is a lack of end feel or posterior translation.

**MCL/LCL**

Valgus stress test and varus stress test
The patient lies supine. The leg hangs off the table. Knee is stabilised on examiner’s knee. Knee is flexed at 30 degrees to isolate the collateral ligament from the stabilizing force of PCL. Fix the thigh with one hand. Give varus stress (medial collateral) and valgus stress (lateral collateral). Test is considered positive if there is ligamentous laxity or pain in giving valgus or varus stress.
Meniscus

1. McMurrays
The patient lies supine. Both hip and knee flexed at 45 degrees. One hand grasps the ankle and other hand grasps the knee such that it lies on the joint line above the meniscus. To test medial meniscus valgus stress to flexed knee is applied. Ankle is externally rotated. Knee is extended slowly maintaining valgus stress to it. Lateral meniscus is assessed in the same way with varus stress and internal rotation of ankle.
Pain on medial/lateral joint line palpation is elicited in meniscal injury.

2. Joint line tenderness

3. Apley’s Test
Place the patient in prone position with knee flexed at 90 degrees. The patient’s thigh is then rooted to the examining table with the examiner’s knee. The examiner rotates tibia laterally and medially, combined first with distraction while noting any excessive movement, restriction or discomfort. The process is then repeated using compression instead of distraction.

\[
\text{ROTATION+DISTRACTION PAINFUL = LIGAMENTOUS INJURY} \\
\text{ROTATION+COMPRSSION PAINFUL = MENISCAL INJURY}
\]
4. **Steinman Test**  
This maneuver is essentially passive ROM with the examiner palpating joint line. Patient ies supine with knee and hip flexed 90 degrees. Examiner palpatates around knee joint line and does flexion and extension of knee while palpating joint line.  
Pain with movement and crepitus= meniscal lesion.

**Patellofemoral**

- **Grind Test (Clarke’s sign)**  
Patella grasped between thumb and forefinger, patella is moved up into the trochlear groove against contracted quadriceps. Crepitus may be felt if present.

**References**

Topic - Physical examination of Shoulder, Elbow and Wrist
Dr. Debjyoti Dutta and Dr. Nishad.P.K

Physical examination has been divided into 4 parts
a) Examination of shoulder
b) Examination of wrist
c) Examination of elbow
d) Neurological examination of upper limb

CLINICAL EXAMINATION FOR PAINFUL SHOULDER

Shoulder pain causes substantial impact on quality of life is also substantial.
History, clinical examination and relevant investigations are essential for reaching the diagnosis.
Red flags signs for shoulder pain are -
- Tumour, Infection
- Acute rotator cuff tear
- Unreduced dislocation
- Unexplained significant sensory and motor deficit.
- Vascular compromise.

Important points in clinical examination –
1. Age - Instability more common in age less than 35 yrs.
2. Trauma - Any significant history of trauma or any strenuous activity should be asked
3. Pain history – Detailed history of pain, nature character, intensity, aggravating and relieving factors should be asked.
4. Location –
   Anterolateral shoulder - impingement syndrome and the various stages of rotator cuff tendinopathy
5. Activities that exacerbate symptoms
6. Neck pain, thoracic pain, or other radiating pain in upper limb
7. Neuropathic pain symptoms like tingling and numbness along with pain.
8. Other joints involvement.
9. Fever, weight loss, rash and respiratory symptoms should be enquired.
10. Inspection -
    Muscle wasting and atrophy,
    Abnormal swelling, deformity (dislocations), scars,
    Ecchymosis & venous distension,
    Atrophy of the supraspinatus or infraspinatus suggestive of rotator cuff tear, suprascapular nerve entrapment or neuropathy,
    Scapular “wiring,”- shoulder instability and serratus anterior or trapezius dysfunction.

11. Palpation - tenderness and deformity. Specific localized tenderness will aid us in diagnosis.
12. Range of motion should be assessed for forward flexion, isolated abduction, horizontal adduction, external and internal rotation with arm at 0º, and external and internal rotation with the arm in abduction.
13. Apley’s scratch test can be used to test range of motion.
### Apley's Scratch Test

**Purpose**
Tests for limitations in motions of the upper extremity. Each motion is performed bilaterally to compare.

<table>
<thead>
<tr>
<th>Description</th>
<th>Action 1: Touch the opposite shoulder with his/her hand</th>
<th>Action 2: Place his/her arm overhead and reach behind the neck to touch his/her upper back.</th>
<th>Action 3: The subject puts his/her hand on the lower back and reaches upward as far as possible</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This motion checks Glenohumeral adduction, internal rotation, horizontal adduction and scapular protraction.</td>
<td>This motion checks Glenohumeral abduction, external rotation and scapular upward rotation and elevation.</td>
<td>This motion checks Glenohumeral adduction, internal rotation and scapular retraction with downward rotation</td>
</tr>
</tbody>
</table>

14. Passive horizontal adduction and abduction can exacerbate pain in acromioclavicular joint pathology.

15. **A painful arc between 70 to 120 degrees abduction is seen in subacromian pathology**

16. If the patient have painful restriction movement, difference between passive motion and active motion should be noted.
   
   *Glenohumeral problems will limit both active and passive motion* in forward elevation, internal rotation, and external rotation.
   
   *Impingement syndrome and rotator cuff tears will limit the patient’s active motion, but the passive motion.*

17. **Empty Can Test** - to assess the supraspinatus muscle and tendon - The patient's arm should be elevated to 90 degrees in the scapular plane, with the elbow extended, full internal rotation, and pronation of the forearm. This results in a thumbs-down position, as if the patient were pouring liquid out of a can. The therapist should stabilize the shoulder while applying a downwardly directed force to the arm, the patient tries to resist this motion. This test is considered positive if the patient experiences pain or weakness with resistance.

18. **Belly Press Test for Subscapularis tear** – (Sensitivity: 40%, Specificity: 98%)
   Patient in sitting/standing posture with hand of the affected arm placed on the belly. Patient exerts pressure on the belly with the hand until maximal internal rotation.
   Positive test - The patient feels weakness and cannot maintain maximal internal rotation.

19. Special tests

   Impingement tests
   - Neer’s test
   - Hawkin’s – Kennedy test

   Rotator cuff tests
   - Drop arm test
   - External rotation lag sign

   Instability tests
   - Apprehension test
Relocation test
Anterior release test

Acromioclavicular [AC] tests
O’Brien test.
AC Joint tenderness test.

Bicipital tendinitis tests
Speed test.
Yergason test.

Examination of wrist

A. Inspection; Observe both hands at the same time for:
   - **Asymmetry**
   - Telescoping or shortening of phalanges (psoriatic arthritis)
   - Inspect the fingers and wrist for any swelling or rubor (suggestive of inflammatory or infectious process)
   - **Deformities**
     Pitting, spooning, Ulnar deviation of fingers and wrist, swan-neck deformity, distal intraphalangeal joint hyper flexion with proximal interphalangeal joint hyperextension (rheumatoid arthritis)
   - **Nodules**
     Degenerative changes include Heberden (on the distal interphalangeal joints) and Bouchard’s nodes (on the proximal interphalangeal joints) of the fingers.
   - **Color changes**
     Look for atrophy of thenar muscles which occurs in median nerve lesions
   - Atrophy of hypothenar muscles occurs in ulnar nerve lesions.
   - Thickening of plamar fascia (Dupuytren’s contracture)

B. Palpation
   - Dorsal surface of wrist is palpated for synovial thickening, swelling, effusion, occurs in inflammatory or infectious process.
   - Tendons of abductor pollicis longus and extensor pollicis brevis for tenderness and swelling in De Quervain’s disease)
   - Palpate dorsal aspect for the ganglion and plantar surface for Dupuytren’s contracture.
   - Look for tenderness along flexor tendon at A1 pulley to r/o trigger finger
   - Any tenderness at the floor of anatomical snuff box suggest fracture of scaphoid bone
C. Movements

- **Extension:** Ask to the patient to maximally extend or dorsiflex the wrist. Normal wrist extension is $75^\circ$.
- **Flexion:** The patient is asked to maximally flex the wrist. Normal up to $80^\circ$.
- **Adduction:** Ask the patient to maximally adduct the wrist.
- **Abduction:** Ask the patient to maximally abduct the wrist.
- All the movements are restricted in arthritis, tenosynovitis, and joint effusion

Functions and special test

- **Finklestien’s test:** Stabilizing the patients forearm having the patient fully flex the thumb into the palm. The examiner then actively forces the wrist towards the ulna. Sudden severe pain is positive for de Quervain’s tebosynovitis
- **Tines’s sign:** The patient asked to place the palm upward and the examiner brings the affected hand into full dorsiflexed position to compress the carpal tunnel with flexor retinaculum. The examiner then percusses the median nerve using the broad side of a hammer. The sign is positive if patient perceives the paraesthesia in thumb index and middle finger.
- **Phalen’s test:** The patient is asked to allow the wrist to hang downward in a fully but not forced palmer flexed position for a minimum of 30 seconds. The Phalen’s test is positive if the patient’s symptoms are reproduced.
- **Spread sign:** The patient is asked to spread the fingers apart as far as possible in comfortable relaxed position on examination table. A positive sign unable to spread two or more fingers apart.
- **Durkan’s test:** Applying firm pressure on the palm over median nerve for 30 seconds will elicit symptoms.

Examination of Elbow

A. Inspection

The anterior and posterior elbow should be inspected in all positions.

- **Look for the angle of the elbow** (increased angle in ligament or fracture)
  
  Normal carrying angle is $7^\circ$ for men and $10^\circ$ for women
  
  Cubitus valgus if carrying angle $>$ normal
  
  Cubitus varus (gun stock deformity) if Carrying angle $<$ Normal
- **Look for swelling or rubor** (arthritis inflammation, infection)
- **Look for muscle wasting, scar, ecchymosis, lacerations, deformities and skin changes**
- **Look for olecranon swelling** (olecranon bursitis), subcutaneous nodule along posterior ulna (rheumatoid arthritis).
B. Palpation

- Medial aspect: Palpate medial epicondyle for tenderness in Golfer’s elbow
  Ulnar nerve in the sulcus between medial epicondyle and olecranon

- Posterior aspect: Palpate posterior elbow for olecranon bursitis
  Palpate triceps tendon

- Lateral aspect: Palpate lateral epicondyle for tenderness of tennis elbow.
  Palpate distal and radial to lateral epicondyle for radial tunnel syndrome

- Anterior aspect: Palpate antecubital fossa to identify any swelling or soft tissue mass.
  Cubital tunnel is a triangular space bordered by brachioradialis, pronator teres and line joining epicondyles

C. Movements

- **Range of motion** should be checked in flexion, extension, pronation, supination.
  Normal flexion: $135^\circ$, extension: $0^\circ$, pronation and supination: $90^\circ$

- **The valgus test for ligament**: In standing position abduct shoulder approximately $75$ to $80^\circ$. The patient is then asked to flex the elbow approximately $30^\circ$. The examiner then exerts valgus stress for medial ligaments and varus stress for lateral ligaments.

D. Function and special tests

- **Froment’s test (ulnar nerve entrapment at elbow)**: The test is performed by asking the patient lightly grasp a piece of paper between thumb and finger. Increased pinch strength is required to compensate weakness causing increased flexion deformity.

- **Tennis elbow test**: The test is performed by stabilizing the patient’s forearm and having the patient clench the fist and actively extend the wrist. The examiner then attempts to force the wrist into flexion. Sudden severe pain is positive sign.

- **Golfer’s elbow test**: The test is performed by stabilizing the patients forearm and then having the patient actively flex the wrist. The examiner then attempts to force the wrist into extension. Sudden severe pain is positive sign.

**Neurological examination of upper limb**

1. Sensory examination of upper limb

   - Look for sensation like touch, pin prick, vibration or temperature.

   - Sensory loss affected by root lesion
     - C5 lateral arm (over the shoulder and lateral arm)
     - C6 lateral forearm and thumb
     - C7 middle finger tip
     - C8 ring and little finger
     - T1 middle part of arm

2. Motor examination: check muscle power of all groups of muscles of upper limb
3. Reflexes: Check reflexes of upper limb.
   - Biceps C5-6: The patient's arm should be partially flexed at the elbow with palm down and place thumb or finger on bicep tendon and strike finger with reflex hammer look for response.
   - Supinator C5-6: Have the patient rest the forearm on the abdomen or lap and strike the radius about 1-2 inches above the wrist look flexion and supination of forearm.
   - Triceps C6-7: Support the upper arm and let the patient's forearm hang free and strike the triceps tend on above the elbow with broadside of hammer look for response.

4. Special test
   - Spurling’s test: check for cervical radiculopathy. Standing behind patients back, the examiner rests his interlocked fingers of both hands on top of the patient's head. He then flexes the patient's neck to around 30° to the affected side and the applies a downward axial compression. Radiating pain starting from neck along the affected cervical root is noted.
   - Adson’s sign: Loss of radial pulse in arm while rotating head to the ipsilateral side with extended neck following deep inspiration. It is positive thoracic outlet syndrome.
Pain is the most common reason for which patients seek medical help. Pain results from complex physiological adaptations of molecular and biological function; it is an emotional experience as well.

Pain historically was explained in a spiritual and religious context. Then in 1811, Scottish surgeon Charles Bell put forth the concept that pain had a truly physical basis and this opened the way for further studies. Emery Rovenstine was the first anaesthesiologist who opened a nerve block clinic at Bellevue in 1936. But John Bonica is considered as father of pain medicine who first started multidisciplinary pain clinic. In 1953 he came up with first book on pain management, ‘The Management of Pain.’ He promoted the use of therapeutic nerve blocks. In his preface he has written that his intention was to relieve pain by nerve block in patients of war injury. This gave gratifying results. Thus, pain management specialty started with the intension to relieve pain without much attention to diagnosis and methods of clinical examinations of patients of pain.

In 1960s UK physician Cicely Saunders emphasized the concept of ‘total pain,’ a clinical phenomenon that compounded physical and mental distress with social, spiritual and emotional concerns demanding holistic approach of management focused on the individual patient. She was planning a model of hospice that would provide exemplary palliative care. With advent of palliative care, the core concept of relieving patients’ suffering (symptoms palliation) without trying to cure the disease was stolen by palliative care concept.

Pain is never a normal phenomenon and some pathology always underlies. Chronic pain is complex with patients often developing anxiety and depression apart from somatic preoccupation as well as tendency to develop other life problems. Sometimes pain generator or pathological cause may be unknown. The intensity of the pain can be out of proportion to the underlying pathology. In order to treat something we must learn to recognize it. Failure to identify and address all factors contributing to the patients’ ‘total pain’ will prevent the implementation of effective treatment strategies, often leading to mutual frustration between patient and physician. Assessment of pain should determine all the relevant factors. Thus, factors contributing pain were gradually identified. But systematic methods of clinical examinations to diagnosis the aetiology of pain were ignored.

Pain management is an evolving speciality. In present scenario there is lack of uniformity among pain physicians in assessment of patient with chronic pain. There is always confusion about how to proceed for history taking, which systems should be examined, what should be the sequence. The present scenario need to be changed and we must emphasize in making our clinical methods uniform throughout the world. One should search for the pain generator and search for the pathology which has converted a normal tissue into a pain generator. Pain physicians need to have a good knowledge of orthopaedics, neurology, rheumatology, physical medicine, psychiatry and the skills of anaesthesiologist and neurosurgeon. Detailed history and proper physical and psychological examination gives us various clues in making a relevant diagnosis and formulating treatment plan. Detailed assessment of pain should also include psychological aspect.

Four steps to make diagnosis in management should be followed including detailed history and analysis of symptoms, physical examination, investigations based on the history and physical examination findings, and diagnostic interventions. In chronic pain management, first and fourth steps are very significant.

For successful evaluation of a patient with chronic pain development of mutual trusting relationship between clinician and a patient is needed. Pain specialist shall allot sufficient time to assess a new patient so that patient should feel that they have been listened to, their fears have been acknowledged, and the practitioner is there for them. Practitioner should remain empathic, not sympathetic, to the patient’s issues.
Interview technique and patient completed questionnaire are helpful for evaluation of pain. Psychological and psychiatric assessment should also be done.  

Most of the pain generators are from musculoskeletal system, so we should have a good clinical knowledge about this system. Ruling out the red flag is must. The findings from clinical examination are always more important than any investigations when both of them happen to be contradictory. If our treatment plan is not based on our diagnostic model, we may end up giving wrong treatment. Based on the physical examination and investigations if identifying the pain generator is confusing diagnostic interventions can be helpful. Moreover it is always better to seek help from other speciality person.  

So, a detailed history and focused physical examination backed by laboratory investigations and diagnostic interventions along with the multidisciplinary approach will help us to get to correct diagnosis and formulate a treatment plan accordingly. 

Steps of evaluation:  

1) History:  
   a. Chief complain  
   b. History of present illness  
      1. Assessment of intensity of pain  
         a. Unidimentional  
         b. Multidimentional  
      2. Assessment of quality of pain  
         a. Nociceptive/neuropathic etc  
      3. Aggravating/relieving factors  
      4. Diurnal variation  
   c. Family history  
   d. Medical history  
   e. Personal history  
   f. Other symptoms related with specific type of pain  
   g. Questioners/history related with psychological health  

2) Clinical examination:  
   a. Inspection  
   b. Palpation  
   c. Range of movements  
   d. Neurological examinations  
      I. Evaluation of higher function  
      II. Examination of cranial nerves  
      III. Examination of sensory system  
      IV. Examination of motor system  
   e. Special tests  

3) Investigations:  
   a. Blood tests  
   b. Image  

4) Diagnostic interventions:
References:


INTRODUCTION

- Electrophysiological/Electodiagnostic (EDX) studies are integral part in evaluation of disorders of peripheral nervous system.
- It may be considered as an extension of clinical examination
- Clinical localisation is a must before asking for an electrophysiological study.
- As NCS results are highly context specific, tests should be ordered with a clear indication and specific clinical question will yield more useful information

NEED FOR EDX STUDIES:

- localise the site or level of the lesion; determining if the pathology involves the peripheral nerve, neuromuscular junction, plexus, nerve root or anterior horn cells.
- Identify the pathophysiology, in particular distinguishing axonal loss from demyelination
- Acute/subacute/chronic.
- Diagnose mononeuropathies (eg. common nerve entrapments such as carpal tunnel syndrome, ulnar neuropathy at the elbow and peroneal palsy)
- Hereditary v/s acquired
- Diagnose more diffuse processes (eg. generalised peripheral neuropathy due to diabetes or GBS).
- Assess the prognosis/ complications of therapy

LIMITATIONS/ PITFALLS OF EDX

- NCS test large myelinated fibres. Small fiber neuropathies that present with pain may therefore have normal sensory studies.
- Anomalous innervation, such as Martin-Gruber anastomosis
- Early in the course of disease (eg. Guillain- Barré syndrome or carpal tunnel syndrome), changes may be relatively subtle and therefore missed. A repeat study may be required at a later time to confirm the diagnosis
- Late responses provide some information about proximal segments of the peripheral nervous system, however, NCS may still miss disorders that only affect nerve roots or plexus.
- Reference values for comparison are derived from studies of neurologically ‘normal’ subjects frequently reported as 95% confidence limits
• Nerve conduction varies across different age groups. This is particularly important when interpreting sural sensory responses in an older age group (>65 years) or paediatric patients where reference values are not well defined.

• **The aims of the nerve conduction study (NCS) and electromyography (EMG) in CTS are:**
  • To demonstrate a distal lesion of the median nerve.
  • To exclude other peripheral conditions that can result in similar symptoms like high median neuropathy, C6-C7 radiculopathy, lesions of the brachial plexus or even polyneuropathy.
  • To assess severity of CTS and for therapeutic decisions.
  • Baseline to assess the outcome after intervention.
  • The degree of electrophysiological abnormalities may not always be proportional to the duration or severity of symptoms.
  • Localise the site or level of the lesion; determining if the pathology involves the peripheral nerve, neuromuscular junction, plexus, nerve root or anterior horn cells.

**EMG:**
  • The term electromyography refers to methods of studying the electrical activity of muscle.
  • EMG has been used to detect and characterize disease processes affecting the motor units and to provide a guide to prognosis.
  • Helpful when clinical evaluation is difficult or equivocal.
  • The findings permit the underlying lesion to be localized to the neural, muscular, or junctional component of the motor units in question.
  • When the neural component is involved, the nature and distribution of EMG abnormalities may permit the lesion to be localized to the level of the cell bodies of the lower motor neurons or to their axons as they traverse a spinal root, nerve plexus, or peripheral nerve.
  • The EMG findings per se are never pathognomonic of specific diseases.
  • It cannot provide a definitive diagnosis.
  • They may justifiably be used to support or refute a diagnosis advanced on clinical or other grounds.
  • Electromyography is also used in conjunction with nerve conduction studies to obtain information of prognostic significance in peripheral nerve lesions.

For example, EMG evidence of denervation implies a less favorable prognosis than otherwise in patients with a compressive or entrapment neuropathy.

**Needle:**
  • The concentric needle electrode is a convenient recording electrode for clinical purposes.
  • It consists of a pointed steel cannula within which runs a fine silver, steel, or platinum wire that is insulated except at its tip.
• The potential difference between the outer cannula and the inner wire is recorded, and the patient is grounded by a separate surface electrode.
• Alternatively, a monopolar needle electrode can be used.
• This consists of a solid needle (usually of stainless steel) that is insulated except at its tip.
• The potential difference is measured between the tip of the needle, which is inserted into the muscle to be studied, and a reference electrode (e.g., a conductive plate attached to the skin or a needle inserted subcutaneously).
• The needle electrode is inserted into the muscle while it is relaxed so that the presence and extent of any insertion activity can be noted.
• see for the presence of any spontaneous activity.
• Following this, the parameters of individual motor unit action potentials are defined in different sites during graded muscle contraction, attention being directed not only to the shape and dimensions of the potentials but also to their initial firing rate and the rate at which they must fire before additional units are recruited.
• Finally, the interference pattern is compared with the strength of contraction during increasingly powerful contractions, until full voluntary power is being exerted.
• Needle EMG is an invasive procedure, and concern has increased about infective complications, involving both patients and electromyographers, especially involving human immunodeficiency virus (HIV), hepatitis virus, or Creutzfeldt-Jakob disease.

### Summary of character of EMG sound

<table>
<thead>
<tr>
<th>POTENTIAL</th>
<th>Sound characteristic</th>
<th>Firing pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>End plate noise</td>
<td>Sea Shell (Hissing)</td>
<td>Irregular</td>
</tr>
<tr>
<td>End plate spike</td>
<td>Sputtering Fat in a Frying pan</td>
<td>Irregular</td>
</tr>
<tr>
<td>Fibrillation</td>
<td>Rain on tin-Roof</td>
<td>Regular</td>
</tr>
<tr>
<td>Positive sharp waves</td>
<td>Dull Pop Tick-Tock of a Clock</td>
<td>Regular</td>
</tr>
<tr>
<td>C R D</td>
<td>Machine like</td>
<td>Perfect Regular</td>
</tr>
<tr>
<td>Myotonia</td>
<td>Revving Engine Dive bomber</td>
<td>Waxing Waning</td>
</tr>
</tbody>
</table>
A basic idea of Neurological examination is very relevant for the Pain Physician. In the upcoming workshop, by learning the basic neurological examination, the participants will be able to:

2. Learn about the various dermatomal distribution in upper and lower extremities.
3. Distinguish between radicular, referred and other types of pain.

Detect candidates (patients) who require surgery rather than interventional pain management.
SCIENTIFIC SESSION – WRITE UPS
Topic - Chronic pelvic pain – A Headache in Pelvis

Dr. Akkamahadevi P

There are many specific causes for Chronic pelvic pain (CPP) in men and women, but a significant number do not have a definite cause for the pain. The causes usually are complex and several pain inducing factors are implicated. As in most chronic pain syndromes, CPP rarely has a single source of pain generator, and often presents with a combination of neuropathic pain, a continuous inflammatory response and secondary muscle dysfunction.

Very often the patients have little or nothing wrong with them. These conditions are rather like a headache, except the location of the headache is in the pelvis. Hence the theme of our discussion is CPP – "A headache in the pelvis". Further implication from the title is that these disorders are problems of chronic muscle tension, which is often the basis of headaches.

If chronic pelvic syndromes are indeed a headache in the pelvis, then treatment needs to be radically different from what has traditionally been followed. There is a common effective treatment for many of them. Here the body and the mind are intimately involved in the cause and the treatment. The approach is multidisciplinary and challenging.

Here we plan to discuss in detail the causes for CPP. We also will deliberate on non-pharmacological management and innovative therapies.
1. **Somatic Interventions:**
   a. Trigeminal neuralgia: idiopathic or secondary
      i. Retrogasserian glycerol injection
      ii. Radiofrequency rhizotomy
      iii. Percutaneous balloon compression
   b. Maxillary nerve neurolysis or RF for diagnostic or therapeutic blocks for the painful tumours of the maxillary antrum
   c. Mandibular nerve neurolysis or RF for Ca tongue, lower jaw or floor of mouth.
   d. Glossopharyngeal nerve block/ neurolysis/RF
      i. Block to differentiate geniculate neuralgia from glossopharyngeal neuralgia
      ii. Block to indicate the extent of motor and sensory deficit before planning a neurolytic procedure
      iii. Palliation in cancer pain involving posterior tongue, hypopharynx and tonsils
      iv. Neurodestructive procedure for glossopharyngeal neuralgia
   e. Greater and lesser occipital nerve blocks for:
      i. Diagnosis and management of occipital neuralgia
      ii. Cervicogenic headache
   f. Sub occipital compartment decompression

2. **Sympathetic Interventions:**
   a. Sphenopalatine ganglion block and neurolysis for
      i. Sphenopalatine neuralgia
      ii. Atypical facial pains
      iii. Migraine and cluster headaches
   b. Stellate Ganglion block/ chemical neurolysis/ RF for:
      i. For the following painful conditions of head, neck, upper extremity and upper thoracic dermatomes:
         1. CRPS type 1 and 2
         2. Cancer pain of head, neck, upper extremity
         3. Acute herpes zoster and post herpetic neuralgia
         4. Post traumatic syndrome
         5. Painful vascular syndromes

3. **Spinal Neuroaxial procedures**
   a. Third occipital nerve block/ RF for cervicogenic headache/ third occipital headache caused by C2-C3 facetial arthropathy

4. **Joint Blocks:**
   a. TM joint block/ neurolysis
      i. Inflammatory non infectious conditions of TM joint
      ii. Neurolysis for failed TMJ surgical procedures
   b. Atlanto occipital joint block:
      i. Deep sub occipital movement(nodding) related pain
      ii. Occipital headache related to trauma of AO joint
   c. Lateral atlanto axial joint block:
      i. To r/out AA joint to be the cause of headache while other common causes have been ruled out
Pain management as a field is a relatively new entity and many a times involves overlapping into many specialities of medicine including superspecialities.

For a pain physician to enter into mainstream practice and prove a point used to be a Herculean task complicated by diverse complexities owing to its new existence. The most effective way to go about the issue is to educate and spread awareness about the new and advanced modalities in the management and treatment that have opened up and its effectiveness with providing relief with minimal invasiveness has started to fill the lacunae that has for so long been existing.

With imparting of education and opening up of the barriers, a pain physician’s communication skills with a primary physician, referring doctors, patient relatives and collaboration with colleagues are propelling in bringing the field to the forefront.

Involvement of both medical, paramedical and medicosocial staff due to the complex nature in management and treatment of chronic pain and providing effective relief have brought about a visible change in our existence as a speciality and the way the medical society has been viewing us as a speciality. With honed skills as an educator, communicator, and collaborator the trend of a pain physician from being an anesthetist behind the screen then to now playing a role of a primary Physician referring patients to respective departments and gaining recognition as a leader is evident. We hereby present a few cases that has made a difference and changed the perspective in which a pain physician is looked at.

1) case 1 - Role of a communicator in a child with calcific pancreatitis

2) case 2 - Role of collaborator in a patient with carcinoma of pancreas

3) case 3 - Role of leader in a patient with Abdominocutaneous nerve entrapment syndrome
**Introduction:** Chronic pelvic and urogenital pain syndromes have recently been recognized as a clinical entity. There is no generally accepted definition of chronic pelvic pain.

**Definitions:**
The International Continence Society (ICS) has defined the urogenital pain syndromes as: “Genitourinary pain syndromes are all chronic. Pain is the major complaint, but there may be concomitant complaints related to the lower urinary tract or bowel, or of a sexual or gynecological nature”.

The American College of Obstetricians and Gynecologists has proposed the following definition, limited to females: “chronic pelvic pain is noncyclic pelvic pain of at least 6 months’ duration that localizes to the anatomical pelvis, the anterior abdominal wall at or below the umbilicus, the lumbosacral back, or the buttocks and is of sufficient severity to cause functional disability or lead to medical care.”

Previously, Chronic pelvic pain (CPP) was defined as a noncyclic pain that had a duration of at least 6 months and can lead to decreased quality of life and physical performance.

The pain can be attributed to problems in the pelvic organs and/or problems in related systems, and possible psycho-social attributes may contribute to the manifestation.

Initially, thought to be common in females, males also report urogenital/pelvic pain. The pain is localized to the lower abdomen and the pelvic and perineal region; is chronic and causes significant emotional trauma and distress to the person as the distribution of pain complaints is localized to areas that are related to sexual function, defecation and urination; are often considered taboo and are complicated by psychological and unique physiological issues.

**Classification:**

A] The domains of chronic pelvic pain (CPP) syndromes include:

1) Related to the pelvic organs:
   - Lower urinary tract domain
   - Female genital domain
   - Male genital domain
   - Gastrointestinal domain

2) Other sources of pain which may be perceived in the pelvis, even though the actual site of the problem may not be within the pelvis:
   - Musculoskeletal domain
   - Neurological domain

3) Related to general factors that influence the response to the pain or its impact on the individual:
   - Psychological domain
   - Sexual domain
   - Comorbidities

B] The International Continence Society (ICS) introduced 7 pain conditions:
- painful bladder syndrome
- urethral pain syndrome
- vulvar pain syndrome
- vaginal pain syndrome
- scrotal pain syndrome
- perineal pain syndrome
- pelvic pain syndrome (occurrence of persistent or recurrent episodic pelvic pain associated with symptoms suggestive of lower urinary tract, sexual, bowel, or gynecological dysfunction in the absence of proven infection or other obvious pathology)

**Incidence:**
Male chronic pelvic pain syndrome: 8.2% (range 2.2–9.7%)  
Increases with age (men aged 50–59 have a 3.1-fold greater risk than those aged 20–39)

Scrotal pain syndrome: Not known  
After vasectomy surgery 2–20%  
2–6% have a visual analogue score > 5 /10

**Pathophysiology:**
Pathophysiology of urological chronic pelvic pain syndrome (UCPPS) is still poorly understood. The term pelvic pain is an enigma as it does not give a clear indication of the mechanism of the pain and does not take into account that many of the symptoms and signs may be outside of the anatomical pelvis.

**Assessment:**
Till date, diagnosis was based on exclusion of other conditions as often, examination and investigational workup remain unrevealing, and no specific cause of the pain can be identified. But, for a patient presenting with pelvic pain, thorough history is crucial, including establishing that the pain has been present for at least 6 months, identification of any potential inciting event and/or triggers, character, radiation, and severity. Careful clinical history and examination show that patients with pelvic and urogenital pain often suffer from “more than one pain.”

An indication of the source of pain is vital, yet it can be obscured in individual cases by the range of possible primary sources and secondary consequences, and the varied responses. To ensure a systematic approach, the ICS set out a series of “domains” which serves as a checklist to facilitate consideration of possible issues.

The assessment of CPP in males includes questioning to assess onset, duration, inciting factors, laterality and any effect on urination and sexual function. A rectal examination is needed and thorough evaluation of the genitalia, which may be performed in the supine and standing positions to identify any lesions, masses, and discharge.

Patients affected in the gastrointestinal domain commonly report constipation, diarrhea, defecatory pain, obstructive defecation, abdominal cramping, or rectal pain/pressure/burning.  
The main components are:

1. The Anorectum: Anorectal problems may result from hemorrhoids, abscesses, fissures, ulcers, levator ani syndrome, or chronic proctalgia
2. The Colorectum:. Colorectal problems may give rise to abdominal tenderness, watery/bloody diarrhea, or rectal bleeding and systemic features (weight loss and fever). Inflammatory bowel disease and malignancy must be excluded.
3. Functional disorders should be ruled out, including irritable bowel syndrome.

There is a growing body of literature relating depression and catastrophizing to the experience of pain and pain-related sequelae in CP/CPPS (chronic prostatitis/chronic pelvic pain syndrome ). There is evidence that the response to noxious stimuli may be influenced by the gonadal hormonal changes. Recent research has led to a growing consensus that the various clinical manifestations of chronic pelvic pain are a result of a complex interplay between events occurring in the viscera (urinary tract microbacteria) and CNS leading to:

1. enhanced perception of visceral and somatic signals (visceral and somatic hypersensitivity)
ii) Altered bladder motility
iii) Dysbiosis
iv) Altered mood and affect

Treatment: Current treatment strategies for pelvic and urogenital pain range from acupuncture to physical therapy to psychological interventions to local and systemic drugs to nerve blocks and neuromodulation. Since multiple different pathogenic pain mechanisms may coexist in patients presenting with chronic pelvic and urogenital pain, a combination of different pharmacological agents or treatment modalities (multidisciplinary approach) might be required to obtain an optimal result.

Recent Research:

i) There is an emerging association between ketamine abuse and the development of urological symptoms including dysuria, frequency and urgency, which have a neurological componentx.

ii) Food sensitivity implicated in Interstitial cystitis, Bladder Pain Syndrome (IC/BPS)xii.

iii) that urine alkalization therapy is likely to be effective in the treatment for hypersensitive bladder syndromexiv.

Summary: This is a complex condition and globally, there is a large amount of ongoing research in the wide spectrum of IC/BPS, chronic pelvic pain, the complexities of the nervous system and neuro-urology, comorbidities and their interactions, biomarkers and many new avenues of research and hopefully this will eventually bear fruit in the form of new treatment.


1 Shoskes DA, Nickel JC, Kattan MW. Phenotypically directed multimodal therapy for chronic prostatitis/chronic pelvic pain syndrome: a prospective study using UPOINT. Urology 2010; 75: 1249–53


1 Emeran A Mayer et al; Clinical Science of Chronic visceral Pain; 16th WCP-Refresher Courses

1 IPBF e-Newslette and Research Update; Issue 35, January 2014


Why anatomy of spine is important for pain physicians: As a pain physician we should be aware of different parts of spine as a pain generator.

- 60-70 percent of people suffer from back pain once in their life time.
- 33 different vertebral bodies in five different regions and curvatures with different morphology and function.
- Different parts of spine- intervertebral disc, vertebra, facet joints, underlying nerve roots etc are different pain generator which needs to be identified.
- Curvatures of spine- alternating lordotic and kyphotic curves provides elasticity and gives resistance to axial loading forces.
- Role of spine as a central axis
- The compression of spine occurs as a result of the force of gravity, ground reaction force and the force produced by the ligaments and muscular contractions.

Function of spine:

- It’s role in protection of spinal cord
- It’s role in maintaining posture, providing support and flexibility to the body giving range of motion for different activities.

Clinical significance: Each part of vertebrae and surrounding structures can be a pain generator leading to chronic pain due to changes in the mechanics of the spine and its structures and also due to changes in the central axis.

Intervertebral discs- outer layer of disc annulus fibrosis has nerve innervation and is sensitive to pain, although the inner part nucleus pulposus is insensitive.

Vertebral arch and spinal canal: the arch made up of laminae and pedicle, which are two important structures with respect to various interventions done for management of chronic pain. Under each pedicle, a pair of spinal nerves exits the spinal cord and pass through the intervertebral foramen.

Facet joints- these small joints allow the flexion extension of the vertebrae and prevent the exaggerated movements of the spine. Facet joints have a Clinical significance in identification as a pain generator.

33 pairs of spinal nerves gets compressed under the foramen due to disc protrusion is a common source of Radiculopathy. Each pair on nerve has different dermatomal distribution leading to pain in different areas of body. Knowing the anatomy will help in identification of the culprit nerve root involved.

Different spine structures acts as a identification point for the various interventions and procedures done for the pain relief. Pedicle of spine being one of the most important structure.
Introduction

Pain has been defined as “An unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” (IASP 1994). Majority of pains disappear once tissue healing occurs. However when pain persists beyond 3-6 months or when it persists beyond the period of tissue healing it is considered to be chronic in nature.

Chronic pain is complex in nature, with no identifiable pathology or pain disproportionate to the extent of the pathology and therefore a challenge to the treating physicians. Patients suffering from such pains, are often inactive and unable to continue with their normal function. When the pain has not been resolved over time with repeated visits to physicians, they often lose hope of every recovering and consider themselves disabled. They also suffer from depression, anxiety, frustration and a sense of uselessness which ultimately drives them to despair. Chronic pain is now considered as a disease of the person and is multidimensional (IASP)

The biopsychosocial model of pain (as shown below in fig1.) clearly explains the interaction of the physiological, psychological and social factors in chronic pain and is widely accepted.

Cancer pain is another pain which is most feared by patients with cancer. It can occur at any stage of the disease, with at least 30% presenting with pain in the early stages. A concept of “Total Pain” which was coined by Dame Cicely Saunders way back in 1978, clearly explains the helplessness of patients with this problem. The pain is not just physical, but psychological, social, emotional and spiritual aspects heighten the severity of pain perception.

In both of the above mentioned, pain cannot be treated successfully by a single physician and with just pharmacological management. Since such pain affects all aspects of a patients functioning, treatment of such patients requires dealing with psychosocial and behavioural aspects in addition to the pathology. Such a pain requires requires clinicians from various disciplines working together in an integrated manner with common goals and outcome measures also known as Interdisciplinary pain management.
Such care involves a pain physician, an anaesthetist, nurse, an occupational therapist, a physiotherapist and a psychologist all working as a team to provide coordinated care with roles complimenting each other to enhance patient care complementary roles that enhance patient care. (Fig 2). Each team member has valuable knowledge in his or her field along with skills that complement each other. There is no hierarchy in this sort of a program and all members contribute meaningfully towards one goal, that is getting the patient back to his original physical & mental status with common outcome measures & regular meetings. Treatment of patients is consensus based.

Fig 2: Interdisciplinary pain management

While dealing with cancer patient’s pain, the palliative care team also plays an important role in the interdisciplinary team.

Goals of Interdisciplinary pain management
- To reduce pain
- To increase activity
- Reduce disability
- To reduce emotional distress, anxiety, depression and to improve coping strategies
- Optimize medical management

WHAT DO INTERDISCIPLINARY PROGRAMS INVOLVE?
It is well known now that chronic pain may never totally disappear, hence patient should be given realistic goals. The patient and his care givers should be aware of this fact and be actively involved in the program which would be patient centric

Medication management: aim to simplify schedules of analgesics & optimize analgesia

- Graded physical exercise to help overcome anxiety about physical activities
- Cognitive behavioural training: to change the patients thinking pattern especially their response to pain. Involves biofeedback, relaxation and help self-regulate pain
- Decrease impact of pain on daily function. Involves counselling and adaptation

Clear focused goals play an important role in successful management of chronic pain patients. Unrealistic goals will lead to disappointment and failure of the program.

Interdisciplinary treatment programs compared to conventional care:

- work very well and accomplish goals.
- often more successful than interventional or conventional care.
- cost less than interventional care.

Outcomes of interdisciplinary programs have been extensively studied and have reported 20- 60% reduction in pain, reduction in opioid use, increased physical activity and return to work.

A recent study identified evidence for the short-term effect of the IOPP in chronic pain patients as well as the long-term effect for the variable “pain-related psychological strain.”

CONCLUSION

- Chronic pain is complex biopsychosocial phenomena that develops over time
- Conventional strategies do not work well
- Research suggests interdisciplinary team is more geared for treating
- Patient, care givers and all stakeholders involved
- Aim or goal is to improve functionality

REFERENCES

Temporomandibular Joint Disorder (TMJD) is a major cause of nondental, chronic pain in the craniofacial region, second only to headache. TMJD has a prevalence of up to 20% in the adult population and is more common in women than in men. However, there is wide variation in the clinical presentation of TMJD, and the absence of universally accepted guidelines for TMJD evaluation and diagnosis compromises consistent therapy. Several studies indicate that approximately 60-70% of the population has at least one sign of TMJD at some point in life, yet only 5% need treatment for TMJD. During the course of this presentation, we will discuss three cases patients with TMJD and associated symptoms:

1) **TMJD and fibromyalgia**

Chronic TMJD, especially myofascial component of TMJD, is considered a functional pain syndrome similar to fibromyalgia, irritable bowel syndrome, interstitial cystitis and chronic fatigue syndrome. These conditions appear to have common etiological factors, which explain the great comorbidity of symptoms. Functional disorders tend not only to cumulatively affect an individual, but also to present central sensitization and amplified pain perception.

2) **Bilateral condylar dislocation in post-stroke patients**

A broad range of neuromuscular and neurological disorders, including stroke, can cause Involuntary TMJ dislocation. Weakness of the muscles associated with mouth-closing which are primarily innervated by trigeminal nerve cause condylar dislocation in stroke patients.

3) **Sleep Apnea Symptoms and Risk of Temporomandibular Joint Disorder**

Obstructive sleep apnea and nocturnal parafunction are co related. Because symptoms of TMJ and sleep apnea often mimic each other and overlap it is important to correctly diagnose the patient. Studies show that obstructive sleep apnea is the highest risk factor for tooth grinding during sleep. Sleep disordered breathing can adversely affect REM sleep. The reduction of REM sleep can increase a patient’s pain level including pain from within the TMJs and orofacial pain.
Abstract: Functional MRI (fMRI) is the most commonly used imaging methods in chronic pain research. Other imaging modalities include PET, Magnetic Resonance Spectroscopy (MRS) and Arterial Spin Labelling (ASL).

fMRI is a very useful non invasive modality for obtaining information related to neural networks and their activities. The basic physics used in fMRI is the BOLD effect (Blood Oxygenation Level Dependent). fMRI detects the blood oxygen level-dependent (BOLD) changes in the MRI signal that arise when changes in neuronal activity occur following a change in brain state, such as may be produced, for example, by a stimulus or task. Hence, functionally connected networks can be identified. Two types of fMRI include: stimuli based fMRI and resting state fMRI.

Stimuli based fMRI uses either block designs or event related paradigm (oddball) to record neural network activations. Resting state fMRI provides information about the natural state of brain activity in chronic pain without having to apply any external sensory or cognitive stimulation.

fMRI in chronic pain is still under research phase and is used to identify the neural networks involved in pain process and changes in the pain matrix in different chronic pain conditions such as fibromyalgia, chronic back pain etc. Areas in brain such as thalamus, the insular cortex, the primary and secondary somatosensory cortices, the anterior cingulate cortex, and the prefrontal cortex are consistently shown to be part of the pain matrix in various studies. Other promising applications include therapy response assessment, live neurofeedback response and training.

Limitations of fMRI include relatively poor spatial resolution. Limited sensitivity as the BOLD effect is small so require multiple samplings of brain responses. Variable hemodynamic response limit temporal resolution. Images prone to subject motions, medications, everyday substances and age. Availability and long acquisition time may limit practical usage.

fMRI is still in research phase and has greatest future potential if technology can offer high spatial and temporal resolution. The data set can act as a seed for machine learning software developments.
Background

Chronic pain is one of the most prevailing apprehension for seeking medical care in adults (1), which is linked to constraints in mobility, daily activities, dependence on opioids, anxiety and depression, poor perceived health and reduced quality of life (2-4). Chronic pain whether cancer or non-cancer pain is a costly and significant problem in both developed and developing countries (5).

Historically, chronic pain was managed by individual health care providers, usually a physician using conservative management and biomedical interventions. However, the biopsychosocial model of pain and disability is now widely accepted approach for treatment of chronic pain. According to biopsychosocial model, pain is widely regarded as a complex phenomenon with inputs from biological, psychosocial and socioeconomic factors. Chronic pain affects all aspects of an individual's functioning. Hence, management of chronic pain need to include psychosocial and behavioural factors as well as the extent of their underlying physical pathology. This demands multidisciplinary or interdisciplinary approach to addresses the many facets of pain.

The expertise of different clinical specialties are obligatory for the assessment and treatment of chronic pain. In general it assumed that efforts to involve more than one discipline are valuable and beneficial hence necessitates hospitals to establish multiple disciplinary teams for managing of the chronic pain condition. Multidisciplinary and interdisciplinary terms are often used interchangeably to denote efforts that involve several disciplines.

In multidisciplinary care, individuals from different disciplines work together on a common problem, with limited interaction and coordination. Whereas interdisciplinary care have complementary roles that enhance patient care. In multidisciplinary care treatment may occur with different goals rather than as an integrated approach and each team member has a clearly defined place in the overall care of the patient, contributing their expertise in relative isolation from one another. In interdisciplinary team, each discipline has a valuable base of knowledge and a set of discrete skills that complement each other. Although roles may overlap, team members are collaborators and partners, but not substitutes for each other. Interdisciplinary teams encourage complementary roles and responsibilities, conjoint problem solving, and shared accountability. In interdisciplinary care treatment decisions are usually based on consensus-based and the process of arriving at the decisions is essential to the team’s recommendations and treatment implementation. Although we are aware that not all facilities and programs have achieved this level of integration, we will nonetheless use the term interdisciplinary as a model of coordinated pain care.

Interdisciplinary pain model

The International Association for the Study of Pain (IASP) task force recommended that interdisciplinary pain centres offer a diversity of health care providers with sufficient professional breadth to comprehensively address the biopsychosocial model of pain (10, 11). They suggested that staff in Interdisciplinary pain include at least two physicians (and/or a psychiatrist), as well as a clinical psychologist, a physical therapist, and additional health care providers (if needed) to address the particular needs of specific pain populations served by the centre. The task force guidelines also included a requirement for regular meetings among the care providers organized by a centre director. They also recommended that assessment and treatment options be comprehensive and include physical medicine services (e.g., physical exams, medication management), psychosocial services (e.g., biopsychosocial evaluation and cognitive-behavioral treatment), physical and occupational therapy services (e.g., manual therapies and functional restoration through guided exercise), and referrals for any additional specialty care not offered by the interdisciplinary team.
Features of interdisciplinary pain treatment

Inclusion of a shared philosophy, mission, and set of objectives. Interdisciplinary models acknowledge and support the interdependence among team members that fosters an alliance of mutual respect and open communications. These shared roles and responsibilities of interdisciplinary teams offer more than the sum of the competencies of the individual team members.

- Interdisciplinary care is patient, family and stakeholder centered with different goals depending on type of pain and state of the patient’s disease.
- Depending on the presenting problem, various team members in the interdisciplinary care involves in the initial assessment as well as in ongoing assessment throughout the treatment process at appropriate follow-up.
- By taking inputs from appropriate team members interdisciplinary team can the development of a treatment plan. It also involves the execution of the treatment plan concurrently.
- Each team member of Interdisciplinary care must be familiar with the overall treatment plan, the methods and modalities being used, and the goals of each discipline working with the patient that contribute to the overall goals (i.e., reduction of pain, improved pain tolerance, and improvements in physical and emotional functioning, patient satisfaction).
- Ongoing communication among the team members, with the patient and family, referring providers, and for example a physical therapist may be focusing on upper body strength, flexibility, and endurance with the general goal being improvement of physical function and establishment of a self-management program (e.g., daily exercises). A psychologist may focus on increasing interpersonal skills to help patients communicate more effectively with family members and thereby improve emotional functioning. A nurse may address components of a healthy lifestyle while a physician may attempt to optimize medication benefits (i.e., analgesia, improved mood, and restorative sleep) limit adverse events, and monitor for adverse events and misuse. A unified message should be provided to patients such that the team members reinforce the methods being used across disciplines. Frequent communication among team members can identify problems in any area that may be addressed in another
- Necessary paperwork and patient-generated documentation such as follow up assessments, should be shared between the team members
- Outcomes that are important to stakeholders should be understood, considered, and when possible and reasonable, included as goals of treatment. Clear communication about the treatment plan, treatment methods, and outcomes that will be used to assess treatment effects should be outlined and provided to stakeholders as well as patients, caregivers, and significant others.
- At the discharge, patients, caregivers, and significant others usually provided with appropriate information about continuation of care plans, appropriate strategies for maintenance, generalization, and adherence to treatment recommendations as required, follow-up procedures, strategies for addressing relapse of symptoms, and a designated contact team member to address any question or problems that might arise

Efficacy and cost effectiveness of Interdisciplinary pain model

The efficacy and cost-effectiveness of interdisciplinary pain management programs have been well documented in the scientific literature.

Urk and Okifuji compared the effectiveness of interdisciplinary pain management programs with that of conventional medical treatments. (12) The interdisciplinary treatment programs were more effective at reducing medication use, reducing emotional distress, reducing healthcare utilization, reducing iatrogenic consequences, increasing return to work and activity, and closing disability claims. In contrast, conventional medical treatments had negative outcomes in medication reduction, healthcare utilization, iatrogenic consequences, and return to work. (12) Chou and colleagues (2009) rated the use of interdisciplinary treatment for low back pain as a “strong” recommendation associated with a “high” quality of evidence and there has been considerable additional clinical research in recent years supported the validity of this approach. (13) Oslund et al. (2009) explored the long term effectiveness of interdisciplinary pain management programs and found that patients reported improved outcomes across a range of domains and that these gains were maintained at one-year follow-up. (14)
In a recent study, Okifuji et al analyzed the cost benefits and cost-effectiveness of interdisciplinary pain management programs (3). Using existing data, they calculated the savings possible for 17,600 patients, the estimated number of patients treated annually in interdisciplinary pain management programs. Cost savings were dramatic for persons who had been involved in interdisciplinary treatment programs: $260 million in 1-year posttreatment nonsurgical medical costs would be saved for individuals treated in interdisciplinary programs rather than with conventional or nonsurgical treatment. Patients treated in interdisciplinary programs would spend $280 million less for medical costs in the year following treatment and additional surgery than those treated conventionally.

Weiner and Nordin (2010) found that interdisciplinary care demonstrated greater overall effectiveness than numerous other common pain management interventions, including medication and cognitive-behavioral therapy. (15)

OUR EXPERIENCE AT PGIMER, CHANDIGARH: A TERTIARY CARE PUBLIC SECTOR:

We at PGIMER, Chandigarh have evolved from individual healthcare provider approach to multidisciplinary to interdisciplinary approach over last one decade since starting up of our formal pain clinic in March 2009. The pain clinic is run on two full days per week that is all Wednesday between 8.00am-5.00pm and all Saturdays between 9.00am-3.00pm. It attends to around 65-75 patients per clinic (~18-25 new patients and ~40-50 follow up patients) at 5th Floor of new out-patient block of PGIMER, Chandigarh.

Currently ours is a pain physician (anaesthesiologists) led interdisciplinary approach with two additional mandatory members of this team being a physiotherapist and a clinical psychologists (psychiatrist in our case). One MSc/PHD pharmacy student (from National Institute of Pharmaceutical Research, NIPER, Mohali as a research collaborative partner) is a part of our team who attends all the pain clinic, conducts research and also help in clinical nonpharmacological as well as pharmacological management of patients. These students are integral part of our interdisciplinary team since last 5 years.

As a part of interdisciplinary team management, almost all the patients (nearly 85-90%) are advised to attend to the physical medicine and rehabilitation department on the same day (ground floor of the same building). This is done in collaboration wherein a detailed written documentation of assessment, evaluation and treatment goals is provided in all the cases in a standard operating protocol manner. In few required patients based on individual need (25-30%) a telephonic detailed discussion is performed on the same day and; if further required a face to face conferencing is organized between pain physician, physiotherapist and psychiatrist by the end of the clinic at between 4.00pm-5.00pm.

A psychiatry resident is requested to join the pain clinic (all Wednesdays and Saturdays) to assess and evaluate all the new patients in detailed structured way and to provide any psychiatry intervention in required patients. He/she is also requested to evaluate the selected follow up patients who are psychologically screened by pain physician and where psychiatrist involvement is assessed to be needed. However, the physical presence of psychiatrist in the pain clinic is not always possible depending on the workload of their own department and availability of manpower. In that case, all the patients are psychologically evaluated by pain physician using screening questionnaire tools and the patient needing detailed structured evaluation (~60-70% of new patients and ~30% of followup patients) are are referred to the psychiatry OPD (3rd floor of the same building) on the same day after written detailed documentation. If required a telephonic detailed discussion is performed on for few select cases on the same day and; if further required a face to face conferencing is organized between pain physician, physiotherapist and psychiatrist by the end of the clinic at between 4.00pm-5.00pm alongwith patient, family and any other stakeholder.

Additional health care providers (if needed, such as internist, rheumatologist, neurologist, neurosurgeon, orthopedician, dermatologist, endocrinologist, dietician etc.) are involved in this team to address the particular needs of specific conditions in this pain populations served by the centre.

A point to emphasize is that the members of our interdisciplinary team work in collaborative, cordial and extremely understanding manner with mutual respect and open communication to achieve common
treatment goals. In fact we have created a small warm and cordial immediate and extended family of our interdisciplinary team. The team of three pain physicians consultant (Prof Babita Ghai, Prof Neerja Bharti, Prof Jeetinder Kaur Makkar) with their residents, two physiotherapist (Dr. Pradeep Sarkar, Dr Bibek) with their trainees, two psychiatry consultants (Prof Sandeep Grover, Dr Akhilesh Sood) with their residents, have formed an immediate family with extended family of neurology consultant (Dr Manish Modi), neurosurgeons (Dr Rajesh Chabbra, Dr Manjul Tripathi), orthopedicians (Dr Sarvdeep Dhatt, Dr Vishal and many more) and many more when needed.

All the health care providers in our interdisciplinary team are trained specifically to manage chronic pain patient and have deep understanding, pathophysiology and management of chronic pain. We also have weekly conferencing for selected patients.

Although, we have not studied the outcome of our interdisciplinary approach with our previous approaches of management in our set up using any research methodology or study but as per expert opinion we have seen very satisfactory outcome in our chronic pain patient management especially for the management of refractory and challenging chronic pain patients.

Conclusion:

Clearly, the integrated combination of medical, psychosocial, and physical rehabilitation implicit in interdisciplinary pain management results in a comprehensive treatment strategy that ushers in a more advanced stage of chronic pain management than traditional medical treatment alone. The result is that other effective treatment modalities (e.g., cognitive behavioral therapy) may be synergistically integrated into a collective effort geared toward patient wellness. All this evidence suggesting that interdisciplinary pain programs is the most cost-effective long-term treatment option. Furthermore, selecting the most cost-effective therapies (instead of the cheapest) contributes not only to long-term cost savings but also to vast improvements in health-related quality of life for the patient. (16) (19)

References


BACKGROUND AND AIMS:
Nervous system sensitization can be accompanied by both positive and negative sensory signs. The aim of this study was to explore the spectrum of sensory abnormalities in clinically diagnosed adults with neuropathic pain (NP) using a well-defined assessment protocol using quantitative somatosensory testing methods followed by Somatosensory Rehabilitation Protocol (SRP) developed by Claude Spicher.

METHODS:
A comprehensive assessment protocol of 60 subjects with NP associated with varying sensory abnormalities was conducted. The protocol involved Somato-Sensory Testing (SST) procedures and was performed by a Physiotherapist specially trained in SST methods. The subjects were assessed and diagnosed using a mix of subjective and objective measures as follows: Somatosensory Qualifiers, McGill Pain Questionnaire, DN4 Questionnaire, VAS and other specific tests for mapping the prognosis and were characterized under 4 different Neuropathic Dysfunctional Categories (NDC) followed by Somatosensory Rehabilitation Program (SRP) based on the type of NDC. Tests were repeated 1 month post rehabilitation for determining the reduction of symptoms and follow up after 3 months.

RESULTS:
Among 60 patients, 70% of the participants were male and in the age group of 30-40 years. 68% reported pain as the major symptom, 35% burning sensation, 20% tingling sensation, 15% pulling, electric shock like, parenthesis and hypersensitivity. 88% of the patients had involvement of lower extremity (LE). Posterior antebrachial cutaneous nerve was the most commonly affected nerve in the upper extremity and medial cutaneous nerve was most commonly affected in the LE. The most commonly affected regions were foot, heel and sole with burning, tingling and numbness as major symptom and elbow and ankle least affected. 45 subjects recovered completely post rehabilitation and maintained the progress during the follow-up, while 15 recovered partially.

CONCLUSION:
SST is an effective diagnostic protocol for individuals with NP and plays a key role in the effective rehabilitation of NP.
Chronic pain is more than just pain. It has superimposed fear, anxiety, depression, irritation and irrational behavior. Various theories have been proposed to explain chronic pain e.g. Gate Control Theory of Pain (Melzack & Wall, 1965), Neuromatrix theory (Melzack, 1999) and the latest in the list is Bio psychosocial model (Gatchel, 2005). The cognitive behavioral model for chronic pain incorporated techniques both from cognitive behavioral approaches to depression and anxiety and from the operant-behavioral model of chronic pain to address many of the clinical factors identified in multidimensional models of chronic pain by the bio psychosocial model.

GOALS OF CBT-
1. Reduce pain and psychological distress
2. Improve physical and role function by helping individuals.
3. Decrease maladaptive behaviors.
4. Increase adaptive behaviors.
5. Identify and correct maladaptive thoughts and beliefs.
6. Increase self-efficacy for pain management.

The various techniques used for CBT in chronic pain are-
1. Cognitive restructuring- identifying and reframing negative thoughts and their resulting behaviour.
2. Relaxation training- deep breathing, progressive muscle relaxation and Visualization.
3. Activity pacing- based on time and quota to improve functionality.
4. Sleep hygiene- sleep scheduling and strategies to improve onset, maintenance & quality.

Challenges in practicing in CBT
1. Ignorance on the part of the clinicians
2. Over dependence on pharmacological agents and interventions
3. Reluctance on the part of patients for psychological interventions
4. Consistency on the part of the patient and the clinicians
5. Time consuming

Indications of using CBT in chronic pain conditions (based on available literature)
1. Low back pain
2. Headaches
3. Arthritis
4. Orofacial pain
5. Fibromyalgia
6. Cancer pain

Understanding CBT -
Three interrelated phases

Phase 1:
Reconceptualization of chronic pain as manageable/controllable
Emphasis on re-learning scripts associated with pain

Phase 2:
Skill acquisition such as relaxation
Progressive Muscle Relaxation
Guided Imagery
Autogenic Training
Activity Scheduling/ Behavioral activation
Learning adaptive cognitive and behavioral coping skills

Phase 3:
Maintenance and relapse prevention
Self-management approach

**Structure of Sessions**

Session 1 - Interview and Assessment
Session 2 – 3  Orientation and Goal Setting
Session 4 -6  Relaxation Training
Session 7 – 9  Activity Scheduling and Increasing Movement
Session 10 – 12  Understanding and Monitoring Automatic Negative Thoughts
Session 13 -15  Modifying Automatic Negative Thoughts
Session 16 – 18  Addressing Emotional Concerns such as anger, difficulties with inter-personal relationships
Session 19  Sleep Hygiene
Session 20  Relapse Prevention and Booster Sessions

**Mindfulness**

Bringing attention to our thoughts, feelings, bodily sensations, and surrounding environment in each moment.

Develop an “observer-self” perspective that is non-judgmental.

Help patients to notice thoughts without necessarily acting on them, be controlled by them, or believe them.

Identify valued life directions that are intensely personal and significant and can drive actions.
The idea of transdermal patches is as old as man himself. It started with the use of topical application of agents for uses such as medicinal, protection and cosmetic purposes. The earliest available records date back to ~3000 BC. The basic difference between topical and transdermal delivery is relatively local action in the first state and expected systemic absorption and anti-inflammatory action in the latter.

Gradual development of technology and science saw use of cold cream for local effects to nitroglycerine ointment to be used for its systemic effects and then the earliest development of transdermal patch with reservoir to current system which uses a matrix and next generation devices using cutaneous solutions, active patch and microinvasive patch (as described in Fig 1).

**Fig - Transdermal patches: history, development and pharmacology**

**FIGURE**: Historical development of patches. Early topical products: (A) products from ancient times; (B) Galen’s cold cream; (C) mercurial ointment; (D) mustard and belladonna plasters; controlled dosing of topical products. (E) First quantitative systemic delivery (Zondek’s system). (F) Individualized delivery system: nitroglycerin ointment. (G) Topical delivery device (Wurster & Kramer’s system). Passive non-invasive patches. (H) First patch system – the reservoir – introduced for scopolamine, nitroglycerin, clonidine and oestradiol. (I, J, K) Other types of patches – matrix and drug-in-adhesive (e.g. fentanyl and nicotine patches). Next-generation patches. (L) Cutaneous solutions (e.g. Patchless Patch®, Evamist®). (M) Active
patches (e.g. iontophoresis, Zecuity®). (N) Minimally invasive patches (e.g. microneedles, Nanopatch®). (With permission British Journal of Pharmacology)

Earliest developed transdermal patch (1970s) was for delivering Scopolamine for prevention and treatment of motion sickness induced nausea by delivering controlled quantities of drug into systemic circulation manufactured by Alza corporation in a Zafforoni design, to be applied behind the ear. The patch had a drug reservoir and a membrane controlling drug absorption².

Other important development in the history of transdermal patch (TDP) was matrix design patches especially drug in adhesive (DIA) style. The first commercially available DIA patch was nitroglycerine for the treatment of angina pectoris was in late 80s (Nitro Dur II®)³.

The Alza fentanyl patch (marketed as Duragesic® by Johnson & Johnson) initially was drug in reservoir with form-fill-seal system which ran into trouble due to its design. In 2006 patent revealed that fentanyl can leak out of system. Later in 2011, Johnson & Johnson introduced a matrix drug in adhesive patch (DIA) where fentanyl existed in a saturated form in the adhesive⁴.

Advantages of using transdermal patches are relative ease of administration, painless delivery system, improved compliance (long duration patches ~3days), high bioavailability especially for drugs with high first pass metabolism, use in patients where enteral feeding is compromised and generation of less medical waste compared to hypodermic injections.

Use of TDP is not without limitations as it is an expensive route compared to oral; has local side effects like pruritis, erythema; not all drugs can be given through this route and it is difficult to titrate when patients are started on opioid therapy.

Factors affecting rate of drug permeation across the skin is dependent on drug concentration, thickness of skin, partition coefficient between skin and bathing solution.

The rate of permeation across the skin is given by:

\[
\text{dm/ dt} = \frac{D\text{CoP}}{h}
\]

where D is the diffusion coefficient, Co is the constant concentration of drug in the patch, P is the partition coefficient between the skin and bathing solution, and h is the thickness of the skin.

Therefore, a drug to be successful via transdermal route should have low molecular weight, low melting point, affinity for both lipophillic & hydrophillic state, non ionic, short half life & high potency (effectiveness at low concentrations)⁵.

Transdermal patches which are being used for pain management are

1. NSAIDS - diclofenac, ketoprofen
2. Opioids - fentanyl, buprenorphine
3. Local patches- lignocaine, capsaicin

NSAIDS patches, diclofenac (Nupatch® 200 mg 50 cm² 24 hour); ketoprofen (Ketoplast®, Artho-touch®, Infen®) are used for the local and systemic effects, mostly to be applied at the local site of musculoskeletal injury. Mechanism of action is through their anti-inflammatory action by inhibiting prostaglandin synthesis. Indications include soft tissue injuries, epicondylitis, ankle sprain, osteoarthritis and rheumatic arthritis. Side effects are mostly topical pruritus, erythema, burning, allergic dermatitis, but serious adverse skin reactions such as exfoliative dermatitis, Steven Johnson syndrome (SJS), Toxic Epidermal Necrolysis syndrome (TENS) remain a risk. Like all NSAIDs, patches also have a black box warning for increased risk of cardiovascular
events and serious GI adverse effects. Systemic absorption is less as compared to oral consumption. Contraindications include coronary bypass grafting (peri-operative), damaged skin, known asthma/hypersensitivity/ allergy after NSAIDS exposure. It is advisable not to wear patch when bathing or showering; wash hands after application, handling or removing the patch; and to avoid eye contact. It is recommended to avoid concomitant oral NSAIDS.

Opioids are the mainstay for management of cancer pain, as described in WHO ladder for pain management. Step 2 and 3 of WHO ladder advises the use of weak and strong opioids along with adjuvants for the management of mild to moderate, moderate to severe pain respectively. At the time of recommending these guidelines (in 1986) there were no transdermal opioid drug available. Now we have two of the strong opioids which are suitable for transdermal administration by the virtue of the properties (low molecular weight, lipophilic nature, high potency) i.e fentanyl and buprenorphine. Morphine, because of its lipophobic and less potent nature, is not a suitable candidate for transdermal route administration. Both buprenorphine and fentanyl are available in drug in adhesive polymer matrix for continuous drug absorption into systemic circulation. Drug dose delivered by a matrix patch is directly proportional to the area of the patch in contact with the skin. An advantage of matrix style patches is that cutting a matrix patches for titrating doses for paediatrics and elderly patients will not lead to ‘dose dumping’ which can lead to potential overdosing as is seen on cutting a reservoir patch. But ideally TDP (opioids) are best suited for opioid tolerant, stable opioid dose, patients who are unable to take orally, poorly compliant and morphine intolerant patients. Both fentanyl and buprenorphine patches are safe to use in patients with renal failure.

Buprenorphine is a semisynthetic partial μ opioid receptor agonist and at κ and δ opioid receptors antagonist. It is more potent than morphine (20-40 times) and binds to its receptor slowly with high affinity and has a long dissociation curve therefore a long onset & duration of action. Its κ antagonism causes less sedation and less psychomimetic potential in comparison to fentanyl and morphine, hence less chances of dependence and withdrawal. Buprenorphine is available as Butrans® (5/10/20 mcg/hr- 7 day patch) and Transtec® Hapoctasin® (35/ 52.5/ 70 mcg/hr - 4 day patch). In india it is available as Butrans patch (5/10/20 mcg/hr) and is indicated for use in moderate to severe cancer pain, not responsive to non opioids; neuropathic pain with hyperalgesia due to its partial agonist action on ORL1 (opioids receptor like). It is also suitable to use this TDP in opioid naive population. Steady plasma concentration is reached by 200 hours and elimination half life is up to 27 hours.

Fentanyl is a synthetic, highly lipid-soluble, μ-opioid receptor agonist with a low molecular weight. In contrast to buprenorphine, fentanyl has fast receptor association/dissociation kinetics. Fentanyl is 100 times potent as compared to morphine. Fentanyl patches are available in 12, 25, 50 mcg/hr - 3 day formulations. It's steady state is reached by second application and its elimination half life is 13-22 hours. It is metabolised by cytochrome P450 into inactive metabolites. It is advisable to use fentanyl patch in opioid tolerant patients in view of potential serious side effects especially respiratory depression. Opioid TDP have been used in post operative pain, osteoarthritis, rheumatic arthritis safely but primary indication remains cancer pain management.

Usual opioids effects of sedation, nausea, vomiting, constipation, headache, respiratory depression, motor and cognitive impairment are comparatively less with fentanyl TDP as compared to oral morphine. Local site erythema and pruritus is seen sometimes. There is evidence to support equivalent pain control, improved QOL (quality of life), less constipation and reduced need for breakthrough medication as compared to SROM (sustain release oral morphine).

Tips to ensure good patch adhesion-

Patch should be applied on intact dry skin after cleaning with water; avoid oily, irritated and damaged skin. Hair can be clipped. If adhesion, perspiration is problematic, use of a see through dressing is
recommended. Patient is allowed to take bath. Direct external heat, sauna, electric blankets, fever, hypotension and shock can cause irregular absorption of drug.

Lidocaine Patch (5%)

It is available by the brand name Versatis ® approved for use in post herpetic neuralgia and other focal neuropathic syndromes where other antineuropathic are not being helpful. It helps to reduce the pain, allodynia and improves QOL. Lignocaine gets diffused deep into the skin and also the hydrogel acts as a mechanical barrier. Lidocaine 5% plaster exerts its effect by stabilising the neuronal membranes and causing downregulation of neuronal sodium channels.

Each 10cm x 14cm plaster contains 700mg [5% w/w] lidocaine. Painful area should be covered with the lidocaine 5% plaster once daily for up to 12 hours within a 24 hour period. Plaster may be applied during day or night but must be worn for no longer than 12 hours. The minimum number of plasters that demonstrate a therapeutic benefit should be used and no more than three plasters may be used at one time. The plaster may be cut into smaller sizes prior to removal from the liner and should be applied to the skin immediately. After first opening, the sachet (containing 5 plasters) should be tightly sealed and the plasters should be used within 14 days. Most commonly seen adverse reactions are related to local site e.g. burning, dermatitis, erythema, pruritus, rash and skin irritation.

Capsaicin

It is available as Qutenza® (Capsaicin) 8% patch (280 cm² containing 179 mg) for usage in post herpetic neuralgia (PHN) and HIV related painful polyneuropathy. Combined therapy with multiple agents is common in practice because pain of PHN is debilitating and resistant to treatment. It is unique in the treatment of PHN because it is dosed only once every 3 months compared to other treatments that are dosed at least daily. On application it causes enhanced sensitivity and pain followed by decreased sensitivity due to its action causing decreased expression of transient receptor potential vanilloid 1 (TRPV1) on nociceptive neurons in the skin. Studies have indicated that it can cause neurolysis by destruction of epidermal nerve fibers, reinnervation of around 90% is seen at 24 weeks after discontinuation of treatment. Recommendation is to apply for 60 min (1-4 patches), not to be repeated before 3 months. Avoid application on face, scalp area and on broken skin. Pretreatment of application area with local anaesthetic, use of systemic analgesics during and after removal patch, post treatment with cleaning gel for 1 min and icing the area post treatment will result in good experience. Safe removal of patch by inward rolling of adhesive side to prevent aerosolization is advised. Use nitrile gloves when handling or administering the patch as latex gloves do not provide adequate protection. Application site erythema (~60%) and pain (~40%) are consistent side effects. Local site pain is transient but requires systemic analgesic for 24 hours. Around 1 % of patients might require to abandon treatment due to side effects. Transient hypertension, pruritus, edema, nausea are some of the rare adverse events noted. Eye and airway irritation may occur due to aerosolization of capsaicin during patch removal. Once the patch is removed the treatment area may be sensitive to heat, such as hot showers and direct sunlight for a few days.

Abbreviations

TDP (Tran Dermal Patch), DIA (Drug In Adhesive), WHO (World Health Organisation), mcg/hr (microgram per hour), ORL (Opioids Receptor Like), SROM (Sustain Release Oral Morphine), QOL (Quality Of Life), TRPV1 (Transient receptor potential vanillioid 1), ENF (Epidermal Nerve Fibers), NSAIDS (Non Steroidal Anti-Inflammatory Drugs)

References


Rapid advances in neurostimulation therapy and an evidence base in neurostimulation therapy for neuropathic pain have fuelled evolution in expertise among pain physicians. Sacral neuromodulation is effective ammunition in the hands of pain physicians in carefully selected patients with persistent pelvic pain. As the utility of sacral neuromodulation expands in the field of bladder and bowel dysfunction, a pain physician expertise has the potential for contributing significantly in multidisciplinary teams beyond the traditional playing field of pain physicians.

The sacral neuromodulation system (SNS) (fig 1) involves electrical stimulation of the sacral nerves by an implantable stimulating electrode on sacral nerve, which is then powered by an implanted implantable pulse generator (IPG). The electrical stimulation modulates the sacral nerve roots that supply the bladder, bowels, urinary and anal sphincters, and pelvic floor muscles. The intensity, frequency, and other stimulation characteristics can be altered by the external programmer to optimise and regulate the stimulation to achieve the desired clinical effect.

Figure 1: Schematic image of posterior pelvis with SNS lead in S3 foramen connected to an implantable pulse generator (IPG)

Enthusiasts of neuromodulation in pain medicine are well aware of pelvic pain syndromes called by various nomenclatures inclusive of interstitial cystitis, pelvic neuropathic pain, pudendal neuralgia, and proctalgia fugax. The therapy has rewarding outcomes in non-painful conditions as well.

**Indications:**

Refractory clinical states that have not responded to conventional medical or physical therapy is the basic pre-requisite requirement to consider SNS therapy in the following conditions

- **chronic urinary retention (non-obstructive)** - Meticulous attention to ensure ruling out obstructive pathology is essential. The following diagnosis have been proposed Fowler's syndrome, spastic pelvic floor syndrome and bladder hypo/acontractility.
- **Overactive bladder syndrome (functional Urinary voiding dysfunction)** - OAB syndrome is characterized by urgency, with or without urge incontinence in the absence of local or metabolic factors explaining these symptoms. Sacral neuromodulation is an appealing therapeutic modality for symptoms refractory to conventional pharmacotherapy, and is relevant for both neurologic and non-neurologic causes.
- **Bowel dysfunction – incontinence** (chronic constipation – debateable indication – often proximal gut dysfunction)
- **Chronic pelvic pain syndromes** (interstitial cystitis, pelvic neuropathic pain, pudendal neuralgia, and proctalgia fugax)

**Contraindications:**
An identifiable cause for the visceral / urogenital symptoms makes neuromodulation an inappropriate therapy, unless there is no remedial curative therapy for the condition.

- Mechanical outlet obstruction (urinary or faecal)
- No evidence of infection, psychosocial stressors
- A diagnosis requiring frequent MRI surveillance
- Inadequate response to test sacral nerve stimulation
- Patient’s inability to manage a sophisticated device

**Sacral nerve stimulation technique:**

A meticulously selected patients with the right indication commonly undergoes a trail stimulation (test phase) of varying duration (days to few weeks). A satisfactory outcome in the test phase provided therapy sample to identify responders while patient experiences the therapy to determine if long-term therapy is a fruitful and viable option.

**Test stimulation (SNS trial):**

Temporary trial lead (single contact) is placed percutaneously as a day-care / OPD procedure and the electrode is powered by an external stimulator power source. Best therapeutic results are achieved by electrode placement in the S3 foramen. The best stimulation pattern and appropriate lead placement is confirmed by plantar flexion of great toe and bellows like elevation of whole perineum (pelvic floor cranial elevation), tingling sensation in whole perineum. Secure dressing hold the lead in place during the trial stimulation lasting a variable duration based on pattern of patients symptoms, comfort level of patient, aseptic lead insertion site, infrastructure and setup of the implanting unit. The trial stimulation period involves monitoring and adjusting the external pulse generator to identify the optimal comfort level of stimulation and to evaluate therapy. The trial period is completed with removing the trial lead.

**Permanent implantation of SNS:**

A successful trial of SNS therapy via a temporary trial lead is followed by permanent implantation of SNS. This involves a fluoroscopy guided percutaneous placement of a SNS tined lead (fig 2) in S3 foramen. The tined lead has 4 electrode contact points and hence more reliable in achieving nerve stimulation in comparison to the test lead. The tines on the lead as self anchoring outward projections on the lead to hold it in place / minimise migration. The lead is additionally anchored to the lumbosacral fascia through a small incision and subcutaneous dissection. The lead is then connected to the implantable pulse generator (IPG) that is implanted in a subcutaneous pocket usually in the superolateral quadrant of the buttock or iliac fossa abdominal wall.

Figure 2: Special leads designed to anchor lead in the S3 Sacral foramen.

Post implantation programming of the SNS system ensures optimal therapy to achieve sub perceptive / perceptive paresthesia in the perineum avoiding associated motor stimulation. This is achieved telemetrically with an external remote programmer.

**Outcomes:**

**SNS for pelvic pain:**

The use of SNM for pain related to PBS/IC has generally been done for patients with pain related to painful bladder syndromes that have failed multiple previous treatments. Lone provides evidence of some benefit from SNM in terms of reduced pain scores along with improvements in frequency...
and bladder volume in patients with pain related to PBS/IC. The case series/case reports also report broadly similar findings to the RCT. Benefits of SNM for pain were reported at follow-up to 7 years after implantation.\textsuperscript{xv}

**SNS for Overactive bladder:**
SN has become an increasingly utilized option for refractory OAB symptoms. Over the past two decades, SN has continued to gain popularity to relieve refractory OAB symptoms with studies demonstrating that it is an effective treatment with potentially long-term enduring benefits. However, these benefits have been shown to come at the expense of a high rate of adverse events although with comparable (slightly favourable) long-term cost-effectiveness to botulinum toxin A with higher initial cost.\textsuperscript{xvi}

**SNS for faecal incontinence:**
In the two 'parallel group' trials, 53 and 15 participants with faecal incontinence who were in the SNS group experienced fewer episodes of faecal incontinence compared to the control group at 3 and 12 months. In the first crossover trial, 24 participants who completed the trial chose the period of stimulation they had preferred while still unaware whether this was ‘on’ or ‘off’. Nineteen participants who preferred the ‘on’ period experienced 59% fewer episodes of FI per week during the ‘on’ period, and 5 participants who preferred the ‘off’ period experienced 118% more episodes of FI per week. In the second crossover trial, the participants did not experience episodes of FI during either the ‘on’ or the ‘off’ periods. In the third trial, participants experienced 83% fewer episodes of faecal incontinence during the ‘on’ compared with the ‘off’ period. In the fourth crossover trial participants experienced 88% fewer episodes of faecal incontinence during the ‘on’ period compared with the ‘off’ period.\textsuperscript{xvi}

**SNS for constipation:**
In one trial assessing SNS for constipation, two participants reported an increase of 150% in the frequency of passing stools per week, and time with abdominal pain and swelling went down from 79% during the ‘off’ period to 33% during the ‘on’ period. However, in the much larger second trial assessing SNS for constipation, in 59 participants SNS did not improve frequency of bowel movements.\textsuperscript{xvi}

**SNS adverse events:**
Out of the studies reviewed, there was generally a 30%–40% rate of complications within the first 5 years. This has a substantial impact on the patients when the cost of a revision of removal surgery potentially combined with the need to implant a new device.\textsuperscript{xvi}

**Summary:**
Sacral neuromodulation has an evolving list of indications beyond pelvic pain syndromes. A definite role for carefully selected patients especially in overactive bladder syndrome and non-obstructive urinary retention. The expensive therapy is cost effective at 5 years. This presents an opportunity for pain physicians to collaborate in multidisciplinary teams delivering sacral neuromodulation.

**References:**


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DISTRACTION TECHNIQUES-CHANNELISING ENERGIES OF CHRONIC PAIN PATIENT

Dr. Kailas S Waghmare

Introduction:
DISTRACTION means – "TO PULL APART" OR "TO DRAW AWAY" It is cognitive coping skill to focus attention away from pain. IT ALLOWS FOR A FILTERING PROCESS WHERE SOME INFORMATION REACHES CONSCIOUS ATTENTION AND OTHER INFORMATION (PAIN) IS SUPPRESSED. WHEN DISRACTION STOPS, PAIN OFTEN RETURNS AS THE CENTRAL FOCUS OF AWARENESS AND MAY SUBSEQUENTLY BE ACCOMPANIED BY GREATER PAIN (1).

FIRST EXPERIENCE OF DISTRACTION AS PER WESTERN CONCEPT AND SANKHYA CONCEPT (2):

NEWBORNS – GET DISTRACTED AND STOP CRYING BY STIMULATION THROUGH.
1. TOUCH- WARM/COLD VAYU TATVA
2. SOUNDS- MUSIC/WORDS AAKASH TATVA
3. VISION- COLOR/LIGHT AGNI TATVA
4. TASTE- SPECIFIC TASTE OF MILK/FOOD JAL TATVA
5. SMELL- SPECIFIC SMELL OF CARETAKER PRUTHVI TATVA

THESE 5 SENSES HELP IN DISTRACTION PAIN SPECIFIC DISTRACTION IN CHILDHOOD:-
FALL DURING PLAY → CHILD STARTS CRYING AND STOPS PLAYING → CARETAKERS/PARENTS DISTRACT BY GIVING A HUG, MASSAGING AND MOVING THE PART INJURED → ALSO FURTHER INCLUDE MONEY FOR DISTRACTION. CHILD STOPS CRYING → FORGETS PAIN AND STARTS PLAYING AGAIN

HOW THIS HAPPENED?

MECHANISM:

1. HUG (TOUCH AND EMOTION) AND KIND WORDS (HEARING)
2. MONEY (MENTAL) INVOLVEMENT
3. MASSAGE - TOUCH AND PRESSURE RECEPTORS GET ACTIVATED
4. ALSO WARM/COLD RECEPTORS GET ACTIVATED
5. BY MOVING PROPRIORECEPTORS GET ACTIVATED THESE RECEPTORS CONDUCT AT A SPEED WHICH IS MORE THAN SPEED OF RECEPTORS OF PAIN
6. WALL AND MELZACK - GATE THEORY WORKS HERE,
7. AND IT DID WORK BEFORE THEY DESCRIBED IN 1965.

WESTERN TECHNIQUES USED:

1. MENTAL IMAGERY- Useful in Painful Bladder syndrome
2. COUNTING
3. VIRTUAL REALITY- For burns patients
4. WATCH FAVORITE TELEVISION PROGRAM
5. CALL A FRIEND AND CHAT ANYTHING OTHER THAN PAIN
6. READ A BOOK
7. PARTICIPATE IN RELAXING HOBBY SUCH AS CARD MAKING OR KNITTING
8. DO A CHALLENGING WORD PUZZLE
9. LISTEN TO SOOTHING MUSIC
10. PLAY A VIDEO GAME
11. MEDITATE

ALL 1-10 ARE TIME BOUND BUT LAST IS DIFFICULT DUE TO PAIN.
ALSO CHANNELISING ENERGY BY USING ABOVE TECHNIQUES IS INSUFFICIENT COMPARED TO ANCIENT INDIAN TECHNIQUES. ANCIENT INDIAN CONCEPT for MEDITATION (2, 3): PATANJALI YOGA CONCEPT & REMEDIES CAN BE MADE WAY OF LIFESTYLE BY FOLLOWING DISCIPLINE FIRST. Guru is required to get correct knowledge. “YOGASCITTAVRTTINIRODAH.” – CONTROL OF MENTAL MODIFICATIONS CITTA CONSISTS OF –

1. MANAS - DESIRE + FEELINGS
2. MAHAT - DISCRIMINATION POWER
3. AHANKARA – EGO

But using these alone they reach nowhere.

Manas, chitta, prana and antakarana work simultaneously as needed to achieve the GOAL OF SELF REALISATION.

KLESHA – Inborn afflictions

LEAD EACH OTHER TO PAIN

1. AVIDYA – CONSIDERING UNREAL AS REAL - Mahaklesha
2. ASMITA – EGO, POSSESSIVENESS DUE TO AVIDYA
3. RAGA – ATTACHMENT
4. DVESHVA - HATRED / JEALOUSY
5. ABHINIVESHA – FEAR OF DEATH

5 TYPES OF VRIITTI –

“VRIUTTAYAH PANCHTAYYAH KLSTAKLISTAH”. SOME are PAINFUL AND SOME are PLEASURABLE.

1. PRAMAN - RIGHT KNOWLEDGE
2. VIPARYAYA - WRONG KNOWLEDGE
3. VIKALPA - VERBAL ILLUSIONS
4. NIDRA - SLEEP - SILENT MODE
5. SMRITI - MEMORY - STRONGEST

OBSTACLES THAT DISTRACT THE MIND FROM MEDITATION (3)

1. VYADHI – DISEASE
2. STYANA – DULLNESS
3. SAMSAYA – DOUBT
4. PRAMAD – CARELESSNESS
5. ALASYA – LAZINESS
6. AVIRATI – OVER SENSIUALITY
7. BHRANTIDARSHAN – FALSE PERCEPTION
8. ALABDHABHUMIKATVA – FAILURE TO REACH FIRM GROUND
9. ANAVASTHITATVANI – SLIPPING DOWN FROM GROUD GAINED

ACCOMPANIMENTS OF MENTAL DISTRACTIONS

1. DUKHA – SADNESS / DEPRESSION
2. DAURMANASYA – DESPAIR - DEPRESSION ALL THE TIME
3. ANGAMEJAYATVA – TREMBLING OF BODY
4. SVASA – PRASVASA – DISTURBED/IRREGULAR BREATHING

ASHTANG YOGA OF PATANJALI (3)

It is applied in CONTEXT TO PAIN, developed for NEEDLE INDUCED YOGA (NIY), where Acupuncture needles of various sizes are used according to the muscle mass to be covered, in prone position. After keeping needles in for 48 minutes. (4)

Recently Scientists have said that future research will examine how treatments for chronic pain—medications, meditation and cognitive behavioural therapy – affect flexibility in communication within the brain, which may contribute to more personalized treatments for chronic pain.(5) Here I propose that NIY is the painful stimulation which modulates the brain mind complex of the individual patient and affect flexibility in communication within brain, which contributes to more personalised treatments for chronic pain.

1. YAMA : Patient should follow rules for social conduct.
   1. AHIMSA- Non-violence through thought, word and deed.
   2. TRUTH - Patient has to tell Truth regarding the genesis of pain.
   3. ASTEYA - Patient should not treat himself by Stealing concepts of treatment.
   4. BRAMHACHARYA - Abstinence, patient should conserve energy for repair and rejuvenation purposes.
5. APARIGRAHA - Patient should not store pain till it becomes a problem.

2. NIYAMA: Patient should follow the rules of personal conduct.
   1. SAUCHA is cleanliness of body and mind.
   2. SANTOSHA is contentment in whatever relief patient gets from treatment.
   3. TAPA is the pain taken by patient, of the needles to get pain relief. Patient has to take needles in a non-reactive and equanimous way for desensitisation of pain. Remember NO PAIN, NO GAIN.
   4. SWADHYAYA is self-study of pain which patients perceive by NIY.
   5. ISHWAR PRANIDHAN by Surrendering to Almighty and praying for pain relief. Last 3 induce mento-emotional relaxation. Thus patients participate in own treatment and boost self-esteem, self-confidence, feeling of self-worth and capacity to adjust at all levels. (6)
   6. ASANA: As Patanjali described in a verse, "Sthiram Sukham Asana", (3) that is the person’s body, mind and senses are stable and comfortable. In NIY, as needles are inserted in muscles, there is no movement except for respiration. If one tries to move, it’s painful and the person tries not to move. Awareness of body is achieved by patient- Dehadharana and thus brings in complete sthir asana. Asana causes shifts towards Parasympathetic function of Autonomic Nervous System. It results in inward awareness, introspection, tranquility and inner satisfaction.
   7. PRANAYAMA: Pranayama means regulation of breath. As the needles are in muscles, patient cannot take too deep breath and on the other side will feel he is unable to breathe, thus takes breath in a rhythmic manner along with a pause like kumbhaka. This rhythmic breathing after NIY is equivalent to Pranayama. Awareness of breath is achieved by patient – Pranadharana. After NIY the stress over face disappears and glow over the face is observed as seen after Pranayama. (7)
   8. DHARANA: It is fixing the mind on the object of meditation like tip of nose or image of the Deity. Here mind focuses on the needle induced pain. In latest taxonomy, Eudynia is good pain and bad pain. Patient follows Shravana - intent listening helping in Dharana. (6)
   9. DHYANA: It means meditation and consists in the undisturbed flow of thoughts around the object of meditation. Needle induced pain is the pleasant bearable pain which gives internal awareness through controlled stretching and has the capacity to become the object of meditation. One cannot think of other objects when Undergoing NIY. When we talk to patients undergoing NIY, they accept that their mind is 99.9% on the needle induced pain and as a formality are hearing what is being said to them. It is a state of non-judgemental and non-reactive awareness. Meditation enhances sensory feedback due to enhanced awareness, which results in enhanced process of Homeostasis on psycho-physiological level. Patient follows Manana - passive acceptance of needle induced pain, helps in initial stages of Dhyana. (6)
   10. SAMADHI: It is psycho-physiological integration. In Dhyana the act of meditation and the object of meditation remain separate, but here mind is completely absorbed in object of meditation i.e. needle induced pain. Patient follows Nididhyasana - realisation of needle induced pain in totality -Samadhi. (6) Due to NIY many dormant cortical pathways are stimulated by proprioceptive and various receptors, leading to sensory feedback which brings psycho-physiological relaxation and pain relief by reducing stress, anxiety and depression.

Following above principles is like NEW WAVE Cognitive Behavioural Therapy. (6, 9)

Theories that work, may be one or all, for NIY concept:
1. Needles in muscles stimulate sensory cortex homunculus → thalamus and limbic system →Midbrain and PAG descending inhibitory tracts release endogenous opioids → decrease pain. (7)
2. Irritable nerve → muscle contracts → blood vessels compressed → nutritional deprivation → muscle cell death → fibrosis → muscle length shortening → vicious cycle continues → range of motion decreased along with pain.

After NIY → needle breaks fibrosis → elicits a jump sign → muscle grips the needle → 48 min. → Acetyl choline stores depleted at NM junction → loosens grip of muscle over needle → relaxation of musculo-fascial compartment → circulation restored → Substance P washout → pain decreases
3. Also Needle tip stimulates satellite cells at basement membrane of muscle to multiply. This is supported by nutritional supply which was increased due to increase in blood supply containing platelet derived growth factors. It’s like PRP therapy been done within the body. Increase in muscle mass restores muscle length and thus decreases pain and increases range of motion.

NEUROPLASTICITY Concept for Needle Induced Yoga:
1. PAIN TRAVELS AT 30 METERS/SECOND
2. PROPRIOCEPTION, PRESSURE, TOUCH TRAVELS AT 120 METERS/SECOND
3. 50 MINUTES STIMULATION- 50*60= 3000 SECONDS
4. SO PAIN TRAVELS- 30*3000= 90000 METERS= 90 KM
5. AND OTHER SENSATIONS – 120*3000= 360000 METERS= 360 KM
6. SO ACCORDING TO GATE THEORY, OTHER SENSATIONS WIN OVER PAIN SENSATIONS
7. So each needle will act as stimulus
8. SO THEY ARE ABLE TO CHANGE/ DAMPEN THE CIRCUITS OF BRAIN- NEUROPLASTICITY, HELPING IN REDUCING PAIN CIRCUITS AND DECREASING CHRONIC PAIN REMEDIES OFFERED (3)
1. WORK ON SINGLE THOUGHT E.g. In Depression – Jogging
2. HYPERVENTILATION & HOLDING BREATH – BHASTRIKA
3. FOCUS ON ONE POINT AT A TIME – SINGLE POINTEDNESS
4. CONCENTRATE ON ANY JYOTI/LIGHT – TRATAKA
5. MEDITATE ON DETACHED PEOPLE- NOT BOUND BY WORLDLY DESIRES
6. OBJECT OF MEDITATION SHOULD NOT BE OBJECT OF EMOTION
7. GET PEACE IN SLEEP- SAVASANA
8. CITTA PRASADAM - CHANGE IN ATTITUDE
9. KRIYAYOG IT HELPS TO MINIMIZE AFFLICTIONS/PAIN AND ATTAIN SAMADHI
1. TAPA- ACCEPTING PAIN AS A HELP FOR PURIFICATION
2. SWADHYAYA- IS SELF STUDY
3. ISHWAR PRANIDHAN - BY SURRENDERING TO ALMIGHTY
4. GAYATRI MANTRA

References
1. Bonica's textbook - Management of Pain
2. Critical Survey of Indian Philosophy - C D Sharma
3. Patanjali's Ashtanga Yoga - Dr P V Karambelkar,
4. Hathapradipika:A Philosophical Approach - Prof Avinash Waghmare ,
6. Yoga And Mental Health And Beyond - Prof R S Bhogal,
7. Hathapradipika of Svatmarama- Swami Digamberji,
8. IASP taxonomy 2017,
CP/CPPS is defined when pelvic pain is present for at least three of the preceding six months and no other identifiable causes have been detected (Nickel 1999).

CP/CPPS is associated with other functional somatic syndromes such as irritable bowel syndrome, interstitial cystitis, chronic fatigue syndrome and fibromyalgia (Rodriguez 2009; Suskind 2013). Diagnosis is usually based on patient history, physical examination, urinalysis and 2- or 4-glass test (Nickel 2012). Further investigations are performed when considering differential diagnosis.

**Non-Pharmacological Treatment**

- Physical therapy
- Acupuncture and electroacupuncture
- Local Thermotherapy
- Extracorporeal shockwave therapy
- Myofascial trigger point release
- Biofeedback and Behaviour Modification
- Psychological support
- Life style Management
- Injections-LA,BTX-A, Dry Needling
- Interventional Management-
  - Neuromodulation-Sacral nerve stimulation, Pudendal Nerve Stimulation and Spinal cord stimulation.
- Physical therapy techniques include hot or cold applications, positioning, stretching exercises, traction, massage, ultrasound therapy, transcutaneous electrical nerve stimulation (TENS), and manipulations. Pelvic floor training also may be recommended.
- Digital manipulation of the coccygeal ligaments as well as intrarectal manipulation of the pelvic floor muscles
- Electro galvanic stimulation for the treatment of LAS. A low frequency oscillating current applied to the pelvic floor muscles through an anal probe, induces fasciculation and prolonged fatigue, which breaks the spastic cycle and may produce sustained symptom relief
- Acupuncture targets specific cutaneous points representing various internal organs using fine needle insertion and sometimes adding electric current to increase stimulation (electroacupuncture). In animal models electroacupuncture has anti-inflammatory properties and activates analgesic neurotransmitters.
- Locally induced hyperthermia, using transrectal or transurethral procedures, could decrease oxygen free radicals associated with prostatic inflammation (Gao 2012)
- Extracorporeal shockwave therapy: extracorporeal shockwave therapy reduces prostatitis symptoms.
- Myofascial trigger points release targets pelvic floor musculature dysfunction as a potential cause or contributor to CP/CPPS . Trigger Point injections includes Levator ani,coccygeus,obturator internus,and superficial and deep transverse perineal injections. For MFPP Botulinum toxin A is also effective for pelvic floor MTrPs. Dry Needling-May act at sites distant from the active MTrP
- Biofeedback physical therapy and pelvic floor re-education for CP/CPPS patients, leading to a significant improvement of the symptom score. Biofeedback (Transvaginal and Transrectal) techniques focused on voluntary relaxation of external anal sphincter tone,
- Bowel-Bladder Management-Optimal bowel and bladder program is recommended to prevent hypertonicity and subsequent development of MTrPs.
- Psychological treatments could be helpful in all types of chronic pain syndromes Psychophysiological therapy includes reassurance, counselling, relaxation therapy, stress management program, and biofeedback techniques.
The tendinitis (inflammation) hypothesis for chronic proctalgia was tested by steroid caudal block and by pelvic tender point injection of a mixture of Triamcinolone.

Lifestyle modifications: lifestyle modifications may be associated with a greater improvement in symptom.

Interventional Management- Superior and Inferior Hypogasric Block, Ganglion Impar, TAP, Pudendial nerve blocks ,Ilioinguinal-Iliohypogastric and Genitofemoral Nerve Bloick, Selective Nerve Root Block. Depending upon the etiology various interventions can be used. Multiple imagine modalities are used.

REFERENCES

Development of innovative therapies for any condition requires innovative hypotheses regarding aetiopathophysiology of that condition. Chronic pelvic pain is one of the many conditions in chronic pain that has remained recalcitrant to all therapies so far. So probably there is some hitherto unsuspected pathogenetic process in these patients that has never been satisfactorily addressed to ensure success. It stands to reason that novel and innovative therapies have to be developed to treat new pathogenetic mechanisms.

In chronic pelvic pain treatment the hitherto unaddressed factors are,
1. There is a significant neuropathic component to pelvic pain involving central sensitization.
2. This neuropathy appears to involve motor nerves as much as sensory nerves. This motor neuropathy or neuromyopathy appears to generate myofascial trigger points (MTrPs) in intra and extrapelvic as well as back musculature giving rise to referred pains in lower abdomen, axial back, buttocks and thighs. These may further give rise to secondary MTrPs in the distal extremity as well, giving rise to myriad manifestations of pains.
3. This neuromyopathy appears to be the mediator for pain referral from the pelvic viscera to the bodywall and pelvic floor muscles. Involvement of pelvic sphincter muscles have the potential to cause obstructive urogenital (straining dysuria frequency, burning micturition) and rectal symptoms. These obstructive symptoms may assume the form of a painful bladder syndrome/interstitial cystitis/sterile epididymitis/coccigodynia/haemorrhoids/fissures etc.

Following the innovative treatments developed to address the above problems are,
1. A continuous caudal epidural analgesia to attenuate the peripheral sensitization (in the bladder and other pelvic organs) as well as the central sensitization in the spinal cord. This provides almost complete sustained analgesia to all the pelvic viscera as well as the pelvic musculature as long as it is in situ. In our experience this takes a minimum of 15 days hence the catheter has to be tunneled away to reduce the possibility of catheter sepsis. In addition antibiotic, a close supervision of the catheter exit site and weekly blood count to monitor white cell count are necessary.
   1. The obstructive symptoms secondary to pelvic sphincter involvement might require an injection of low dose botox into the pelvic floor muscles.
   2. The MTrps in extrapelvic muscles and back muscles would require ultrasound guided dry needling followed by physical therapy.
   3. Medications like analgesics, antispasmodics and neuromodulators form supportive treatment to the above innovative therapies.
We have been using these therapies with impressive success to treat patients with chronic pelvic pain from endometriosis, painful bladder syndrome/interstitial cystitis/sterile epididymitis/coccigodynia/perineal pains.

References
Anatomical and pain-provocation studies show that severe and chronic back pain most often originates in the lumbar intervertebral discs, the apophyseal joints, and the sacroiliac joints. Psychosocial factors influence many aspects of back pain behaviour but they are not important determinants of who will experience back pain in the first place. Back pain is closely (but not invariably) associated with structural pathology such as intervertebral disc prolapse and endplate fractures, although age-related biochemical changes such as those revealed by a ‘dark disc’ on MRI have little clinical relevance. All features of structural pathology (including disc prolapse) can be re-created in cadaveric specimens by severe or repetitive mechanical loading, with a combination of bending and compression being particularly harmful to the spine.

Structural disruption alters the mechanical environment of disc cells in a manner that leads to cell-mediated degenerative changes, and animal experiments confirm that surgical disruption of a disc is followed by widespread disc degeneration. Some people are more vulnerable to spinal degeneration than others, largely because of their genetic inheritance. Age-related biochemical changes and loading history can also affect tissue vulnerability. Finally the concept of ‘functional pathology’ is introduced, according to which, back pain can arise because postural habits generate painful stress concentrations within innervated tissues, even though the stresses are not high enough to cause physical disruption.
The idea of interdisciplinary pain management has been brought to help the patients suffering from chronic pain conditions in a holistic way. It addresses different facets of chronic pain conditions by involving relevant specialists from various fields working together to give maximum benefit to the patients. But the novel idea of interdisciplinary pain management has its own set of challenges.

Development of interdisciplinary pain management requires a collaborative effort and commitment of the whole team of medical and non-medical care providers towards a common goal i.e. patient centric care and treatment of pain as a pathology and a biopsychosocial problem. The very pivotal idea of interdisciplinary pain management in itself is the biggest challenge to be addressed. Bringing different specialists to work together for a common cause is a herculean task in itself. Involvement of too many health care providers do pose problems in terms of difference of treatment opinions and the lack of understanding about different specialties, all the more increases these differences. So inter disciplinary training and consensual treatment plan is required to be followed to execute an effective implementation of a treatment plan.

It has been claimed that the long term cost incurred on the treatment and functional recovery of the patients from pain is effectively less than what it takes from consulting individual specialists. But many people refute this claim considering the short term pain relief measures available, not taking long term functional recovery into consideration. There have been financial implications from the private insurance companies too, towards the reimbursements of many medical and most non-medical care provided under the concept of interdisciplinary pain management.

Like any great idea is faced with initial challenges and tested over time to be proven worthwhile, the concept of interdisciplinary pain management is no exception. The better understanding of the concept among care givers and the society would pave way for its acceptance as the most effective and complete way to treat chronic pain.
INTRODUCTION

Pain and inflammation are part of the human body’s protective responses and, with negative feedback are generally self-limiting; but left untreated have the capacity to become pathological and may result in conditions that are difficult to manage. Chronic pain is a significant global concern and the immune system is responsible for the development of many chronic pain conditions. The pain could be mediated via autoantibodies, cytokines, chemokines, and other inflammatory mediators (i.e. substance P, histamine, bradykinin, tumor necrosis factor, interleukins, and prostaglandins). Of late research had revealed that cytokine interactions within the brain and spinal cord glia and dorsal root ganglia satellite glia are associated with central and peripheral sensitization of nociceptive processing leading to pain modulation. New insights have emerged with the discovery of specific IgGs which target antigens at extracellular nodal and synaptic structures, causing pain by enhancing neuronal excitability even in the absence of inflammation, known as ‘autoimmune pain’

Opioid peptides are present in the synovial lining cells, macrophages, mast cells and lymphocytes. The main opioid peptides are β-endorphins and metenkephalins while dynorphin is present in very small amounts. Corticotrophin introduced into joint space leads to temporary analgesia which is reversible with naloxone. Likewise the use of naloxone (which would block the opioid receptors) via intra-articular route would result in a significant increase in pain in the postoperative period in patients who have undergone knee surgery. These findings are suggestive of the release of opioids within inflamed tissue which can lessen pain.

Tissue macrophages, dendrites and post tissue injury all lead to the production of inflammatory mediators like bradykinin. This inflammatory reaction is enhanced by the growth factor, cytokines, chemokines and leucocyte migration into the inflamed area and tissue acidification, and lead to a response out of proportion to the heat or mechanical stimuli which normally cause only mild discomfort. This is known as thermal or mechanical hyperalgesia. The source of both analgesic and hyperalgesic mediators are the leucocytes and among the best-characterized and clinically relevant of these are the endogenous opioid peptides (like β-endorphin, metenkephalin, dynorphin, and endomorphins) and receptors.

Opioid tolerance occasionally results in the clinical setting where patients have been administered opioids. Very few studies have been done in this regard. Cancer and inflammatory disorders like chronic arthritis and inflammatory neuropathy are associated with opioid peptide containing leucocytes. Some experimental studies suggest that endogenous secretion of opioid peptides might offset the development of tolerance, and this could be used in long term treatment of inflammatory pain where peripherally acting opioids are
used. Another advantage would be the lack of central side effects of opioids like sedation, nausea and vomiting.

In the meantime chemokine receptor antagonists and mitogen-activated kinase inhibitors are being researched for their role in the treatment of conditions like rheumatoid arthritis, active multiple sclerosis, allergy and cancer. In fact the use of anti-chemokine therapy of inflammatory diseases may have the capacity to aggravate pain.

The immune system plays a pivotal role in the field of pain management via the inflammatory cytokine modulation of the peripheral nociceptive fibers. The IgGs indirectly enhance pain by T-cell-mediated inflammation or destruction of targets within the nociceptive pathways. The IgGs have been involved with several disorders which have neurological manifestations like seizures, myoclonus, spasticity and benefit from immunotherapy. Other pain disorders, like complex regional pain disorder are also associated with IgG but their immune treatment response is less dependable.

Pain sensitivity and the transition from acute to chronic pain are governed by the interaction between glia and immune cells. Post trauma, the resident and blood borne immune cells assemble at the injury site, bestowing not only protection but sensitization of peripheral nociceptors. It is this understanding of the attributes of the immune system with regard to pain processing and modulation that would lead the way to the development of new analgesics and therapeutic regimens for the alleviation of chronic pain.

Reference
Headaches are one of the most obvious and disabling disorders affecting mankind. A significant percentage of the general population report suffering from headaches at one point or the other in their lifetime. It has a major impact on the society in terms of healthcare utilization, economic costs, medications and work loss.

Trigeminal Autonomic Cephalgias are a unique group of headache disorders classified by the International Headache Society based on unique set of characteristics such as unilateral trigeminal distribution pain that occurs in association with ipsilateral cranial autonomic features. This group of headache disorders includes cluster headache, paroxysmal hemicrania, short-lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing (SUNCT), short-lasting unilateral neuralgiform headache attacks with cranial autonomic symptoms (SUNA), and hemicrania continua. Although these disorders share a similar phenotype, they are distinguished by differences in attack frequency and duration.

Being relatively rare and poorly understood, they represent a clinical challenge, leading to underdiagnosis and undertreatment. Delays in diagnosis are typical and treatment options remain suboptimal, associated with limited scientific research into these brain disorders. Improved familiarity with core clinical features by health care providers should lead to earlier referral to specialists.

The lecture outlines the clinical manifestations, differential diagnoses, diagnostic workup and the treatment options for each of these syndromes. The first-line treatments of TACs have not changed in recent years: cluster headache is managed with oxygen, triptans, and verapamil; paroxysmal hemicrania and hemicrania continua are managed with indomethacin; and SUNCT and SUNA are managed with lamotrigine. Oxygen is reported by survey respondents to be a highly effective treatment with few complications in cluster headache in a large international sample, including those 65 years or over. Triptans are also very effective with some side effects, and newer medications deserve additional study. However, recent advances have provided additional options for patients with TAC. Patient selection for these devices is key to successful treatment.

References

Introduction

Fibromyalgia and myofascial pain syndromes (MPS) are among the most common musculoskeletal disorders. These disorders represent opposite ends of the pain spectrum with the discrete character of MPS at one extreme and the widespread symptoms of fibromyalgia at the other. These disorders may coexist and patients with fibromyalgia often have coexisting MPS. MPS may be acute or chronic, and is associated with taut muscle bands and hypersensitive areas called trigger points. Fibromyalgia syndrome includes symptoms of sleep disruption, fatigue, and psychological distress in addition to widespread pain. Both fibromyalgia and MPS may result in significant functional impairment and cause suffering and disability. Appropriately targeted history and physical examination is important for diagnosis of these disorders.

Myofascial Pain Syndrome

Myofascial Pain Syndrome (MPS) is a regional pain syndrome with manifestation of sensory, motor and autonomic symptoms caused by myofascial trigger points (MTrP).

MTrP is best defined as a hyperirritable spot in the skeletal muscle that is associated with a hypersensitive palpable nodule in a taut band. The spot is painful on compression and can give rise to a characteristic referred pain and tenderness pattern.

Diagnostic Criteria

There is no laboratory test or imaging technique has been established as diagnostic of MPS. The diagnosis is dependent upon eliciting a detailed history, exhaustive physical examination with manual palpation. Some muscles are particularly difficult to evaluate manually because of their deep anatomical locations. Simons and Travell have proposed diagnostic criteria for identifying myofascial trigger points which describes essential criteria for palpation of trigger points and confirmatory observations during examination.

Palpation of a MTrP’s taut band or penetration with a needle usually induces a local twitch response (LTR). The LTR is due to the transient reflex contraction of a group of tense muscle fibers that traverse a trigger point which is also called as a “jump sign.” Deep palpation of active MTrP leads to a familiar induced discomfort to a predictable area of reference. In latent MTrP there is no current experience of spontaneous pain, but pain is induced with palpation over the tender spot. A latent MTrP may have all the other clinical characteristics of an active MTrP and always has a taut band.

MPS is associated with autonomic dysfunction like sweating, persistent lacrimation, coryza, excessive salivation, and pilomotor activities. There can be proprioceptive disturbances such as imbalance, dizziness, tinnitus, and distorted weight perception of lifted objects.

Several modalities have been studied to identify MTrPs. Thermography is a science that records infrared radiation to produce images called thermograms. Based on asymmetric thermal patterns, MTrPs and their referral areas are localized. The use of ultrasound to identify MTrPs can be useful. Needle electromyography (EMG) detects the presence of spontaneous low voltage motor endplate “noise” activity, as well as the high voltage spike activity that is highly characteristic, but not pathognomonic, of MTrPs.

USG in combination with EMG can give better imaging for clinical diagnosis of MPS. Measurement of levels of biochemical substances associated with pain and inflammation in the MTrP region and magnetic resonance elastography to detect taut band images are potential tools. However, most of these methods require special skills and are relatively expensive at this time.

Pathogenesis

MPS results from the activation of latent MTrPs, as a consequence of certain pathological conditions and predisposing factors such as chronic repetitive minor muscle strain, poor posture, systemic diseases, or
neuro-musculoskeletal lesions. These triggering pathologic lesions are usually found in regions remote to the latent MTrP. Exploration of MTrP with needle electromyography (EMG) has shown spontaneous electrical activity (SEA) which gets eliminated after local infusion of phentolamine. Based on this finding, it has been suggested that MTrPs have adrenergic dependency.

Recent studies have clarified the nature of MTrPs. In a MTrP region, multiple hyperirritable loci can be found. The sensory components of the MTrP locus are due to sensitized nociceptors that are responsible for pain, referred pain, and local twitch responses. The concentrations of pain and inflammation-related substances such as bradykinin, calcitonin gene-related peptide, substance P, alpha tumor necrosis factor, interleukin 1-beta, serotonin, and norepinephrine are increased in the MTrP region.

**Treatment**

The most important strategy to treat MPS is to identify and treat the underlying etiological lesions appropriately. MTrPs due to muscle over-activity can be managed with avoidance of overuse or inappropriate use. Treatment (inactivation) of active MTrPs is necessary. Release of muscle tightness due to taut bands may improve the local circulation to facilitate the healing process of the underlying etiological lesion. Conservative treatment should be performed before more aggressive therapy.

The commonly applied MTrP therapies include intermittent cold and stretch (spray and stretch), topical anesthetic patches, deep pressure soft tissue massage, trigger point injection, dry needling, acupuncture, ultrasound therapy. Other treatment modalities are trigger point pressure release, post-isometric relaxation, thermotherapy, and electrotherapy.

Dry needling is as effective as injection of an anesthetic for relief of MTrP symptoms if the needle elicits a LTR. If no LTR occurs, dry needling and injection of anesthetics are equally ineffective. Hence, there is essentially no difference in the effectiveness between dry needling and local anesthetic injection. Isotonic saline injection has been found to be equal to local anesthetic injection. Corticosteroids are used for MTrP injections assuming a chronic mechanical stress to the muscle may produce aspects of an inflammatory reaction. The use of long acting steroids, however, is not recommended for the injection of MTrPs, as they, by themselves, may be destructive to muscle fibers. MTrP injection with Botulinum toxin has been recommended to treat MTrPs. However, some recent studies found no significant benefit from Botulinum toxin injection compared with dry needling or bupivacaine injection. Considering the cost and risk of Botulinum toxin injections, it is not routinely recommended. Laser therapy is also used to treat MTrPs with beneficial effects like circulation enhancement, collagen proliferation, peripheral nerve stimulation, anti-inflammatory and direct analgesic effect. Shockwave therapy and Hyperbaric oxygen is a newly developed device for treating MTrPs.

**Fibromyalgia Syndrome**

Fibromyalgia syndrome (FMS) is a chronic condition presents with widespread pain, fatigue, dysfunctional sleep and cognitive disruption. 2–12% of the general population is affected in developed countries, it increases with age (more than 7% in age over 70). Women are 4–7 times more likely to be affected than men.

**Diagnosis**

The first clinical criteria for the diagnosis of FMS was set in 1990 by the American College of Rheumatologist (ACR). It was based on widespread body pain (defined as the pain affecting both sides of the body above and below the waist) for at least three months plus tenderness in at least 11 out of 18 tender points. In 2010, these criteria were updated to change the focus towards a subjective widespread body pain index (WPI) and symptom severity scale (SS), taking into account cognitive symptoms, sleep, fatigue and additional somatic symptoms.
A multi-center research study has led to the development of research criteria for the classification of FMS by the American College of Rheumatology. Presence of Chronic, widespread (four quadrants) soft tissue pain for at least 3 months, induced by 4 kg of digital palpation pressure at 11 of 18 anatomically defined tender points (TepPs) shows more than 80% sensitivity and specificity for FMS. Subsequently New modified Clinical Fibromyalgia Diagnostic Criteria developed. According to this The fibromyalgia severity (FS) scale is the sum of the Widespread pain index (WPI) and symptom severity scale (SSS).

Patients should take following points into consideration and questions to calculate the score.
• How you felt the past week,
• While taking your current therapies and treatments, and
• Exclude your pain or symptoms from other known illnesses such as arthritis, Lupus, Sjogren’s.

<table>
<thead>
<tr>
<th>Check each area you have felt pain in over the past week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoulder girdle, left</td>
</tr>
<tr>
<td>Shoulder girdle, right</td>
</tr>
<tr>
<td>Upper arm, left</td>
</tr>
<tr>
<td>Upper arm, right</td>
</tr>
<tr>
<td>Lower arm, left</td>
</tr>
<tr>
<td>Lower arm, right</td>
</tr>
<tr>
<td>Hip (buttock) left</td>
</tr>
<tr>
<td>Hip (buttock) right</td>
</tr>
<tr>
<td>Upper leg left</td>
</tr>
<tr>
<td>Upper leg right</td>
</tr>
</tbody>
</table>

Count the number of areas checked and enter your Widespread Pain Index (WPI) score here ___ (0-19)

Symptom severity (SS) scale score (0-12)

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>No problem</th>
<th>Slight or mild problems</th>
<th>Moderate; considerable problems; often present and/or at a moderate level</th>
<th>Severe: pervasive, continuous, life disturbing problems</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Waking</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>refreshed</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somatic</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>symptoms</td>
<td>(experienced in last 3 months)</td>
<td>1 (1-3 symptoms)</td>
<td>2 (4-7 symptoms)</td>
<td>3 (&gt; 7 or equal to 7 symptoms)</td>
<td></td>
</tr>
</tbody>
</table>

Total SS score

Somatic symptoms might be any symptoms like muscle pain, headache, dizziness, tinnitus, anxiety, depression, numbness/tingling, cold sensitivity, swollen feeling, stiffness, dysmenorrhea, irritable bowel syndrome.

The fibromyalgia severity (FS) scale is the sum of the WPI and SSS

A patient meets the diagnostic criteria for fibromyalgia if the following 3 conditions are met:

1a. The WPI score is greater than or equal to 7 AND the SS score is greater than or equal to 5

OR

1b. The WPI score is from 3 to 6 AND the SS score is greater than or equal to 9.
2. Symptoms have been present at a similar level for at least 3 months.

3. You do not have a disorder that would otherwise explain the pain.

**Physiological and Structural Differences Between Myofascial Trigger Points and Tender Points of Fibromyalgia (ACR (1990))**

<table>
<thead>
<tr>
<th>Trigger Points of MPS</th>
<th>Tender Points of FMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Asymmetrically distributed in the body</td>
<td>1. Symmetrically distributed in the body in anatomic defined locations</td>
</tr>
<tr>
<td>2. Located in muscles</td>
<td>2. Not necessarily located in muscles</td>
</tr>
<tr>
<td>3. Refer pain with manual palpation</td>
<td>3. Do not refer pain with manual palpation</td>
</tr>
<tr>
<td>4. Evidence of histologically abnormal tissue</td>
<td>4. No evidence of histologically abnormal tissue</td>
</tr>
<tr>
<td>5. Specific number of MTrPs is not required for diagnosis of MPS</td>
<td>5. Diagnosis of FM requires 11 out 18 tender points</td>
</tr>
</tbody>
</table>

**Pathogenesis**

The etiology of FMS is still unknown. Multiple theories have been suggested with a transition from a psychiatric process to a muscle disorder, to a genetically predisposed central nervous system dysfunction. Recently, significant progress in the understanding of the pathophysiology (and identification of effective treatments) of FMS has been made. Currently, FMS is described as a condition of increased generalized sensitization to sensory input manifesting as a group of symptoms, including widespread pain. The pathophysiology may include dysfunction of the central nervous system (CNS) pain modulatory systems, dysfunction of the neuroendocrine system and autonomic dysfunction.

Central sensitization of nociceptive afferent pathways creating a stimulus-independent pain state has been proposed. It is felt that alterations in the level of CNS substance P, the volume of N-methyl-D-aspartate acid receptors, and the CNS mono-aminergic activity levels are responsible for this sensitivity in the FM patient. Genetic predisposition is also suggested in Diagnosis of FMS.

**Treatment**

The management of FMS has been complicated by an overlap of this syndrome with symptoms of other health conditions (e.g., chronic fatigue syndrome, myofascial pain, systemic lupus erythematosus). Treatment recommendations from the American Pain Society and the European League Against Rheumatism have been published. But universally accepted treatment strategy or algorithm is lacking. Current management approaches to improve the overall health status in FMS is based upon a multidisciplinary approach. The objectives are to reduce pain, improve sleep, restore physical function, maintain social interaction, and reestablish emotional balance. To achieve these goals, patients will need rehabilitation, integrating exercise, education (stress management programs, cognitive behavioral therapy (CBT)) along with pharmacological treatments.

The most recent guidelines from European League Against Rheumatism (EULAR) (2016), Canadian Pain Society (2012), and The Association of the Scientific Medical Societies in Germany (AWMF) (2012) highlight the change in attitudes regarding the overall approach to FMS, but offer varying advice with regards to the use of pharmacological agents. Amitriptyline, Pregabalin and Duloxetine are used most commonly in FMS but they are most beneficial with non-pharmaceutical measures.
Initial management should involve patient education and focus on nonpharmacological therapies. In case of non-response, further therapies (all of which were evaluated as “weak for” based on meta-analyses) should be tailored to the specific needs of the individual and may involve psychological therapies (for mood disorders and unhelpful coping strategies), pharmacotherapy (for severe pain or sleep disturbance) and/or a multimodal rehabilitation programme (for severe disability).

Pharmacologic Therapies

1. Antidepressants

Antidepressants, particularly tricyclic antidepressants (TCAs) such as amitriptyline have been first-line pharmacological therapies for FMS. Recently, new selective serotonin reuptake inhibitors, such as paroxetine, and serotonin-norepinephrine reuptake inhibitors, such as duloxetine, milnacipran, venlafaxine have become popular.

Tricyclic Antidepressants

Amitriptyline and duloxetine are recommended in the case of comorbid depressive disorders or generalized anxiety disorder. Off-label use of duloxetine can be considered even if there is no comorbid mental disorders.

Studies reported (Häuser et al, Nishishinya et al, reported that patients receiving amitriptyline (10-50mg/day) were more likely to achieve 30% pain reduction with moderate effect on fatigue. 25 mg/day (low dose) improved pain, sleep and fatigue at 6–8 weeks of treatment while 50 mg/day did not demonstrate efficacy.

Serotonin–Noradrenalin Reuptake Inhibitors (SNRI)

Duloxetine (FDA approved for fibromyalgia)

Serotonin (5-HT) and noradrenalin have been implicate in the mediation of the descending pain inhibitory pathways, which have in turn been linked to the pathophysiology of FMS. Duloxetine has a five-fold stronger effect on serotonin than on noradrenalin. It is recommended that Duloxetine (60 mg/day) for patients with comorbid depressive disorder, with or without general anxiety disorder. Duloxetine dose and length of therapy is guided by patient response and side effect profile. However, Duloxetine 20–30 mg/day has not shown to be effective, and no difference was found between 60 mg/day compared to 120 mg/day. The largest review of 2249 subjects reported duloxetine, short term (12 weeks) and long term (up to 28 weeks), was more effective than placebo at reducing pain.

Milnacipran (FDA approved for fibromyalgia)

Milnacipran has three-fold stronger effect on noradrenalin than serotonin. It is recommended by EULAR and has been shown to be effective, though Duloxetine was found to be superior to Milnacipran in reducing pain and sleep problems. AWMF (german) guidelines do not recommend the use of MLN. This is based on low quality evidence, with low acceptance amongst patients and high risks of side effects. There is not enough available evidence with regards to the use of other agents such as venlafaxine in the management of FM. Seven systematic reviews were identified of milnacipran, a recent one of which evaluated five trials. Patients taking milnacipran showed to have 30% pain reduction at the end of treatment but there was no effect on sleep.

2. Anticonvulsants

Anti-epileptic drugs have also been administered and shown to be effective (or have been used) in the control of symptoms. Both gabapentin and pregabalin block the α2δ subunit of the presynaptic calcium channels leading to a decreased neurotransmitter release and attenuation of abnormal hyperexcitability of the neuronal networks associated with chronic pain. They both improve pain scores and sleep quality. Benzodiazepines have given inconsistent results in clinical trials in patients with FMS.
**Pregabalin** (FDA approved drug for fibromyalgia)
A recent Cochrane review reported patients receiving active treatment with Pregabalin were more likely to have 30% pain reduction. There was a very small effect on fatigue and small effect on but no effect on disability. A single, moderate quality, study of gabapentin in 150 subjects showed a significant effect on 30% pain reduction a small effect on sleep and a large effect on disability.

3. **NSAIDs**

Use of NSIADs for the management of FMS symptoms are not recommended by EULAR and AWMF. These recommendations come from a small number of studies. NSAIDs in combination with other medications may provide some analgesia.

A recent Cochrane review on NSAIDs in FMS also came to the same conclusion. However, the Canadian guidelines, though not directly supporting their use in FMS, recommend using this group of drugs with the lowest possible dose for the shortest possible times in concurrent conditions such as osteoarthritis. Acetaminophen’s actions, such as modulating the endogenous cannabinoid system and serotonin receptor agonist, may be beneficial in FMS. There is no direct evidence with regards to the use of acetaminophen in FMS though it has been used in combination with tramadol.

4. **Sleep & anti-anxiety medications** - trazodone, benzodiazepines, L-dopa & carbidopa
5. **Trigger point injections** in patients with co-existent myofascial pain
6. **Growth hormone**

A single systematic review of two studies involving 74 patients reported an effect size on pain of fibromyalgia. The improvement in functional deficit was not statistically significant. There are concerns on safety (sleep apnoea, carpal tunnel syndrome). The drug is not approved for fibromyalgia (FM) or related disorders in Europe.

7. **Monoamine oxidase inhibitors**

Four reviews identified up to three studies and 241 patients. Häuser et al reported a moderate effect on pain across the Studies. There was no comparison between compounds. Life-threatening interactions have been documented.

8. **Sodium oxybate**, the sodium salt of gamma-hydroxybutyrate, provided significant improvement in the major symptoms of FMS (i.e., pain, tenderness, sleep quality, and fatigue), which has been largely attributed to its capacity to consolidate and improve deep sleep

9. **Opioids** can be tried only after all other pharmacologic and non-pharmacologic therapies have been exhausted. Clinical trials of opioid agonists as treatment for FMS have been limited and often ineffective.

10. **Tramadol**, a weak opioid with mild serotonin-noradrenaline reuptake inhibitor (SNRI) activity was considered by two reviews. Roskell et al. identified a single study of tramadol with paracetamol. Those in the active arm were more likely to have 30% improvement in pain.

The literature search did not identify any reviews on corticosteroids, strong opioids, cannabinoids and antipsychotics. The committee made a ‘strong against’ regarding the use of strong opioids and corticosteroids inpatients with fibromyalgia on the basis of lack of evidence of efficacy and high risk of side effects/addiction reported in individual trials.

11. **Lignocaine infusion**

Role of lignocaine infusion in fibromyalgia is assessed in few studies. They used lignocaine in doses ranging form 2mg/kg – 5mg/kg in Normal saline for 5 consecutive days. They noted statistically significant improvement immediately after the fifth infusion and 30 days afterward in visual analog scale pain scores and Fibromyalgia Impact Questionnaire scores. The treatment was well tolerated with no adverse side effects reported. But chronic serial IV lidocaine infusions is warranted in fibromyalgia patients and this intervention should be strongly considered for patients who have not achieved satisfactory relief with more traditional treatment.

12. **Ketamine infusion** The NMDAR plays a prominent role in the pathophysiology of fibromyalgia. Increased activity NMDAR in fibromyalgia and its modulation (reduction) becomes a important treatment option in management of fibromyalgia. A literature of Low-dose intravenous ketamine and oral memantine both show clinically useful benefit in fibromyalgia. S8
patients in 3 studies with fibromyalgia, 33 (57%) responded to low dose ketamine (0.3 mg/kg) infusion, as defined by a reduction of pain by 50% or more.

However, consideration of side-effects, logistics and cost need to be factored into management decisions regarding use of these drugs in this clinical setting. Overall benefits with current NMDAR antagonists appear modest and there is a need for better strategy trials to clarify optimal dose schedules and to delineate potential longer-term adverse events.

**Selected NMDAR antagonists used in Fibromyalgia**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Analgesic Dose</th>
<th>Side Effects</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ketamine</td>
<td>IV: 0.2–0.75 mg/kg Continuous infusion: 2–7 mcg/kg/min</td>
<td>Psychomimetic—hallucinations, confusion, sedation, irrational behaviour</td>
<td>No studies of higher dose, longer duration regimens limit use.</td>
</tr>
<tr>
<td>Dextromethorphan</td>
<td>Oral: 45–400 mg/day</td>
<td>Drowsy, dizzy, anxiety, confusion</td>
<td>Few clinically useful studies, anecdotal use suggests limited effect.</td>
</tr>
<tr>
<td>Memantine</td>
<td>Oral: 10–30 mg/day</td>
<td>Hypertension, dizzy, drowsy, nausea, anxiety, hallucination</td>
<td>Further studies may show this drug to be clinically useful.</td>
</tr>
</tbody>
</table>

**Nonpharmacologic Therapies**

- Patient education about fibromyalgia syndrome and treatment options, and pain management self-management programs
- Cognitive-behavioral therapy
- Aerobic exercise
- Clinician-assisted treatment, such as clinical hypnosis and biofeedback, acupuncture, chiropractic manipulations, therapeutic massage, and balneotherapy
- Heated pool treatment with or without exercise is effective in fibromyalgia
- Individually tailored exercise programs, including aerobic exercise and strength training can be beneficial to some patients
- Cognitive behavioral therapy may be of benefit to some patients with fibromyalgia

Other therapies such as relaxation, rehabilitation, physiotherapy and psychological support may be used depending on the needs of the individual patient

Good outcomes have been reported with a number of forms of relaxation training including electromyography biofeedback, heart rate variability biofeedback, meditation-based stress reduction, tai-chi, and yoga therapy.

Progressive exercise, Jacobson progressive relaxation therapy, and heat applied as a shower or bath can all be self directed treatments. CBT provides improvements in pain-related behavior, coping strategies and overall physical function in patients with FMS.

**References**


INTRODUCTION: Older age group persons tend to have multiple illness. So they take more drugs and polypharmacy, increases the risk of poor outcomes. The number of medicines a person takes, there is a risk factor like adverse reactions, nonadherence, financial burdens, drug interactions and worse outcomes.

MECHANISM ALTERATIONS OF PHARMACOKINETICS IN ELDERLY PERSONS:
Absorption: Hydrochloric acid reduction in stomach, gastrointestinal blood flow reduction, gastric motility and emptying decreases, reduction in lung alveolar surface area. Distribution: Cardiac output reduction, total body water reduction that leads to increase concentration of hydrophilic acid. Decrease in lean muscle mass further reducing volume of distribution for hydrophilic drugs. Increase in adipose tissue, increasing distribution and half-life of lipophilic drugs. Albumin plasma concentrations decreases which leads to increase in pre-plasma concentration of drugs. Hepatic Metabolism: Hepatic blood flow reduction and also hepatic enzymes affecting phase 1 metabolism. Renal Clearance: Renal blood flow reduction, 35-50% reduction in renal function. Risk Factors For Adverse Drug Reactions: Patients over the age of 85 years, female gender, low body weight, renal impairment, dementia, use of multiple prescribing healthcare workers/pharmacies, use of six or more medications.

THE 2015, BEERS CRITERIA: SELECTED DRUGS TO AVOID IN ELDERLY:
Antihistamines- diphenhydramine – avoid, Antiparkinsonian agents- benztropine- avoid, Antispasmodics-hyoscyamine- avoid, Antidepressants-amitriptyline- avoid, Antipsychotics- (conventional or atypical) avoid except for schizophrenia, bipolar disorder, Skeletal muscle relaxants- methocarbamol- avoid, Benzodiazepine- lorazepam- avoid, Nonbenzodiazepine and benzodiazepine hypnotics- zolpidem- avoid, NSAIDS- Diclofenac, aspirin>325mg- avoid, Proton pump inhibitors- Avoid using for >8 weeks, Opioids- pentazocine- avoid

PRACTICAL GUIDELINES WHEN PRESCRIBING TO ELDERLY: Take thorough medical history, and accurate drug history including non-prescription drugs. Take a thorough social history. Psychological effects of ageing to be taken to account like reduced renal function, kidney function, body composition. For long term drug treatment- low dose to be started and slowly it can be increased. Communication with other health workers to remove conflicting treatment on advice. Drug regimens to be simplified and try to comply dose timings with other current therapies if possible- pill organiser to be considered. Refer a publication and possible drug interaction and the impact of renal and hepatic disease to be checked.

CONCLUSION: Screening tools like the BEERS list can be helpful for patients. All drugs have the potential to harm, not the ones on the BEERS list. Prescribing and drug use in the elderly can be improved if we carefully consider the patient specific benefits and risks of medications. So drug related harms can be avoided.
Critical Limb Ischaemia (CLI), in peripheral arterial occlusive disease due to atherosclerosis, is a condition in which there is limb pain at rest, with or without the risk of losing the limb. Spinal cord stimulation (SCS) may benefit patients in Fontaine Stage III or IV, where surgery (open or endovascular) has failed or surgery is not justified or when the patient is unsuitable for surgery. The prognosis in CLI, where only conservative management was offered, was that within six months 20% of CLI patients had died from various causes, 35% were alive with amputation, and 45% were alive without amputation. The Holy Grail of therapy in CLI, therefore, is the trifecta of pain relief, ulcer healing and limb salvage, and SCS - by restoring pulsatile blood flow to the distal extremity – has evidence that it might have a significant role in all three.

A complex interplay of mechanisms are involved in SCS wherein facilitation of vasodilation through its effect on endothelial cells and vascular smooth muscle along with inhibition of vasoconstriction improves peripheral blood flow, and effects on the pain gating mechanism and release of endogenous opioids enhances pain relief. Studies have shown that the clinical improvement with SCS was in the domains of pain relief, exercise tolerance, cutaneous and muscle blood flow, limb salvage rates, wound healing and quality of life. These effects were more pronounced in nondiabetic patients, in diabetic patients without autonomic neuropathy, and in patients with rest pain or ulcer more often than in patients with gangrene. When an objective measure like transcutaneous oxygen (tcpO₂) was used in the decision making process for SCS the results were better, suggesting that pre-implant microcirculatory perfusion is critical for the success of SCS.

The complications of SCS include lead migration and lead breakage, infections at implantation site, electrode connection and abdominal pocket, unwanted stimulations, hardware malfunction and allergy to metal. The average overall costs at two years after SCS were found to be EUR 36,500 in the SCS group and EUR 28,600 in the conservative treatment alone group, suggesting that it is an expensive option from a cost-effectiveness perspective. The higher expenses, however, appear well justified in the face of amputation that may result in depression, phantom limb pain, stump complications, postoperative recovery, rehabilitation and loss of mobility. Spinal neuromodulation, in summary, is an effective therapy option in the management of patients affected by non-reconstructable chronic critical limb ischemia.
Neuromodulation is an exciting modality offering alleviation of pain in a number of chronic, intractable, severe pain conditions which fail to respond adequately to conservative medical management. In simple terms it brings about modification or modulation of the nociceptive signals along the pain pathway reaching the pain perception areas in the sensory cortex and thereby reduce pain intensity. This minimally invasive advanced pain therapy involves implantation of a special device in the body to target one or more structures responsible for nociception to provide ongoing and effective analgesia.

There are two broad categories namely Electrical neuromodulation (using electrical energy) and Chemical neuromodulation (using drug delivery at the target receptors). We shall only discuss electrical or neurostimulation in this write up.

Amongst the electrical Neuromodulation therapies, the most relevant to the Pain physicians is Spinal Cord Stimulation [SCS] which is used in managing chronic severe intractable low back +/- leg pain or intractable neck +/- arm pain in select patients. This modality has been increasingly used over the past two decades with more refined and improved hardware technology to enable tailored stimulation.

Although the exact mechanism for pain control from SCS is not entirely understood, it is believed to result from direct or facilitated inhibition of pain transmission. The gate control theory motivated Shealy et al to apply SCS as a means to antidromically activate the tactile myelinated A-β fibers through dorsal column stimulation and initiate the era of neurostimulation which has progressed significantly with better understanding about the possible mechanisms.

The success of the therapy is based on a multitude of factors. Proper patient selection is the key besides having a skilled and meticulous implanter. It is an elaborate process requiring detailed evaluation and discussion with the concerned patient and due diligence to choose the most appropriate target and hardware.

The most common indications for SCS are neuropathic pain due to Failed Back surgery syndrome, CRPS -I and II, Post herpetic neuralgia, Phantom pain, Peripheral Vascular Disease/ Angina. In the recent times there are many emerging indications such as Migraine/Occipital Neuralgia, Postsurgical pain, Diabetic Neuropathy, Chronic Pancreatitis and many more…..with encouraging results.

It is minimally invasive and reversible therapy as opposed to the other techniques for nerve ablation. It is performed in two stages namely 1) a trial or testing phase and 2) permanent implantation. The implantation is preceded by a trial during which the patient can experience the degree of pain relief, the system is likely to offer. Once the patient is fully convinced the second stage of permanent implantation is performed. Use of SCS involves thorough understanding of the system by the patient as they have to take active participation in its titration based on their requirement.

There are two basic components of the system implanted in the patient’s body.

1) **Lead**- positioned in the epidural space or DRG in the spinal canal or peripheral nerve or ganglion as necessary. It
generally delivers pleasant paraesthesia to replace the painful sensation.

2) **Implantable pulse generator or IPG [similar to cardiac pacemaker]** to generate low-level electrical impulses that stimulate targeted area. This is placed just under the skin in a practical location that is accessible to control by Physician and the patient. One or more leads are connected to the IPG or receiver.

A trial with a percutaneous lead is mandatory to determine the suitability of the patient for the system which is equivalent to feeling of test-driving a car before buying. If successful, the same trial lead can be connected to the battery or a surgical lead can be placed for permanent stage. The trial is performed in sterile setup with fluoroscopic guidance under local anaesthesia so patient can actively participate in helping the doctor map the pain area. At our center, we have a multidisciplinary setup with vast experience of placing percutaneous as well as surgical lead with pacemakers and their programming.

A variety of leads and implantable pulse generators (IPG) are available and the choice is majorly based on the pain profile of the patient. There is a need for titration and programming to get the best possible coverage of the patient’s pain geography and thereby successful outcome.

The success of the therapy involves effective titration with multiple programming options set by the physician to obtain optimum control of the pain. The patient is able to switch between programmes with the help of a special handheld device (like a remote control) and adjust the level and type of stimulation tailored for different pain areas, at different times of the day paired with the IPG.

There are novel implantable power technologies or skin-based power sources, novel programming techniques to further optimize desired paresthesia capture, novel frequency bandwidths to stimulate subthreshold perception, and novel targets for stimulation, such as the DRG, the medial branch of the dorsal ramus, or the cluneal nerve. These have currently offered promise in prospective studies and more evidence is awaited.

There are other varieties of neurostimulation targets such as peripheral nerve stimulation (Occipital, Inguinal, Suprascapular etc) or Intracranial neurostimulation. It is most frequently delivered by stimulating the motor cortex (MCS), the sensory thalamus (DBS), or the periaqueductal and periventricular gray matter. MCS has shown particular promise in the treatment of trigeminal neuropathic pain and central pain syndromes. DBS may be employed for a number of nociceptive and neuropathic pain states, including cluster headaches, chronic low back pain, failed back surgery syndrome, peripheral neuropathic pain, facial deafferentation pain, and brachial plexus avulsion pain. Sacral neurostimulation is indeed a fascinating option for pelvic, perineal pain, coccydynia and interstitial cystitis pain.

Thus Neurostimulation is a promising and rapidly evolving, non-pharmacological modality for refractory severe chronic pain in this era of growing, deadly epidemic of prescription opioid overdose deaths. The lessons learned from clinical practice have influenced neurostimulator lead design, placement, and programming. There are several practical barriers in developing countries which have to be overcome to expand the application of these therapies in deserving patients.
REFERENCES


• Konstantin V Slavin, MD, FAANS. Peripheral Nerve Stimulation for Neuropathic Pain, US NEUROLOGY:TOUCH BRIEFINGS 2011


CAM therapies of late have been widely used in management of pain. The prevalence of CAM use in chronic pain is more than general population and is around 84%. While Mind body therapies help in sensory modulation of pain nutraceuticals and phytonutrients have anti-inflammatory effects. CAM uses a plethora of therapies that can be categorized broadly into plant based medicines, Energy medicine, Mind body medicine and Biofeedback. Evidence from several metaanalysis and RCTs have shown level 1 evidence for acupuncture in management of low back pain and chronic pain syndromes. The effects of these interventions are varied and mixed depending on the types of pains. The effects are maximum for myofascial and functional pain syndromes and least for neuropathy and organic pains. The type of intervention used depends on the causative and exacerbation factors as well. Several other interventions such a yoga, mindfulness meditation, tai chi, acupressure, chiropractice, chinese medicine and biofeedback have shown promising and beneficial effects. Pain modulation occurs by several different ways depending on the nature of pain and intervention. For example in patients with nociceptive pain , mere strengthening and stretching facilitates relief through endorphin release and stretch receptor activation. For neuropathic pain the inhibitory pain fibres from the frontal and pre frontal cortex play a vital role in modulation and likewise for inflammatory increased oxygenation of tissues and anti-inflammatory agents help modulate inflammatory pains. Research in CAM use has increased over the last decade we are seeing it being capsuled through the rich evidence as Integrative medicine. Bravewell collaborative is a network of Integrative medicine practitioners that facilitates to use Integrative medicine in USA and Canada. Pain patients use a number of therapies. Multiple modalities are often used by one practitioner, reflecting the reality of pain management, in which multiple therapies and multidisciplinary collaboration are needed and encouraged transitioning CAM into Integrative medicine.
The overall goal for patient selection is to choose those patients most likely to experience therapeutic success while reducing the possibility of risks, complications and adverse events. A careful assessment and discussion of the patient’s expectations and goals will help identify appropriate candidates for the therapy.

**KEY TASKS**

The key tasks involved with patient selection are:
- Review patient selection criteria.
- Qualify the patient.
- Facilitate patient education.
- Conduct the trial.

**Review patient selection criteria:**
This entails a complete evaluation of the pain and the patient’s medications. Patient selection for cancer pain (i.e., pain due to cancer or its therapies) is usually guided by the severity of the pain, the nature of the pain, life expectancy, and the location of the pain.
- Patient experiences inadequate pain relief and/or intolerable side effects from systemic opioid therapy.
- Patient’s life expectancy is greater than 3 months.
- Patient’s body size is sufficient enough to accept the bulk and weight of the pump.
- Patient has no evidence of infection.
- Patient has favorable response to a trial.

**Qualify the patient:**
When assessing a patient with nonmalignant pain for Intrathecal drug delivery, there are four primary areas on which to focus:
1. Pain assessment
2. Functional assessment
3. Psychological assessment
4. Medical and radiographic assessment

**Facilitate patient education:**
A critical component of patient selection involves thorough education of the patient and the patient’s family/support structure.

**Conduct the trial:**
The objective of the trial is to determine the patient’s response to the therapy. A trial can be performed:
- Using a Local anaesthetic
- Using epidural or intrathecal administration
- Single bolus injection, multiple bolus injections, or continuous infusion
With or without an intraspinal catheter

**Relevant Preparation:**

**KEY TASKS**

- Indications
- Consent
- Preprocedural orders/advise
- Equipment
- Drugs
- Resuscitation trolley

Other than preparation, the other important aspect is to look for the indication of the procedure. Interventional modalities for pain management should only be offered after an adequate trial of the pharmacology, wherein they are not able to provide adequate analgesia or causing serious unbearable side effects.

Then comes the written informed consent in the language the patient understands the best. Consenting should be a process and not a onetime phenomenon.

**References:**

2. Follett KA, Doleys DM. Minneapolis, MN; Selection of Candidates for Intrathecal Drug Administration to Treat Chronic Pain: Considerations in Pre-Implantation Trials. Medtronic, Inc: 2002.
The clinical assessment of pain source can be a challenge because of the complex anatomy and function of the spine. The advanced imaging methods are often not sufficient for a definitive diagnosis: a clinical correlation is always mandatory. Approach to spinal pain includes an appropriate history, examination, and medical decision making in the management of low back pain, neck pain and thoracic pain.

Based on the literature, in patients without disc herniation, lumbar facet joints account for 30% of the cases of chronic low back pain, sacroiliac joints account for less than 10% of these cases, and discogenic pain accounts for 25% of the patients while cervical facet joints account for 40% to 50% of cases of chronic neck pain without disc herniation, while discogenic pain accounts for approximately 20% of the patients.

There are algorithms to provide diagnostic and therapeutic approaches to clinical management of cervical, lumbar, and thoracic spinal pain.

**Low Back Pain**
Axial vs Radicular Back Pain

![Diagram showing different types of back pain]

<table>
<thead>
<tr>
<th>Table 1. Features of somatic and radicular pain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Somatic or Referred Pain</strong></td>
</tr>
<tr>
<td><strong>Causes</strong></td>
</tr>
<tr>
<td>Facet joint pain</td>
</tr>
<tr>
<td>Sacroiliac joint pain</td>
</tr>
<tr>
<td>Myofascial syndrome</td>
</tr>
<tr>
<td>Internal disc disruption</td>
</tr>
<tr>
<td><strong>Symptoms</strong></td>
</tr>
<tr>
<td><strong>Quality</strong></td>
</tr>
<tr>
<td>Poorly localized</td>
</tr>
<tr>
<td>Back worse than leg</td>
</tr>
<tr>
<td>No paresthesia</td>
</tr>
<tr>
<td>Covers a wide area</td>
</tr>
<tr>
<td>No radicular or shooting pain</td>
</tr>
<tr>
<td><strong>Modification</strong></td>
</tr>
<tr>
<td>Worse with extension</td>
</tr>
<tr>
<td>Better with flexion</td>
</tr>
<tr>
<td>No radicular pattern</td>
</tr>
<tr>
<td>Radiation</td>
</tr>
<tr>
<td>Low back to hip, thigh, groin</td>
</tr>
<tr>
<td>Radiation below knee unusual</td>
</tr>
<tr>
<td>No radicular pattern</td>
</tr>
<tr>
<td><strong>Signs</strong></td>
</tr>
<tr>
<td>Sensory alteration</td>
</tr>
<tr>
<td>Uncommon</td>
</tr>
<tr>
<td>Only subjective weakness</td>
</tr>
<tr>
<td>Atrophy rare</td>
</tr>
<tr>
<td>Reflex changes</td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Only low back pain</td>
</tr>
<tr>
<td>No root tension signs</td>
</tr>
</tbody>
</table>
### Table 1. Features of somatic and radicular pain

<table>
<thead>
<tr>
<th>Causes</th>
<th>Somatic or Referred Pain</th>
<th>Radicular pain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Facet joint pain</td>
<td>• Disc herniation</td>
</tr>
<tr>
<td></td>
<td>• Sacroiliac joint pain</td>
<td>• Annular tear</td>
</tr>
<tr>
<td></td>
<td>• Myofascial syndrome</td>
<td>• Spinal stenosis</td>
</tr>
<tr>
<td></td>
<td>• Internal disc disruption</td>
<td></td>
</tr>
<tr>
<td>Symptoms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>• Deep aching</td>
<td>• Sharp, shooting</td>
</tr>
<tr>
<td></td>
<td>• Poorly localized</td>
<td>• Well localized</td>
</tr>
<tr>
<td></td>
<td>• Back worse than leg</td>
<td>• Leg worse than back</td>
</tr>
<tr>
<td></td>
<td>• No paresthesia</td>
<td>• Paresthesia present</td>
</tr>
<tr>
<td></td>
<td>• Covers a wide area</td>
<td>• Well-defined area</td>
</tr>
<tr>
<td></td>
<td>• No radicular or shooting pain</td>
<td>• Radicular distribution</td>
</tr>
<tr>
<td>Modification</td>
<td>• Worse with extension</td>
<td>• Worse with flexion</td>
</tr>
<tr>
<td></td>
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<td>• No radicular pattern</td>
<td>• Radicular pattern</td>
</tr>
<tr>
<td>Radiation</td>
<td>• Low back to hip, thigh, groin</td>
<td>• Follows nerve root distribution</td>
</tr>
<tr>
<td></td>
<td>• Radiation below knee unusual</td>
<td>• Radiation below knee common</td>
</tr>
<tr>
<td></td>
<td>• No radicular pattern</td>
<td>• Radicular and shooting pain</td>
</tr>
<tr>
<td>Signs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensory alteration</td>
<td>• Uncommon</td>
<td>• Probable</td>
</tr>
<tr>
<td>Motor changes</td>
<td>• Only subjective weakness</td>
<td>• Objective weakness</td>
</tr>
<tr>
<td></td>
<td>• Atrophy rare</td>
<td>• Atrophy possibly present</td>
</tr>
<tr>
<td>Reflex changes</td>
<td>• None</td>
<td>• Commonly described but seen occasionally</td>
</tr>
<tr>
<td>Straight leg raises</td>
<td>• Only low back pain</td>
<td>• Reproduction of leg pain</td>
</tr>
<tr>
<td></td>
<td>• No root tension signs</td>
<td>• Positive root tension signs</td>
</tr>
</tbody>
</table>

**Fig. 3. A suggested algorithm for therapeutic interventional techniques in the management of chronic low back pain.**

* Not based on evidence
APPRAOCH TO PATIENTS WITH CHRONIC BACK PAIN
Algorithmic Approach to Back Pain Treatment
Neck Pain

Axial vs Radicular Neck Pain Pattern
Fig. 5. A suggested algorithm for therapeutic interventional techniques in the management of chronic neck pain.

* Not based on evidence
# Transforaminal epidural injections have been associated with reports of serious risks and adverse events
APPRAOCH TO CHRONIC NECK PAIN
**APPRAOCH TO CHRONIC THORACIC PAIN**

**Chronic Thoracic Pain**

Based on Clinical Evaluation

- **Facet Joint Blocks**
  - Positive
  - Negative
  - **Epidural Injections**
    - Positive
    - Negative
    - Stop Process

- **Epidural Injections**
  - Positive
  - Negative
  - **Facet Joint Blocks**
    - Positive
    - Negative
    - Stop Process

---

**Fig. 7. A suggested algorithm for therapeutic interventional techniques in the management of chronic thoracic pain.**

*Not based on evidence*
Fig. 7. A suggested algorithm for therapeutic interventional techniques in the management of chronic thoracic pain. * Not based on evidence.
Low back pain (LBP) is a very common problem. There are many pain generators in spine which are potential sources of pain. One of the common pain generator in lumbar spine is muscle. They are often under diagnosed and untreated. Myofascial pain syndrome (MPS) is the term often used for pain originating from spine. MPS was first conceptualized by Janet Travell in the 1950s as the presence of trigger points (TP). Subsequently, they were credited with identifying psoas and quadratus lumborum as possible cause of MPS in back.

Psoas major (PM) muscle originates from T12 vertebra and along the lateral border of all lumbar vertebrae and finally it attaches to the lesser trochanter of the femur. The PM muscle is active while sitting, standing, and maintaining posture. Flexion of the hip at the thigh is another major function of PM along with iliacus muscle. Pain from PM muscle is often referred from ipsilateral lower thoracic spine to sacroiliac area. Occasionally, this pain extends to upper buttock. Patients typically point their hand vertically up and down when they have pain from PM TPs. Patients often describe worse pain while getting up from sitting position.

Physical examination can often provide some clue in diagnosing PM MPS. Patients often complain increased pain with active straight-leg raise (SLR), which is decreased with passive SLR. Extension of leg at the hip in lateral decubitus often increases pain. Sometimes, tenderness can be elicited at the insertion site of PMM over lesser trochanter.

Another important muscle which is quite important and causes MPS in back is quadratus lumborum (QL). QL muscle attaches to 12th rib, ilium, and transverse processes of upper four lumbar vertebrae. QL functions as lateral flexor and stabilizer of lumbar spine. Symptoms of QL myofascial pain include LBP with weight-bearing posture, and discomfort during turning over in bed. Sometimes, simple coughing and sneezing can exacerbate back pain. The QL MPS can get referred to upper and lateral buttock and even lateral lumbar region. Physical examination shows muscular guarding and truncal rigidity with rolling over or rising into an upright position. Usually there exists both superficial and deep TPs in QL MPS. Pressing over these TPs can elicit the pain and helps in injecting at these locations.

Chronic pelvic pain (CPP) from pelvic floor muscle spasm or even gluteal muscles is quite well-known. Piriformis syndrome or spasm occurs in 5-8% of the patients leading to gluteal pain and sciatica like symptom. Other common muscles are obturator internus, and pelvic floor muscles like levator ani and coccygeus.

The management of these MPS typically involves medication, physiotherapy and interventions like TP injection of local anesthetic or botulinum toxin. There are four group of medication which are usually helpful, and they include NSAIDs, muscle relaxants, antidepressants, and anticonvulsants. Physiotherapy like manipulation, message, and strengthening exercise is quite helpful. In resistant cases, TP injections usually helps in diagnostic as well as therapeutic treatment of MPS.

Interventional treatment like TP injection especially PM, QL, piriformis and obturator internus muscle are often done under image guidance as these are deep muscles. In the beginning, they were done under fluoroscopy guidance, but, increasingly they are being done under Ultrasound guidance as it helps in real-time needling and avoids radiation exposure. Usually, the injection is done at L3-4 level and dye is used to confirm ideal needle tip placement when done under fluoroscopy. Lateral imaging is a must to ascertain the needle tip and appropriate dye spread. Then, usually 8-10 ml solution containing a mixture of local anesthetic-steroid is injected inside the muscle. In case of botulinum toxin, the lowest effective dose like 25-50 Unit is usually injected into the muscle. Potential complications include infection, bleeding, hematoma, possible nerve root injury if due attention is not given.
The knee joint is the largest and complex joint because of the fusion of three joints, i.e., medial and lateral femorotibial and femoropatellar joint. It is a Synovial hinge joint with various articular surfaces and ligaments. Nerve supply to knee joint is via Femoral, Sciatic and Obturator nerves.

General Approach to the Patient with Knee Pain and clues from the history:

4) **Rule out Red flags**
   
   d) An acutely effused knee with history of trauma: fracture must be ruled out
   
   e) A red, hot knee joint, consideration must be given to septic arthritis.
   
   f) Patients with systemic symptoms or multi joint involvement. These patients are likely to have a systemic condition and should be appropriately evaluated

5) **History of knee pain**

   A thorough history plays a very important in determining the etiology of knee pathology.
   
   c) Main symptoms – Pain / Swelling
   
   d) Mechanical – Gelling /Locking/Pseudolocking /Popping –/Buckling /Crepitation

6) **Examination**

   Examination Evaluation of knee requires complete exposure of the involved knee as well as the other knee for comparison.
   
   • Inspection
   
   • Palpation
   
   • Range of motion
   
   • Special maneuvers/Tests

   General Observation: posture and movement patterns has to be noted

   Inspection:
   
   d) Effusion
   
   e) Poor Alignment
   
   f) Muscle Wasting

   Palpation:
   
   h) MCL (medial collateral ligament)
   
   i) LCL (lateral collateral ligament)
   
   j) Joint Line
   
   k) Patella
   
   l) Patellar Tendon
   
   m) Hamstrings Tendons
   
   n) Popliteus.

   Range of Motion:

   e) AROM, PROM, and Overpressure
   
   f) Muscle Strength and length
   
   g) Clear hip and ankle with full AROM + overpressure
   
   h) If lumbar spine suspected add passive intervertebral mobilisations (PA spinous processes, PA transverse processes)
Neurological Examination : Dermatome examination - L1 to S4

Myotome examination –

h) L2  Hip Flexion
i) L3  Knee Extension
j) L4  Dorsiflexion
k) L5  Big Toe Extension OR 4 Lesser Toes Extension
l) L5/S1 Knee Flexion
m) S1  Plantarflexion OR Foot Eversion
n) S2  Toe Flexion

Reflexes:               a) Patella Ligament (L3/L4)
b) Achilles Tendon (S1/S2)

Special tests :

ACL -

5. Lachman’s Test
   It is the most sensitive test to detect ACL injury. Patient lies supine on the bed. Place the patient’s knee 20-30 degrees flexion. The leg should also be slightly externally rotated. The examiner should place one hand on tibia and the other hand on thigh. Place the thumb on tibial tuberosity. Now on pulling the tibia anteriorly an intact ACL would prevent anterior translation of tibia on femur.

6. Anterior drawer
   The patient lies supine with hip flexed at 45 degrees and knee flexed at 90 degrees. The examiner sits on the toes of patient to stabilize the leg. Then the examiner grasps the proximal lower leg just below the tibiofemoral joint line and attempts to translate the lower leg anteriorly. The test is considered positive if there is a lack of end feel or excessive anterior translation relative to the contralateral side.

7. Pivot-Shift
   The patient lies supine with the leg relaxed. The examiner grasps the heel of the involved leg with examiner’s opposite hand placed laterally on the proximal tibia. The examiner then applies valgus stress and axial load while internally rotating the tibia as the knee is moved into flexion from the fully extended position. A positive test is indicated by subluxation of the tibia while the femur rotates externally followed by a reduction of the tibia at 30-40 degree of flexion.

PCL

2. Sag sign
   Patient lies supine. Patient’s involved leg is placed with hip 45 degrees flexion and knee 90 degrees flexed. Look for tibia to ‘sag’ compared to the position of femur.
2. Posterior Drawer
The patient is supine and the knee to be examined is placed 90 degrees flexion. The examiner sits on toes to stabilize it. The examiner grasps the tibia approximately at joint line and attempt to translate it posteriorly. The test is positive if there is a lack of end feel or posterior translation.

MCL/LCL Valgus stress test and varus stress test
The patient lies supine. The leg hangs off the table. Knee is stabilised on examiner’s knee. Knee is flexed at 30 degrees to isolate the collateral ligament from the stabilizing force of PCL.
Fix the thigh with one hand. Give varus stress (medial collateral) and valgus stress (lateral collateral). Test is considered positive if there is ligamentous laxity or pain in giving valgus or varus stress.

Meniscus
2. McMurrays
The patient lies supine. Both hip and knee flexed at 45 degrees. One hand grasps the ankle and other hand grasps the knee such that it lies on the joint line above the meniscus. To test medial meniscus valgus stress to flexed knee is applied. Ankle is externally rotated. Knee is extended slowly maintaining valgus stress to it. Lateral meniscus is assessed in the same way with varus stress and internal rotation of ankle.
Pain on medial/lateral joint line palpation is elicited in meniscal injury.
2. Joint line tenderness

3. Apley’s Test
Place the patient in prone position with knee flexed at 90 degrees. The patient’s thigh is then rooted to the examining table with the examiner’s knee. The examiner rotates tibia laterally and medially, combined first with distraction while noting any excessive movement, restriction or discomfort. The process is then repeated using compression instead of distraction.

ROTATION+DISTRACTION PAINFUL = LIGAMENTOUS INJURY
ROTATION+COMPRESSION PAINFUL = MENISCAL INJURY
8. Steinman Test
This maneuver is essentially passive ROM with the examiner palpating joint line. Patient lies supine with knee and hip flexed 90 degrees. Examiner palpates around knee joint line and does flexion and extension of knee while palpating joint line. Pain with movement and crepitus = meniscal lesion.

Patellofemoral

- Grind Test (Clarke's sign)
Patella grasped between thumb and forefinger, patella is moved up into the trochlear groove against contracted quadriceps. Crepitus may be felt if present.

References

Dr. Sameer Desai

Topic - Moving towards Pain Management from Pain Treatment.

Despite extensive research over centuries, understanding of pain mechanisms is still far from optimal. We have moved from periods of attributing pain to godly punishment for disbelievers to dualism period which shifted the centre of pain from the heart to the brain and defined pain as sensation. Historically pain was viewed as purely sensory mechanism, reflecting the degree of incoming sensory noxious stimulus. Primary belief in sensory model is that amount of pain experienced is direct result of amount, degree and nature of sensory input caused by physical damage. Therefore treatment of physical damage should reverse the pain sensation completely. But there are number of paradoxes in clinical practice: patients having severe pain may have limited pathology, individual with significant pathology may not report any pain, identical treatment provided for same diagnosis may give totally different responses. Many chronic pain sufferers underlying cause of pain remains elusive. How to explain these paradoxes?

Work by Melzack, Wall and Casey on the “Gate control theory of pain” stimulated much interest in the multidimensional and subjective aspects of pain. Fordyce encouraged the importance of social and environmental factors that influence both verbal motoric expression of pain. Psychological and social factors are now recognised far more important in definition of pain than just “unpleasant sensation”. To accommodate this concept ISSP redefined pain in 1979 emphasising the emotional aspect of pain.

The focus of treatment on pain by pharmacotherapy, interventional management, and surgical methods are traditionally considered as Pain treatment. Even though these pain treatment yield reproducible results in many cases, they do not provide full satisfactory results in all the patients. Hence focus of treating the psychological and social aspect related to pain by various physical therapy, psychotherapy and relaxation methods gained prominence in the multimodal management of pain, which lead to development of concept “Pain Management” rather than “Pain Treatment”. Certain branches of the chronic pain conditions like cancer pain treatment and palliative care have particularly realised the importance of not just treating the pain but controlling the other symptoms and managing social, psychological, spiritual aspects is very essential for overall patient satisfaction and they aim for Pain Management rather than just Pain treatment.

Origin of pain may not be psychological, but how patient responds to it is. When pain is chronic, learning history and operant conditioning sometimes contribute to the persistence of pain and disability, and counterproductive beliefs may impede a positive response to medical intervention. Therefore, psychological methods should be an integral part of the interdisciplinary approach to the management of chronic pain. Overall high incidence of psychological problems in chronic pain patients and significant
success that the psychotherapy methods can provide, makes it imperative that every person practicing the pain medicine should have basic understanding of these techniques. Different condition respond well to different psychotherapy modalities, the basic understanding of which will help in making best use of different modalities available and referring the patient to the most suited therapist. The “stigma” associated with the “psychiatrists, psychotherapists” may lead patient’s refusal to see these specialists. Therefore it is all the more important that the treating pain physician should have basic knowledge of these psychotherapy methods and implement them in practice and refer the difficult to manage cases to the specialists. One reason that medical interventions sometimes fail or minimally succeed is poor patient adherence to treatment regimens. Estimates of the prevalence of medication non-adherence for the population as a whole are relatively high (30% to 60%). Psychological interventions may help assess and enhance patient adherence with treatment (e.g., medications, physical therapy), thus increasing the probability of successful management.

The overall goal of these psychological interventions is to reduce pain, treat the co morbid mood disturbances like anxiety, depression, increase the perception of self-control over the pain, reduce the pain related disability and reduce the impact of patient’s pain on family and marital functioning.

A number of physical and psychological interventions have been empirically demonstrated to reduce the pain and suffering in patients with wide variety of chronic pain conditions and are essential first line management in patients with chronic non cancer pain. In addition to relieving pain, such methods can reduce fear and anxiety, improve physical function, and alter physiological responses to pain. Treatments used in physical rehabilitation include stretching, exercises/reconditioning (to improve strength, endurance, and flexibility), gait and posture training, and attention to ergonomics and body mechanics. Other noninvasive physical treatments for pain include thermotherapy (application of heat), cryotherapy (application of cold), counter-irritation, and electroanalgesia (e.g., transcutaneous electrical stimulation). In some cases, patients choose to pursue non-allopathic (alternative treatments) such as acupuncture or therapeutic massage, yoga, all of which have shown benefits in the scientific literature as well.

### Table1. Physical Therapy interventions helpful in Pain Management.

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Definition</th>
<th>Purpose/Goals</th>
<th>Examples of Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stretching</td>
<td>Gentle exercise to improve flexibility</td>
<td>Improve ROM, function, comfort</td>
<td>Arthritis, fibromyalgia, LBP, pain</td>
</tr>
<tr>
<td>Exercise/reconditioning</td>
<td>can improve strength and endurance as well as combat stiffness and weakness associated with pain-related</td>
<td>regaining muscle strength, as well as improving ROM, endurance, comfort, and function</td>
<td>Arthritis, LBP, fibromyalgia, CRPS</td>
</tr>
<tr>
<td>Gait and posture training</td>
<td>Appropriate attention to gait and posture, including preventive and therapeutic ergonomics</td>
<td>Relieve pain and restore function; prophylaxis against further pain</td>
<td>LBP, neck pain, tension Headache</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>Applied heat or cold</td>
<td>Application of cold (cryo-therapy) to decrease pain and swelling and improve function; later application of heat (thermoterapy) to augment performance and diminish pain</td>
<td>Application of cold produces local analgesia, slows nerve conduction, and promotes tendon flexibility. Application of heat produces local analgesia, dilates (widens) blood vessels, and promotes flexibility</td>
<td>Acute trauma (e.g., injury, surgery); repetitive trauma, arthritis, muscle pain or spasm, acute LBP</td>
</tr>
<tr>
<td>TENS</td>
<td>Selective stimulation of cutaneous receptors sensitive to mechanical stimuli (mechanoreceptors) by applying low-intensity current via skin electrodes</td>
<td>TENS can reduce pain and analgesic use and improve physical mobility, presumably by interfering with transmission of nociceptive impulses in nerve fibres</td>
<td>Trauma, postoperative, labor, abdominal pain; neuralgias, other neuropathic pain, PVD, angina, musculoskeletal pain</td>
</tr>
<tr>
<td>Massage</td>
<td>Rubbing of painful or non-painful adjacent area</td>
<td>Facilitates relaxation and decreases muscle tension and pain</td>
<td>Fibromyalgia, myofascial pain syndrome</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>Old Chinese healing technique involves insertion of fine needles into the skin at varying depths; application of pressure at acupuncture sites is called acupressure</td>
<td>Acupuncture may cause the secretion of endorphins and interfere with transmission of nociceptive information to relieve pain</td>
<td>Postoperative, radiculopathy, chronic LBP, fibromyalgia</td>
</tr>
</tbody>
</table>

Psychotherapy treatments can be broadly identified as behavioural and cognitive and they are integral part of multidisciplinary treatment

**Table 2. Psychological Methods helpful in Pain Management.**

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Definition</th>
<th>Purpose/Goals</th>
<th>Examples of Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient education</td>
<td>Provision of detailed information about disease or interventions and methods of assessing and managing pain (e.g., preoperative instruction about importance of deep breathing, coughing, and ambulating postoperatively; teaching patients with chronic pain about what may aggravate and</td>
<td>Can reduce pain, analgesic use, and length of hospital stay</td>
<td>Postoperative pain, chronic pain</td>
</tr>
<tr>
<td>Biofeedback</td>
<td>directed at teaching a patient how to take control of body responses via mental activity</td>
<td>Most support for use with vascular HA; also used for chronic LBP and other HA, myofascial pain, rectal pain</td>
<td></td>
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<td>-----------------------------</td>
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<td>--------------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Patient learns to take voluntary control over physiological body activities by receiving input (e.g., visual or auditory cues) about these activities (e.g., heart beat, muscle tension, skin temperature)</td>
<td></td>
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</tr>
<tr>
<td>Relaxation with imagery</td>
<td>Relaxation decreases patient’s focus on pain, muscle tension, and autonomic and emotional arousal; imagery provides a competing cognitive focus, which can block the perception of pain</td>
<td>Postoperative pain, chronic headache, chronic LBP, cancer pain, arthritis pain, labor pain, Tempro mandibular dysfunction</td>
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<tr>
<td>includes progressive muscle relaxation, imagery, visualization, and meditation</td>
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<tr>
<td>Operant interventions</td>
<td>Refers to methods not for treating the pain per se but rather helping patients to change behaviors</td>
<td>Chronic pain</td>
<td></td>
</tr>
<tr>
<td>manipulation of environmental consequences of pain behavior in a way that helps patients to modify their behavior; it involves use of social reinforcers to increase “well behavior” (e.g., exercise, non-medical conversation) and decrease “sick role” behavior</td>
<td></td>
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</tr>
<tr>
<td>Cognitive Behavioural Therapy</td>
<td>Helps patients alter their perceptions or labeling of pain (i.e., decrease negative thoughts, emotions, and beliefs), increase sense of control, and decrease</td>
<td>Chronic pain</td>
<td></td>
</tr>
<tr>
<td>CBT combines cognitive therapy techniques (e.g., attention diversion) with behavioral techniques (e.g., relaxation, assertiveness training); there are two major CBT subtypes: cognitive restructuring and coping skills training</td>
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</tbody>
</table>
Non-pharmacologic strategies should supplement, but not replace, the use of medications. In addition to supplementing the pain-relieving effects of analgesics, non-pharmacologic approaches offer other advantages, like improve mood, reduce anxiety, increase a patient’s sense of control, strengthen coping abilities, assist with sleep, relax muscles, and improve quality of life. Factors that influence the choice of a non-pharmacologic approach to pain management include the pain type, duration, and severity; the patient’s preferences, coping skills, and capabilities; the availability of support (e.g., family members); the availability of care within the community; and cost.

Unfortunately, psychological approaches to pain management are not used as often as they should be, due to a variety of reasons (e.g., lack of awareness of the role of psychological factors in the response and adaptation to pain, time constraints, and reimbursement policies). Better awareness and incorporation of these methods by the pain physicians can bring about significant difference in the pain outcome and patient satisfaction.
The prescription opioid epidemic is well known now, especially in the USA. Ever since the late 1990s, opioid prescriptions had gone up tremendously in the USA and Canada, particularly for chronic non-cancer pain like low-back and joint pains, and for relatively simple acute procedures like dental extraction and minor surgical operations. There were several reasons behind this phenomenon, including a dedicated group of pain physicians genuinely interested in their patients’ welfare, overcoming the culture of ‘opiophobia’ prevalent those days, and in establishing pain as the ‘fifth vital sign’ and pain relief by any means as a ‘fundamental human right’. However, certain pharmaceutical companies capitalized upon this emerging change of attitude and pushed their high-potency opioid formulations like oxycodone and hydrocodone, touting these as less addictive and suitable for any kind of pain including non-cancer pain. The federal and physician-level monitoring of opioid prescriptions and use patterns were also very lax in the beginning. It has been estimated that there is enough opioid prescriptions for each and every person in the USA to have opioids for one month! A combination of these and other factors led to the infamous prescription opioid epidemic in the USA, characterized by massive use, misuse and diversion of high-potency opioids and overdose deaths due to this. The toll is still continuing. This has led to a panic, alarm, and a second wave of opiophobia worldwide.

However, the story in India and other third-world countries (like many African countries) is a diametrically opposite one. It is a matter of great irony and misfortune that India, while being by far the largest producer of licit opium for medicinal purposes, exports maximum to the developed countries like USA, Canada and Australia, and very little is left for consumption by genuinely needy patients like those suffering from metastatic cancer pain and those in palliative care. Also, very high-potency drugs like oxycodone and hydrocodone are not available in India as yet, though the latest amendment of Narcotic Drugs and Psychotropic Substances (NDPS) Act has listed these as Essential Narcotic Drugs. The stark reality is that opioids are still grossly unavailable for patients in India; even the availability of a WHO-listed essential drug like morphine, which is cheap and effective, is severely restricted. There can be no question of an “epidemic” if the causal agent is not available. As of now, the data from pain clinics and physician experience do not suggest any significant opioid addiction or overdose by patients. The data from opioid dependence surveys conducted in India also show that heroin and other illicit opioids are primarily the addictive drugs used in India, and pharmaceutical opioids, when abused, are not primarily from prescription source but used as substitutes for illicit opioids, obtained from non-prescription sources.
We have to appreciate that in India, as opposed to the north America, (a) our pain patients’ profiles are very different (opioids on a long-term basis are prescribed only to palliative care and cancer patients, and for short-term use in some postoperative patients following major surgeries, not to the vast majority of chronic non-cancer patients; (b) our prescribed opioids are very different (mostly morphine, and fentanyl for very selected patients, unlike oxycodone and hydrocodone); and (c) the amounts of opioids prescribed are very different (miniscule compared to what is prescribed in the USA, Canada and Australia, for example). Thus, the context of opioid use is very different here. Of course, it is well known that any opioid is potentially addictive and covered under NDPS Act. Hence one needs to exercise caution and monitor appropriately with checks and balances in the system. But that does not mean that patients who genuinely and desperately need opioids should be deprived of this.

In its February 2018 position statement on opioids, the International Association for the Study of Pain (IASP), while exercising great caution in the use of opioids for chronic non-cancer pain, emphasizes that “Opioids are indispensable for the treatment of severe short-lived pain during acute painful events and at the end of life (e.g., pain associated with cancer). Currently, no other oral medication offers immediate and effective relief of severe pain. Although opioids can be highly addictive, opioid addiction rarely emerges when opioids are used for short-term treatment of pain, except among a few highly susceptible individuals. For these reasons, IASP supports the use and availability of opioids at all ages for the relief of severe pain during short-lived painful events and at the end of life. IASP’s 2010 Declaration of Montreal states that access to pain management is a fundamental human right. In some cases, there is no substitute for opioids in achieving satisfactory pain relief.”

In summary, the context of the prescription opioid epidemic elsewhere in the developed countries is not at all generalizable and applicable in the Indian context at present.
Topic - Pain education for medical undergraduates Challenges & Opportunities.

Dr. Umamaheshwara Rao W

Current Status of Pain Education & Implementation Challenges:

1. Education in pain management continues to be a low priority in health professional curriculum despite decades of research documenting unmet global needs.

2. The 2016 Global Burden of Disease Study shows that persistent pain is a major and increasing cause of morbidity and disability worldwide.

Health Care Spending in United States:
- The most expensive condition, DM, totalled $101 billion in diagnoses & treatments, growing 36 times faster than the cost of IHD
- DM & IHD typically affect individuals 65 & older
- Low back & neck pain, the third-most expensive condition, primarily strikes adults of working age.

Challenges to provide effective pain management?

1. Deficiencies in provider education and training
2. Inadequate resources - Staffing, equipment & Finances
3. Lack of opioid analgesics
4. Misalignment of government policies and priorities
5. Failure of public health advocacy and patient education.

Briggs EV et al conducted a study where a sample of 74 health sciences programs including medicine, dentistry, midwifery, nursing, occupational therapy, pharmacy, physiotherapy, and veterinary medicine across 19 institutions in the UK found that programs had an average of 12 hours of pain content, with the greatest amount of content found in veterinary medicine and Physiotherapy.

What solutions are Practical?
Common recommendations that have emerged from studies on undergraduate pain education.

**Effective Training Programs**
- Provision of pain teaching
- Hours spent teaching pain
- Pain topics

**Education in coordinated pharmacological and non-pharmacological treatments**
- Pain assessment
- Therapies for pain management

**Education in access to reliable drug supplies**
- Medication access and availability
- Regulation of controlled medications
- Supply and distribution

---

**Take Home Message:**
- A roster of health professionals with pain education to act as mentors for trainees.
- Improving the pain curriculum in medical schools should be prioritized both in Undergraduates & Postgraduates.
- Continuing medical education (CME's) are essential in developing and maintaining best practices.

---

**Pain education: future directions**

- Increasing the curriculum time devoted to Pain assessment & management
- Incorporating an inter-professional approach to undergraduate medical teaching
- Learners should be comfortable with opioid prescribing practices
- Should be competent in prescribing non-opioid and non-pharmacologic pain management options
Topic - WHAT’S IN THE BLOOD
Dr. Venkatesh Nevagi

Many chronic pain syndromes can be diagnosed by good clinical examination with the help of radiological studies and blood investigations.

Blood investigations are important in few of the chronic pain syndromes not only in diagnosis but also as prognostigating tools.

Important chronic problems in pain which need blood tests to reach close to diagnosis are as follows:

- Spine conditions like ANKYLOSING SPONDYLOSIS, infective spine disease
- ARTHRITIS
- Abdominal pain
- Pelvic pain
- Cancer pain

Most common blood tests done during diagnosis stage of chronic pain syndromes are as follows:

- COMPLETE HEMOGRAM
- ESR
- CRP
- HLA B 27
- SERUM CALCIUM LEVELS
- SERUM VITAMIN B12
- LFTs
- RFTs
- URIC ACID
- ANTI CCP (ANTICYCLIC CITRULINATED PEPTIDE) ANTIBODIES
- INTRA-ARTICULAR FLUID EXAMINATION
Intervertebral disc consists of collagenous exterior annular fibers and gelatinous interior nucleus pulposus. The annular fiber is thicker anteriorly and hence herniations and tears are more common posteriorly. Nerve supply to disc is from sinovertebral nerve and grey rami communicantes. These nerves are segmental and form the dorsal ramus, but recent studies have shown some contribution from sympathetic chain in a non segmental distribution. Pain from disc can occur from 3 main causes i.e. Disc infection, torsion injury and intervertebral disc disruption (IDD), according to Dr. Bogduck. Torsion injury is due to forcible rotation of intervertebral joint. Rotational forces around an impacted facet joint produces lateral shear forces in the disc, which can lead to circumferential tear.

IDD result from disc degradation, its nuclear components and development of radial fissures that extend from nucleus to annulus. Disk disruption is not same as disc degeneration. The development of radial fissures is related to repetitive shears and neural ingrowth are proposed mechanism of development of IDD. Pain associates pro inflammatory mediators have been isolated for discs of this morphones. Modified Dullas scale is a descriptive way of categorizing the severity of IDD. Genetics, smoking, nature of work, life-style- all have an influence on discogenic pain.
The world around us has been experiencing a rapid evolution in technology that has had a lasting impact on the way we interact and treat our patients. Modern technological advances can be overwhelming for practicing clinicians due to a lack of head to head, high quality and long term studies comparing the changes. In the area of chronic pain management, neuromodulation and spinal cord stimulation (SCS) are rapidly advancing to remedy the limitations of conventional SCS. Older SCS systems have limited indications with partial efficacy. They can be cumbersome, with intruding paresthesia and positional variability. When these are factored with the higher cost, complication rates of 30-40% and explant rate of 5-6%, this treatment modality is relegated as a last resort. New technologies and their applications are constantly emerging to provide holistic solutions to the problems above while allowing us to be efficient on a scale that has been eluding us to date. Newer Waveforms, adaptive stimulation, innovations in hardware and wearable technology are enabling us to push past our current constraints in providing the most effective treatment while allowing us to be efficient on a scale that has been eluding us to date.

Paresthesia Free Waveforms:
Major breakthroughs in neuromodulation are due to paresthesia free newer waveforms such as the Nevro High frequency(HF10) and St. Judes’ Burst systems. Similar to the proportionality of the dose to drug effect, charge delivered per second determines the effect of SCS systems. With manipulation of amplitude and pulse width charge is delivered is altered. In HF10, a series of 10,000 Hertz tonic impulse deliver a higher charge to the patient as opposed to the conventional tonic stimulation of 20-120 Hz. This possibly contributed to improved patient outcomes. But this 10kHz setting is an energy-demanding form of stimulation that demanded innovation in battery technology to avoid too frequent re-charging of the device.

Similarly the principle of the other successful paresthesia free waveform, De Ridders’ Burst stimulation was to mimic the natural neuronal action potential of a nerve axon. This delivers bursts of pulses at a high frequency and at amplitudes much lower than tonic stimulation. These groups of pulses are separated by a pulse-free period called an interburst interval during which passive re-polarisation occurs prior to the next burst. The additional pain reduction during burst stimulation was only marginally smaller compared with tonic stimulation. Other researchers experimented on High Density (HD) stimulation with a frequency of tonic stimuli ranging up to 5000 Hz while HF10 was establishing itself.
Hardware Innovation: 15-20% of SCS implanted patients encounter device related problems such as migration and fracture of electrodes leading to loss of paresthesia and analgesia. To reduce this improved surgical techniques such as shallow angle entry into the epidural space is used along with specially designed anchors to prevent kink on the electrode. Longer leads that connect directly to the implantable pulse generator reduced the requirement of connector and there by risk of lead corrosion.

Position-Adaptive Stimulation: Variability in stimulation with position is a practical issue for patient. AdaptiveStim™ uses a 3-axis accelerometer that automatically senses the patient’s body position and activity, while the software automatically adjusted stimulation amplitude for that position to a level pre-defined by the patient and the clinician. For device orientation patients were positioned six positions upright, lying back or lying front, lying left, and lying right. An algorithm links the data from the accelerometer to the selected positions selected.

MR conditional SCS systems: The Vectris percutaneous and surgical paddle leads developed by the Medtronic SCS SureScan MRI System has a braided body that act as a radio-frequency shield. RF energy, travels of the conductor wires, and dissipates to the body tissues along the entire length of the lead body and the IPG casing. Boston Scientific’s Avista MRI percutaneous lead has heat-cancelling technology called billabong current suppression. Here 3 layers of winding leads with short reversed coiled sections are effectively used in suppressing induced currents. It is to be noted that MRI can be performed only with some devices in a specified MR environment under specified conditions of use that needs prior verification.

Wearable Technology: Stimwave is the latest revolution where, the Freedom Stimulator “implant” comes with both a “stimulator” and a “micro-receiver” that are covered with a protective casing. The stimulator has small metal electrodes near the tip that create an electrical field of energy when power is applied. The micro-receiver receives energy wirelessly from an externally worn transmitter (wearable antenna assembly (WAA)). This assembly eliminates the complexities of an implanted lithium ion battery. The technology has flexibility in delivery all the available wave forms over all frequency ranges. The control of these waves can be fine tuned by the patient via Iphone-Iwatch controllers using their Wavecrest mobile IOS platforms.

Newer Stimulation Targets: New research suggest that the Dorsal root ganglion(DRG) is actually responsible for the hyperexcitability of the central nervous system that leads to many of the neuropathic pain symptoms (i.e. allodynia and central sensitisisation). With DRG also being accessible paved way to DRG stimulation systems particularly for diseases live CRPS. Apart from dorsal columns and DRG further innovations in technology allowed newer stimulation targets such as peripheral nerves and peripheral field stimulation tried with good effect. Expanding indications for treating complex conditions such as peripheral vascular diseases, refractory anginas, epilepsy, obesity, vulvodynia are constantly explored.

Future: The impact of these new SCS therapies for people living with pain is tremendous. Rather than relying on outdated methods that managed pain unsustainably, physicians can now focus on individualising pain therapy. Accumulated evidence supporting neuromodulation and advanced technologies makes pain care robust and grounded while the quest for newer inventions and innovation for the betterment of patients should continue.
Adequate pain management is a compelling and universal requirement in health care. Despite considerable advancements, the adverse physiological and psychological implications of unmanaged pain remain substantially unresolved. Ineffective pain management can lead to a marked decrease in desirable clinical and psychological outcomes and patient’s overall quality of life. Use of interdisciplinary pain teams can lead to improvements in patient’s pain management, pain education, outcomes, and satisfaction. A Goal is something that you are motivated to work toward and achieve. When you are working on your pain management plan, it is important to set goals that can help to both motivate and also direct your efforts and energy.

Six steps to achieving your personal goals. They are -

1. Assess
2. Advise
3. Agree
4. Assist
5. Adapt

We should Consider for setting SMART goals. SMART goals are the most effective goals, and are most likely to help make your treatment plan a success.
- **Specific**—each goal must describe a specific action or step, like “walk around the block” instead of “take a walk.”
- **Measurable**—each goal must have a specific way to evaluate it so you know when it has been reached, like “walk around the block in 30 minutes.”
- **Attainable**—each goal must have your full and complete commitment behind it, like “walk to the next block when I have a pain-free day.”
- **Realistic**—each goal must be possible for you to achieve, given any restrictions or limitations you may have, like “today my pain is worse, so I will walk around the block in 45 minutes.”
- **Tangible**—each goal must have a reasonable target date for when you want or hope to achieve it, like “I want to walk five blocks in three months time.”

Below are some Goal categories we can think about while making list of goals.
- Physical goals
- Recreational goals
- Recovery goals
- Lifestyle goals
- Creative goals

Self-management relates to the tasks that an individual must undertake to live well with one or more chronic conditions. These tasks include gaining confidence to deal with medical management, role management and emotional management. It is the systematic provision of education and supportive interventions by health care staff to increase patient’s skills and confidence in managing their health problems, including regular assessment of progress and problems, goal setting, and problem-solving support. Self-management is about taking an active approach to dealing with pain.

**Why Self Management is useful?**

- Reduces disease symptoms
- Improves quality of life
- Helps people be more active and independent
- Provides a non pharmacological treatment tool
• Lets patients be active partners in their healing

Self-Management Techniques help to release endorphins, our body’s natural opioids. Endorphins are powerful chemicals to block pain and improve mood without the unpleasant side-effects of medications. These are -
• Breathing
• Body Awareness
• Exercise
• Repetitive Movement
• Meaningful Activity
• Positive Distraction
• Creative Activity
• Mindfulness
• Pacing and Planning
• Setting Goals

So, Goal setting & self management is the important part of pain management, rehabilitation. Role of Pain physician, psychotherapist & occupational therapist is vast for achieving successful Pain Free state!

References
Musculoskeletal ultrasound has seen significant use over the past 10 years. We now regard it as a front-line diagnostic tool to

1. evaluate tendons, ligaments and muscles around the ankle, knee, hip, hand, elbow and shoulder for acute injuries and other pathologies
2. guide therapeutic injections and aspirations of many joints, muscles, tendons and nerves.

Dynamic imaging is a very important aspect of musculoskeletal ultrasound. Sometimes, a patient’s symptoms are only reproduced with movement. Ultrasound can allow for real-time imaging while the patient reproduces his or her symptoms. This is not possible to the same degree with other imaging modalities. Musculoskeletal ultrasound is fast, low-cost and safe. It provides immediate visualization and allows for dynamic imaging. For many superficial musculoskeletal soft tissues, ultrasounds offer the most high-quality images available. An added feature of ultrasound is the ability to evaluate for active inflammation by detecting increased blood flow in soft tissues using Doppler imaging. Another benefit is the proximity of clinician and patient, which encourages their interaction.

Musculoskeletal ultrasound is very useful for procedures, allowing for real-time visualization of the needle and the target during the procedure. Ultrasound can be used for specialized injections into joints and soft tissues, as well as for aspiration of fluid from joints or soft tissues for testing. For therapeutic injections, it is crucial that the medication be placed in the correct location. Ultrasound ensures that this can happen.

Unlike CT and X-ray, musculoskeletal ultrasound does not expose patients to radiation. It costs less than MRI. Musculoskeletal ultrasound is also safe for those with metal implants or stimulators who are being examined or who are in the treatment area. It is quiet and more comfortable for claustrophobic patients and obese patients. It is important to note that musculoskeletal ultrasound cannot penetrate bone. Thus, problems involving the bones themselves and deep joint structures warrant X-ray and sometimes MRI or CT for further evaluation.

Injection accuracy is key. Real-time guidance allows the clinician to observe treatment progression from inserting the tip of the needle to advancing through overlying tissues to reach the target and aspirating fluid or injecting medication. With constant visualization, the clinician can change the injection approach, if necessary, to avoid unintentional damage to vessels and nerves and to determine whether accurate delivery is achieved. Musculoskeletal ultrasound may be used post-procedure to assess healing by noting the treated tissue’s organization and blood flow/inflammation status. Findings from various research studies show that musculoskeletal ultrasound provides improved treatment injection accuracy, better outcomes and, compared with MRI, improved patient comfort and pain relief. A study comparing ultrasound guidance to fluoroscopy reported significantly less procedural time with ultrasound for the injection of the glenohumeral joint. There is evidence that musculoskeletal ultrasound reduces diagnostic errors and reduces the number of patients who need advanced imaging, such as CT and MRI.
Our job is to determine how to best use the technology and resources to ensure the best possible patient care. Improvements in high-resolution gray-scale imaging and clinical expertise performing musculoskeletal ultrasound will undoubtedly continue. Development of digital beam formers, two-dimensional arrays along with exploitation of nonlinear techniques to achieve higher resolution and use of ultrasound contrast to improve flow sensitivity will all contribute to the utility of ultrasound in the musculoskeletal system. It behooves the Pain physicians community to become familiar with these techniques, not only for economic reasons, but also because of the rich complement of future applications of this modality. In addition to improved images of tissue morphology, ultrasound may play a role in functional and quantitative assessment of soft tissues. It may likewise play a role in the evaluation of prosthetic implants, bone mineralization, and cartilage integrity. Thus, the role of this modality in future musculoskeletal applications may significantly impact clinical diagnosis and therapy.
Abstract - Headache is prevalent in 66% of the global population and 6th highest cause for years lost to disability. Incidence of cervicogenic headache is 2.5-4.1 %. CGHISG diagnostic criteria, evaluation of patient with CGH and modalities of treatment like manual therapy, occipital nerve block, radiofrequency and occipital nerve stimulation will be discussed.
Chronic pancreatitis (CP) is a frequently painful disease state and its pain can be caused by several mechanisms. Localized inflammatory infiltration and ductal obstruction causing nociceptive pain. Central and peripheral sensitization causing neuropathic pain component. Abdominal pain is the most predominant symptom in CP which can influence quality of life, reduced food intake and misuse of narcotics.

**Management of pain from CP**

**Conservative treatment**

Management of CP is mainly directed at the treatment of persistent pain. Lifestyle changes like abstinence from alcohol and cessation of smoking are essential. Pharmacological management follows WHO pain ladder. Acetaminophen and NSAIDS for mild pain. Mild and strong opioids for moderate to severe pain in CP.

Membrane stabilizers and antidepressants are used as opioid sparing drugs for managing neuropathic pain in CP. Tricyclic antidepressants, selective serotonin reuptake inhibitors (SSRIs), and serotonin norepinephrine reuptake inhibitors (SNRIs) are frequently prescribed. Calcium channel blockers like pregabalin or gabapentin are effective in treatment of chronic pain from CP. Ketamine is also used for treating visceral hyperalgesia.

Pancreatic enzyme supplementation and Octreotide may help in controlling chronic pain mainly in small duct disease or minimal-change CP. Various endoscopic and percutaneous interventions may provide pain relief like extracorporal shock wave lithotripsy combined with endoscopic extraction of the stones, stenting with endoscopic drainage for stricture, Pancreatic sphincterotomy and endoscopic drainage of pseudocysts.

Psychological interventions like Biofeedback, Hypnosis and cognitive behavioural therapy should be considered along with medical management. A multidisciplinary chronic pain rehabilitation program that includes patient education, physical therapy, occupational therapy, medication management, individual psychotherapy, group therapy, cognitive therapy, thermal biofeedback, weaning of opioids and habituating substances, substance use education, and progressive muscle relaxation may provide both short- and long-term benefits in improving chronic pain.

**NERVE BLOCKS AND ABLATIVE AND NEUROMODULATION PROCEDURES**

Nerve blocks, ablative procedures, and neuromodulating techniques aim at interrupting or modulating neural/pain conduction. Splanchnic and celiac plexus blocks are performed percutaneously under fluoroscopic guidance or USG/CT guidance. Endoscopic USG guided celiac plexus block also given.
Splanchnic nerve blocks are frequently followed by radiofrequency (RF) denervation for prolonged pain relief. Two larger case series on the use of RF ablative procedures suggested a significant improvements in pain scores for patients who suffer from CP. The use of spinal cord stimulation (SCS) to treat visceral pain and pain from CP is promising. Several larger retrospective publications provided further evidence that SCS may be an effective long-term solution for those patients with severe CP.

**SURGICAL INTERVENTIONS**

Surgery for pain relief in CP should be considered if medical or endoscopic treatments do not provide satisfactory pain relief. Lateral pancreaticojejunostomy, minor sphincteroplasty, dual (biliary and main pancreatic duct) sphincteroplasty, Frey and DuVal procedures, Whipples and Total pancreatectomy are some of the surgical procedures.

**Conclusion**

Chronic abdominal pain in CP is a complex physical and psychological problem that requires an understanding of its clinical, physical, and psychosocial features and providing treatment options tailored to the needs of patients. An integrated biopsychosocial treatment plan combined with comprehensive treatment for chronic abdominal pain may offer better clinical outcomes. Despite the fact that celiac and splanchnic nerve blocks were long a part of the armamentarium of pain physicians, RF denervation of the greater and lesser splanchnic nerves to provide prolonged treatment effects needs to be studied in a formal, randomized, prospective study. SCS appears to be a robust yet minimally invasive therapy that has a promising future when it comes to pain control from CP. Comparative studies between surgery and endoscopic treatment show evidence in favor of early surgery.
Neuropathic pain (NP) being a common condition characterised by subjective negative and positive symptoms. This have a significant negative impact on a patient’s quality of life as symptoms range from numbness to debilitating pain. Pharmacotherapy is typically the first step in treating NP. Guidelines and consensus statements from various organisations around the world appear to be consistent with the classes of medications recommended for both general and specific types of NP, which include antidepressants and anticonvulsants. Even with these first-line therapies, the majority of patients may not experience complete pain relief.

Here we intend to discuss as a speaker for theme “Neuropathic Pain: Have we changed from definition to management”. This talk summarises available Guidelines for managing various aspects of pharmacotherapy treatments and compares recommendations from key organisations, including the National Institute for Health and Care Excellence (NICE), the Neuropathic Pain Special Interest Group (NeuPSIG) and the Canadian Pain Society, as well as other organisations.
Chronic pain is a major health care and expensive problem all over the world. With the introduction of biopsychosocial model of pain during the recent past scope increased for the development of effective both in terms of therapeutic and cost of the patient. This short text is focusing on the advantages of true interdisciplinary pain management programme and the evidence based outcomes.

The biomedical interventions like opioid medication and surgery does not give long term benefit to the patients suffering from pain and seek for other medications of treatment. Long term opioid management for the chronic pain only lead to psychological distress and opioid induced hyperalgesia.

The surgical interventions like spine surgeries and spine fixation are associated with high rates of disability and inadequacy of the pain relief.

The introduction of biopsychosocial model of chronic pain is now widely accepted and positively stimulated the concept of interdisciplinary pain management. Pain is widely regarded as a complex phenomenon involving biological nociceptive and hypothalamo-pituitary-adrenal axis activity as well as psychosocial and socioeconomic factors such as emotional disposition, cognition and attention.

It’s very vital to differentiate between multidisciplinary and interdisciplinary pain management otherwise it can lead to lots of confusion.

A clear distinction needs to be made between multidisciplinary and interdisciplinary pain management. Fortunately with the biopsychosocial model in mind very effective comprehensive interdisciplinary pain treatment programmes have been developed.

Multidisciplinary connotes the involvement of the several health care providers like physician, psychologist, physical therapist, and occupational therapist. The disadvantage of this system is the lack of integration of their services and they may not be located in the same facilities.

Interdisciplinary pain management consists of great coordination of the individual services in a comprehensive programme and frequent communication among health care professionals all providing care under one roof. It involves a common philosophy of reliable regular communication on a daily basis and active patient involvement.

The treatment and cost effectiveness of interdisciplinary pain management programmes have been well documented in the literature. Chou and colleagues in 2009 endorsed the use of interdisciplinary pain management for low back pain as a strong recommendation with a high quality evidence.

Oslund et al in 2009 researched on long term effectiveness of interdisciplinary pain management and found that patient reported improved outcomes across a range of domains pain severity, interference of pain with function.

Scascighini Toma (2008) determined that these programmes out performed the standard medical services and less coordinated multidisciplinary programmes.

Weiner and Nordin in 2010 proved that interdisciplinary pain programmes superior than other interventional pain programmes including medication and cognitive behavioral therapy. There is ample evidence to suggest that interdisciplinary pain management offer most cost effective long term treatment option.
Rodriguez and Garcia in 2007 found that interdisciplinary programmes resulted in fewer emergency room visits, primary care visits and medication use for pain management.

Early referral to interdisciplinary pain management highly recommended based on the evidence that first year chronic pain management expenditure is often most costly - Kronberg, Handberg & Axelsen 2009.

As the chronic pain management programmes are for long term, evidence reports that primary health care home providers involved in interdisciplinary programmes so that after the patient leaves the specialty care programmes will follow with the primary home care providers – Rothman and Wayne 2003

Conclusion:

Chronic pain is a significant and expensive problem all over the globe including India. Inspite of significant progress in managing with best treatment approaches there are still difficulties in progressing towards the realization of the benefits of these treatments. There are evidences available to support the cost effectiveness of interdisciplinary treatments for chronic pain conditions.

The IASP definition of interdisciplinary pain care has greatly benefited the field by providing a blue print for establishing the best models of pain clinics.

However there still seems to be some confusion within the profession about how to define and develop the true interdisciplinary pain care model. Once established the interdisciplinary programs greatly enhance the effectiveness of treatment for chronic pain sufferers.
Pain continues to be a significant symptom burden in cancer patients, with prevalence in 53% of patients at all stages of cancer and as high as 58% to 69% in those with advanced cancer. [1] The WHO ladder approach to cancer pain management is effective in 71% of the patients [2], though effectiveness is not achieved quickly in a third of the patients.[3] There has been a paradigm shift away from the World Health Organization (WHO) ladder to the use of interventional modalities early in the treatment of cancer [4]. Pain physicians are recognizing the need for interventional procedures early in the course of cancer-related pain to avoid unnecessary suffering and morbidity.[5, 6] The interventions include neurolysis of the celiac/splanchnic, superior/inferior hypogastric and ganglion impar plexus, intrathecal drug delivery, spinal cord and peripheral nerve stimulators, vertebral augmentation, image-guided tumor ablation, and other less commonly performed neurosurgical and neuraxial/peripheral nerve neurolytic procedures. The advent of neuromodulation has led to a decline of the use of neurosurgical ablative procedures.

Neurosurgical procedures to treat pain are mainly destructive and play a role in patients with intractable cancer pain and a short life expectancy. These procedures are performed by neurosurgeons and pain physicians with advanced training in these skills. Patient selection and education are key for optimal results. These are performed under CT guidance and limited to neurosurgeons and pain physicians trained in these techniques. It is imperative to have a good understanding of patient selection, risks, benefits associated with these procedures and adequate training and skill to do these procedures to optimize outcomes and minimize complications.

The targets for destruction include the spinothalamic tract, the trigeminal tract nucleus, and the midline ascending visceral pain pathway, the brainstem spinal lemniscus, the thalamus, and the cingulate gyrus.[7] Some of the ablative therapies for cancer include cordotomy, myelotomy, sympathectomy, peripheral neuroectomy, dorsal rhizotomy and ganglionectomy, dorsal root entry zone lesioning. Of all these procedures, cordotomy and myelotomy are the most commonly performed ones. Cordotomy is indicated for unilateral localized nociceptive pain and the target is the lateral spinothalamic tract, and has shown good and lasting pain relief.[8] Rarely is it used in treating bilateral pain due to the risk of Ondine’s curse from interruption in the spontaneous respiratory drive. Commissural or midline myelotomy involved radiofrequency lesioning or a mechanical lesion to disrupt the ascending visceral pain pathway for treatment of intractable abdominal and pelvic pain. Trigeminal tractotomy involves destruction of the spinal trigeminal tract and the nucleus caudalis, located at the first third of lateral midline and lateral surface of the upper spinal cord. DREZ lesioning involves ablation of the dorsal rootlets (lateral portion) and the hyperactive portions of the Lissauer’s tract and dorsal horn. This procedure is indicated for segmental pain associated with peripheral nerve/root and or spinal cord lesions. These can be performed by using microsurgical, radiofrequency, ultrasonic and or laser ablation.

Neurosurgical procedures: [7]
Inadequately managed pain can lead to adverse physical and psychological patient outcomes for individual patients and their families. The inability to get away from pain may create a sense of helplessness and even hopelessness, which may predispose the patient to more chronic psychological issues. The resultant behaviour when pain is managed inadequately often leads to unwillingness to seek medical care for other health problems (Wells N. et al., 2008).

Psychosocial factors also play an important role in determining who develops chronic pain and how a given individual responds to pain in terms of functional status, adaptation, and development of disability (Pincus T. et al., 2002). Some clinicians at times confuse psychological factors with psychiatric illnesses (e.g., depression, anxiety etc.). While psychiatric illnesses can accompany chronic pain or result from persistent pain, there is little evidence suggestive of psychiatric illnesses being the root cause of most chronic pain conditions (Campbell LC. et al., 2003).

Therefore, in order to gain a holistic understanding of the patient who is undergoing chronic pain, information about pathophysiology (Bio), psychological (psycho) and social factors (social) need to be assessed and integrated for diagnostic purposes and treatment planning.

Objectives:

- Introduction of Psychology in Pain management
- Understanding the Bio-Psycho-Social Model of Pain
- Psychological assessments and interventions for understanding Pain
Introduction: Regenerative medicine is a new emerging branch in the field of medicine involving the regeneration of damaged tissue and organ and also the functional restoration. The two important technology playing a pivotal role is stem cell and platelet rich plasma (PRP) therapy. PRP therapy is the use of concentrated platelets for regeneration of a tissue by releasing numerous growth factors. Stem cells are undifferentiated immature cells that can divide and replace the worn out tissues.

Stem cells:

Stem cells are unspecialized cells with two important characteristics, one is its ability of self renewal and the second is its ability to differentiate into various adult cells. These two important features makes it liable for its use in regenerative medicine. There are multiple types of stem cell but broadly can be classified into embryonic and adult stem cells. Embryonic stem cells are pluripotent that is it can differentiate into all derivatives of three germ layers. Adult stem cells are multipotent and has the ability to differentiate into progenitors of only one germ layer. For therapeutic uses in regenerative medicine adult mesenchymal stem cells( MSCs) are considered to be having maximum efficacy . Mesenchymal cells are the adult stem cells with the ability to differentiate into mesenchymal tissues including muscle, bone, fat, ligaments, tendons, cartilage. There are multiple sources like bone marrow, adipose tissues, blood although the one extracted from bone marrow delivers the maximum results. Mechanism of action of stem cells- there are two ways through which stem cells act, first is via paracrine effect that is secrete growth factors and cytokines that regulate endogenous tissue regeneration and modulate the immune responses and inflammation of several disease and the second one is by differentiating into multiple cell types which helps in removing the degenerated tissue.

Its role in pain medicine:

Stem cells plays important role in multiple chronic pain conditions and musculoskeletal conditions like osteoarthritis/ rheumatoid arthritis, Discogenic pain, Tendonitis, Meniscal tear, Partial rotator cuff injuries, labral tear, Achilles tendonitis . Numerous studies on animals and humans have the proved the efficacy of stem cells in regeneration of tissues and organs although there are few studies which do not prove its efficacy for the same.Osteoarthritis is the most common condition for which regenerative therapy is used. MSCs have chondrogenic potential leading to regeneration of the degenerated cartilage. The anti inflammatory property of stem cell decreases the pro inflammatory mediators and cytokines thereby decreasing the pain in osteoarthritis. Nucleus pulposus of a degenerated disc shows to have MSCs that are similar to MSCs removed from bone marrow and also the Transplanted MSCs induce production of extracellular matrix proteins, proteoglycans including aggrecan and type 1 and2 collagen ,thus helping in discogenic pain.In neuropathic pain conditions MSCs helps by modulating the inflammatory cytokine production, stimulating the production of bioactive molecules and growth factors, MSCs also have the ability to differentiate into chondrocytes and repair the damaged tissues by producing the bioactive agents.

Stem cells play important role in tendonitis by Tendon derived stem cells (TDSCs) are considered of extreme interest for rotator cuff repair enhancement.

Summary- Role of stem cells in pain medicine is well established now, although a lot more work needs to be done to prove its efficacy. The success of stem cells depends on the appropriate collection of stem cell and delivering it at the correct site.
In 6 – 8% of the general population, acute neuropathic (NeP) leads to persistent neuropathic pain (PNeP). It leads to significant negative effect on physical and mental health, as well as Health related quality of life.

Appropriate treatments targeting the modifiable factors in high-risk patients may reduce the incidence of conversion of acute to persistent NeP. However, knowledge about factors that contribute to the persistence of NeP is lacking, which makes the treatment a challenge for health care.

Important common factors during the acute phase of pain, that increase the likelihood of persistence of PNeP are old age, mental health disorders, high intensity of acute pain and sensory changes.

Incidence of Post-herpetic neuralgia (PHN) is higher following Herpes Zoster infection in older men, with shorter and intense rash, when anti-viral therapy is missed and a pre-infection injury to the area. Vaccination against varicella zoster virus reduces the incidence of PHN. Early identification of high-risk patients during acute phase and treatment with combination of anti-viral therapy, adequate analgesia and sympathetic blocks can reduce the incidence of PHN.

Post-surgical PNeP is relatively common and under reported problem, especially in breast, cardio-thoracic and abdomino-pelvic surgeries. Significant pain with neuropathic characteristics at 48 hours post-op, high BMI and psychological distress increase the incidence of persistence of NeP. Meticulous surgical technique can reduce its incidence. Pre-emptive use of analgesia, especially regional analgesia, reduces the incidence by reducing central sensitization. Peri-operative use of Ketamine, Gabapentinoïds and intravenous Lignocaine also reduce the incidence. Use of Cognitive behavioral therapy can have a role as well.

Incidence of Diabetic neuropathy increases with duration of illness, age and poorly controlled hyperglycemia. Other associated factors are hypertension, obesity, metabolic syndrome and vitamin D deficiency. Good long-term blood sugar control and management of other modifiable factor can reduce the incidence of diabetic neuropathy.
Sickle cell disease is a genetic hemolytic disorder which is highly prevalent in Africa, the Middle East, Mediterranean regions, and Southeast Asia. World Health Organization has recognized sickle cell disease as a global public health problem due to population mobility, with increased migration from high to low-frequency sickle hemoglobin areas. Structural changes in amino acid sequences of the globin chain of the hemoglobin molecule occur due to a point mutation. Mutation of the hemoglobin induces polymerization of Hb S molecules with the red blood cell thereby distorting red blood cell (sickling). Premature red blood cells destruction (hemolysis) and vaso-occlusion are the most frequent manifestations of sickle cell disease. Dehydration of red blood cells contributes to vaso-occlusion as dehydrated cells adhere to vascular endothelium obstructing blood flow.

A vaso-occlusive crisis is the hallmark of sickle cell disease and can lead to an acute and painful crisis. It is also known as a sickle cell crisis, vaso-occlusive crisis or vaso-occlusive episode. The patient may report pain in the joints, extremities, back or chest. Pain can occur anywhere and may last for several days or weeks. The frequency and severity of the painful episodes vary between the individual patients and more common in adolescents and adults. Pain in muscles and bone may both present as an acute episode and patient may experience recurrent pain episodes of varying frequency and quality. In most of the patients precipitating factor are not known, but primarily precipitated by exposure to cold, dehydration, intercurrent infection, physical exertion, tobacco smoke, alcohol use, hypoxic conditions, physical pain, pregnancy, hot weather, emotional stress, or onset of menstrual cycle. Recurrent attacks of acute severe painful crises, if not appropriately managed and adequately, leading to chronic pain syndrome.

Mild to moderate pain can be managed by simple analgesics at home. If pain management is not successful at home patients should be referred to an emergency department (ED). Primary management whether at home or ED, should be focused on rapid pain control, whereby fluids and analgesics to be administered immediately. Management of acute sickle cell painful episodes in the ER should follow proper assessment, treatment with analgesics/adjuvants, coordination of care, monitoring, outcome, and disposition. An acute painful episode should be treated as an acute emergency. Discuss the previous treatment history, concerns, plan appropriate treatment regimens and provide psychological and social support if needed. Prompt analgesia should be given (within 30 minutes) preferably a potent opioid. Assess the pain relief at regular intervals and should be monitored appropriately after that. Consider patient-controlled analgesia if boluses are needed at short intervals. Always observe for the possible acute complications, e.g., acute chest syndrome and other complications like acute stroke, aplastic crisis, infections, osteomyelitis, and spleen sequestration. Patients with chronic pain may require medications used in chronic neuropathic pain, opioids and psychological support. Apart from medications these patients may require regular blood transfusions and hydroxyurea therapy.
Topic - Let Me Sprint Again: Short term Access
Dr. Preeti Gupta

Principle of Intrathecal Drug Delivery

- Effective analgesia can be achieved by the action of some drugs at the **dorsal horn** of the spinal cord
- Adequate concentrations cannot be achieved by systemic administration, or achieved only by high systemic doses

**Means of achieving enhanced therapeutic effects**

- Smaller doses needed which allow a reduction in side effects compared to systemic administration
- Management of **pain and spasticity**

Types of systems

1. Percutaneous catheter (tunneled or not tunnelled) used with an external pump.
2. Totally implanted catheter with a subcutaneous injection port connected to an external pump

Choice of system

- **Cancer** or non-cancer **aetiology**
- **External pumps** are used more in the management of **cancer** pain
- Life expectancy of the patient

Selection Criteria

- Clear organic **pain generator**
- No psychological or sociological contraindication
- Documented responsible behaviour and stable social situation
- **Good pain relief** with oral or parenteral opioids
- **Intolerable side effects** from systemic opioid therapy
- Baseline neurological exam and psychological evaluation
- **Failure of more conservative therapy** including trials with nonopioid medications and nerve blocks
- Constant or almost constant **pain** requiring around-the-clock opioid therapy
- High degree of **tolerance to opioids** may limit effectiveness of intrathecal therapy
- No tumour encroachment of thecal sac in cancer patients
- Life expectancy > 3 months (debatable)
- No practical issues that might interfere with device placement, maintenance, or assessment (e.g., morbid obesity, severe cognitive impairment)

**Positive response to an intrathecal trial**

Drugs used

- Opioids
- Local anaesthetics
Topic - Hip Joint - Mystery, Clues and Treasures
Dr. G K Kumar

Hip pain is a common and disabling condition that affects patients of all ages. The differential diagnosis of hip pain is broad, presenting a diagnostic challenge. The Hip joint the body's largest is a ball and socket synovial joint and is formed by the articulation of pelvis with femur and connects the axial skeleton with lower extremity. The hip joint can withstand repeated motion and a fair amount of wear and tear. Despite its durability, the hip joint isn't indestructible. With age and use, the cartilage can wear down or become damaged. Muscles and tendons in the hip can get overused. Bones in the hip can break during a fall or other injury. Any of these conditions can lead to hip pain. Hip pain is traditionally associated with older adults, but everyone from young athletes and even non-athletes can be at risk for developing this hip problem.

Incidence of hip pain

T.Dawson J et al, noted that the percentage reporting hip pain was 19.2% in a cross-sectional postal survey of a random sample of 5500 Oxfordshire residents aged 65 yr and older. F.Cecchi et al noted 11.9% had hip pain in a community sample of an Italian persons aged 65 yr and older. Hip pain is not always related to older age. It can be noted significantly among the adult population too.

Groin pain is a frequent cause of discomfort in young and active patients. In sports, incidence rates of groin pain vary from 0.5 to 18%, depending on level and type of sport noted by Maarten A. et al, in their study of Incidence of symptomatic femoroacetabular impingement in the general population at 2016. Hip joint pathology was the most common clinical entity (55.98%) as per A 6-Year Review of 894 Cases of aged 26 -30 years with sports activity, by Alan T. Rankin et all (2015).

Etiology of hip pain - The Mystery

So the differential diagnosis of groin pain is broad and contains both sports-related and non-sports-related conditions.

Hip disorders are often due to developmental conditions, injuries, chronic conditions, or infections. These are some of the conditions that commonly cause hip pain:

Arthritis. Osteoarthritis and rheumatoid arthritis are among the most common causes of hip pain, especially in older adults. The pain gradually gets worse. People with arthritis also feel stiffness and have reduced range of motion in the hip.

Hip fractures. With age, the bones can become weak and brittle and are more likely to break during a fall.

Bursitis. Bursae are sacs of liquid found between tissues such as bone, muscles, and tendons. Inflammation of bursae is usually due to repetitive activities that overwork or irritate the hip joint.

Tendinitis. It’s usually caused by repetitive stress from overuse.

Muscle or tendon strain. Repeated activities can put strain on the muscles, tendons, and ligaments that support the hips. When they become inflamed due to overuse, they can cause pain and prevent the hip from working normally.

Hip labral tear. Athletes and people who perform repetitive twisting movements are at higher risk of developing this problem.

Cancers. Tumors that start in the bone or that spread to the bone can cause pain in the hips, as well as in other bones of the body.
Avascular necrosis (also called osteonecrosis). Avascular necrosis most often happens in the hip. It can be caused by a hip fracture or dislocation, or from the long-term use of high-dose steroids (such as prednisone).

Other causes. Chronic inflammatory arthritis, and developmental disorders.

Symptoms of Hip Pain

Depending on the condition, pain may be felt in different location around the hip joint. Patients often express that their hip pain is localized to one of three anatomic regions: the anterior hip and groin, the posterior hip and buttock, or the lateral hip.

Depending on site of pain the causes are,
1. Anterior hip /Groin pain - commonly associated with intra-articular pathology, such as osteoarthritis and hip labral tears
2. Posterior hip pain /Gluteal pain - associated with piriformis syndrome, sacroiliac joint dysfunction, lumbar radiculopathy, and less commonly ischiofemoral impingement and vascular claudication
3. Lateral Hip pain /Thigh Pain - occurs with greater trochanteric pain syndrome

Hip Pain Assessment

The successful treatment of your hip pain requires a comprehensive and accurate assessment of the hip joint by examining
1. Entire lower limb (foot, ankle, knee, hip)
2. Lumbar spine
3. Pelvis and SIJ function and alignment
4. Upper thigh muscle length and strength (e.g. quadriceps, adductors, hamstrings, and ITB)
5. Deep hip muscle control and activation patterns
6. Middle and superficial hip muscle control, strength and function
7. Neural tissue extensibility e.g. sciatic and femoral nerve

Clinical examination tests, although helpful, are not highly sensitive or specific for most diagnoses; however, a rational approach to the hip examination can be used. Radiography should be performed if acute fracture, dislocations, or stress fractures are suspected. Initial plain radiography of the hip should include an anteroposterior view of the pelvis and frogleg lateral view of the symptomatic hip. Magnetic resonance imaging should be performed if the history and plain radiograph results are not diagnostic. Magnetic resonance imaging is valuable for the detection of occult traumatic fractures, stress fractures, and osteonecrosis of the femoral head. Magnetic resonance arthrography is the diagnostic test of choice for labral tears.

Ultrasound - The Clue
Role of Ultrasound

Diagnostic ultrasound is increasingly used in the sports medicine office for visualization for most musculoskeletal complaints. Ultrasound is useful in visualizing the fluid collections that are present with iliopsoas or greater trochanteric bursitis, as well as for demonstrating hematomas from acute quadriceps strains. Tendons can easily be seen, and partial or complete tendon ruptures and avulsions can be determined. The iliopsoas, gluteus medius, proximal hamstring, and rectus femoris tendons are all easily visualized.

Ultrasound Examination

Hip Ultrasound examination is extremely useful for the evaluation of a snapping hip to determine the exact tendon involved, such as the iliopsoas snapping over the pelvic ring, or the tensor fasciae latae snapping over the greater trochanter.
Diagnostic & Therapeutic Ultrasound guided Intervention

Ultrasound can also be used to guide procedures such as injections into a tendon sheath to inject, and the hip joint itself or it is a cyst to aspirate. In some cases, ultrasound is used to guide cortisone or hyaluronic acid injections into the joint (visco supplementation) an effective treatment for some kinds of hip conditions, such as arthritis.

Hip Ultrasound - The Treasure

Hip USG images are used to evaluate abnormalities of the muscles, such as tears and soft-tissue masses, foreign bodies, bleeding, infections or other types of fluid collections, benign and malignant soft tissue tumors, early changes of arthritis, developmental dysplasia of the hip (DDH). Ultrasound of the hip can be performed on infants with DDH up to approximately six months of age.

Ultrasonography is a useful technique that provided 'CLUES' for evaluating individual tendons, confirming suspected bursitis, and identifying joint effusions and functional causes of hip pain. Interventional Ultrasonography is a really 'TREASURE' especially useful for safely and accurately performing imaging-guided injections and aspirations around the hip.

References

6. F. Cecchi et al, Epidemiology of hip and knee pain in a community based sample of Italian persons aged 65 and older, Osteoarthritis Cartilage, 2008, September 16(9).
Topic – Vascular Ischaemic Leg and foot pain
Dr. Sanjay Khanna

This type of pain is encountered in patients of Peripheral Vascular Disease. Pain is Nociceptive in nature and is deep aching ischemic Pain and pain from Ischemic Ulcers and the Ischemic penumbra encircling the Gangrene. This pain responds to Opioids. Deep Aching Ischemic pain responds to Spinal Cord Stimulation. The Ulcer pain is merely masked as long as the Paresthesia’s persists due to stimulation. Acute pain of Ulcer dressing is not controlled by SCS.

Spinal Cord Stimulation was originally used to treat only Neuropathic pain. Now it is well known certain nociceptive pains respond to SCS and the rest of the Nociceptive pains do not respond.

The Primary Indication for SCS in Ischemic Leg Pain is Stage 111 Fontaine Scale.
Stage 1 Asymptomatic Oligosymptomatic.
Stage 2 Intermittent Claudication on walking a certain distance and disappears after rest.
Stage 3 Rest Pain mainly in the Forefoot when limb is horizontal and relieved when the limb hangs down.
Stage 4. Rest Pain with Ulceration and Gangrene.

Critical Limb Ischemia is defined as persistent and severe pain in the foot at rest preventing sleep and requiring repeated analgesics.

Presently as per the 2nd European Consensus of Critical Limb Ischemia in Diabetic and Non Diabetic Patients is defined as:-
Persistently occurring Ischemic rest pain requiring analgesics for more then 2 weeks.
Ankle Systolic Pressure< 50 mm of Hg.
Toe Systolic Pressure less then 30 mm of Hg
Transcutaneous Oxygen Pressure <10 mm of Hg which does not increase on inhalation of Oxygen.

In Diabetic patients alone, sensory neuropathy can cause pain in absence of Ischemia. In these patients Toe Systolic Pressure is evaluated which can be falsely high due to Mockeberg Sclerosis of the media. If the Toe Systolic Pressure is less then 30 mm of Hg then it carries a grave prognosis in Diabetic patients.

Critical Limb Ischemia occurs when the feeding Artery is Stenosed or Obstructed. Proximal Vascular resistance is increased severely and blood flow is compromised and the nutritive requirement of the resting limb cannot be met.

Causes of PAOD(Peripheral Artery occlusive Disease.)

1. Atherosclerosis.
2. Inflammatory Arteritis of medium sized arteries.
3. Diabetic microangiopathy.

Pathophysiology of microcirculatory changes.
Plaques are formed in the intima of the arteries and cell proliferation occurs accompanied by thrombi formation. Vessel lumen is narrowed and distal blood is impeded. Plaques rupture or
Ulcerate and Platelets and Leucocytes are activated. Impaired Prostacyclin and Fibrinolytic activity results in arterial thrombosis.

Pathophysiology of microcirculation

Microcirculation comprises of Arterioles, Venules, Capillaries and Pre-Lymphatic vessels. Changes similar to Macrocirculation occurs in microcirculation along with abnormal vasomotion. Compensatory responses like Vasodilation and formation of collaterals take place but in due course they are inadequate measures and Ulceration and Gangrene results. Maldistribution and reduced blood flow occurs.

Role of Spinal Cord Stimulation (SCS)

Hypothesis of Mechanism of Action
1. Pain Signals are directly dampened.
2. Vasodilation occurs due to Antidromic activity of sensory nerves.
3. Vasodilatory substances are released.
4. Vasodilation due to modulation of the activity of the Autonomic nervous System mainly the Sympathetic system.
   Vasodilation results in alleviating pain.

DORSAL COLUMN STIMULATION

Done at C1& C2 Level produces Vasoactive changes which are independent of pain alleviating effects. It decreases the afterload and optimizes the Cardiac output resulting in the improvement of Cardiac Output

Subthreshold stimulation of SCS producing changes in Skin Temperature recorded by Thermography from blue green colour (lower skin temperature) to yellow colour(warmer)proving rise in Skin Temperature.
Chronic pain is defined as any pain that lasts more than three months in duration. This can apply to all types of pain like neuropathic, sympathetic, nociceptive as the case may be. Pain itself being very varied and difficult to quantify formulating guidelines for its management is really a daunting task. Therefore it is not surprising that there are as many guidelines and suggestions as there are nomenclatures for pain. There are numerous societies that have published their own guidelines and to make sense out of all these can be very challenging. Invariably there are many overlaps amongst these guidelines. The greatest problem we face is the lack of robust evidence in pain therapy. Most of the studies report a 1-2 difference in pain scores when comparing drugs or techniques and it doesn’t translate into useful practical help. What we as pain physicians will need is at least a 30-50% reduction in pain over a meaningful time frame, say 12-24 hours, which is what the patient expects when they consult us. There are very few if any such studies reporting results in this way and this makes our task all the more difficult. So is the case with the societies or authors trying to make sense of pain studies while framing guidelines for practice. In such a scenario to collate the available guidelines, reviews and meta-analyses to make a consolidated statement is almost impossible if not herculean. (21)

This is a meek attempt to present the various viewpoints of the authors and to put together the suggestions in one place. Keeping in mind the common pain conditions that we face in our daily practice, the available evidence has been categorized in the following order in this review. The relevant references have been mentioned alongside the pain categories.

In chronic low back pain as per the American college of Physicians (1-3)

First line – NSAIDs
Second line – Tramadol or Duloxetine
Third line – Opioids
TCAs & SSRIs – did not improve pain
(Grade: weak recommendation, moderate - quality evidence)
In chronic musculoskeletal or arthritis pain – NSAIDs and/or PCM (careful in elderly)
TCAs, SNRIs, Gabapentinoids – as adjuvants for central pain, fibromyalgia and neuropathic pain
Opioids (with careful monitoring)

Sign guidelines for chronic pain (4,5)

LBA and OA – NSAIDs and / or PCM
When oral drugs fail / not tolerated – topical NSAIDs, capsaicin 8%, lignocaine (PHN) and rubicacents (MSK)
Opioids – try rotation (SE), monitoring (UDT) and caution if dose >180 MME
Gabapentin (upto 1200mg/d) – neuropathic pain
Pregabalin (upto 300mg/d) – neuropathic pain and fibromyalgia
TCAs – not recommended [only Amitryptilne (25-125 mg/d) for fibromyalgia with neuropathic pain]
The Global Spine Care Initiative: for low and middle-income communities. Backache without radiculopathy

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Benefits</th>
<th>Harms</th>
<th>Resources</th>
<th>Feasibility</th>
<th>Recommendation</th>
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<tr>
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<tr>
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<td>Low–moderate</td>
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**Backache with radiculopathy**

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The Lancet neurology published the NeuPSIG guidelines in 2015 as a summary

In a review of Neuropathic pain in 2017 the following summary was published comparing the various guidelines (8)
Chronic pain after surgery (9)

No evidence - gabapentin, pregabalin, NSAID’s, IV steroids, oral NMDA blockers, oral mexiletine, IV fentanyl, IV lidocaine, oral venlafaxine or inhaled nitrous oxide

Modest effect for ketamine, compared to placebo

The present evidence for the use of Cannabinoids (10)

It seems unlikely that cannabinoids are highly effective medicines for CNCP.

There is moderate-high grade evidence for use of nabiximols to achieve modest reductions in pain as adjunctive therapy in MS-related pain.

However, NNTBs were high and NNTHs low, with high rates of dropout for AEs, and long-term efficacy and safety is unknown.

Only minimal evidence that cannabinoids are effective in improving emotional and physical functioning.

Cannabinoids are unlikely to be a monotherapy for CNCP. Only multi-modal strategy will help these patients

The present evidence for the use of Ketamine (11,12)

This meta-analysis found moderate evidence for efficacy during chronic intractable non-cancer pain in adults

Further studies needed to define indications, timing and duration of infusions, optimal dosage and regimes, and the timing of side effects associated with its administration

- For spinal cord injury pain, there is weak evidence to support short-term improvement (Grade C, low certainty)
- In CRPS, there is moderate evidence to support improvement for up to 12 weeks (Grade B, low to moderate certainty)
- For other pain conditions such as mixed neuropathic pain, fibromyalgia, cancer pain, ischemic pain, headache, and spinal pain, there is weak or no evidence for immediate improvement (Grade D, low certainty)
- Bolus: up to 0.35 mg/kg (Grade C, low certainty)
• Infusion: 0.5-2 mg/kg per hour, although up to 7 mg/kg per hour have been successfully used in refractory cases in ICU settings (Grade C, low certainty)
• There is evidence for a dose-response relationship, with higher dosages providing more benefit. Total dosages be at least 80 mg infused over >2 h (Grade C, low certainty)
• A positive response should include objective measures of benefit in addition to satisfaction such as ≥30% decrease in pain score or comparable validated measures for different conditions (eg, Oswestry Disability Index for back pain)
• (Grade C, low-to-moderate certainty)

For CRPS (13, 14)

Mild-to-moderate pain: Simple analgesics and/or blocks
Excruciating, intractable pain: Opioids and/or blocks or later, more experimental interventions
Inflammation/swelling and edema: Steroids, systemic or targeted (acutely) or NSAIDs (chronically); immune modulators
Depression, anxiety, insomnia: Sedative, analgesic antidepressant/antipsychotics and/or psychotherapy
Significant allodynia/hyperalgesia: Anticonvulsants and/or other Na channel blockers and/or NMDA receptor antagonists
Significant osteopenia, immobility and trophic changes: Calcitonin or bisphosphonates
Profound vasomotor disturbance: Ca channel blockers, sympatholytics, and/or blocks

As per NICE guidelines for CRPS:
• Drugs as per NICE neuropathic (non specialist) and the ‘strong recommendations’ of NeuPSIG (IASP) should be used
• Pamidronate (single dose 60 mg IV) should be considered for CRPS <6 months.
• No evidence - Intravenous regional sympathetic blocks (IVRSB) with guanethidine, Low-dose IVIG or lenalidomide

For HIV patients with neuropathic and chronic pain (15)

Early initiation of ART is recommended for the prevention and treatment of HIV-associated distal symmetric polyneuropathy (strong, low)

− Gabapentin - neuropathic pain first-line (strong, moderate)
− Second line - SSRI, TCA or Pregabalin (weak, moderate)
− Capsaicin (topical) (strong, high)
− Medical cannabis (weak, moderate), Alpha lipoic acid (ALA) (strong, low) can be used
− Lamotrigine NOT to be used (strong, moderate).
− PCM and NSAIDs first-line agents for musculoskeletal pain (strong, high).
− Tramadol taken up to 3 months in osteoarthritis (weak, moderate).

The evidence published by American academy of neurology for post herpetic neuralgia (PHN) (16)
The guidelines as per Canadian Family physicians for Headache in adults (17)

**Migrane**

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<tr>
<td>Ibuprofen 400 mg, ASA 1000 mg, naproxen sodium 500–550 mg, acetaminophen 1000 mg</td>
<td>Triptans: oral sumatriptan 100 mg, rizatriptan 10 mg, almotriptan 12.5 mg, zolmitriptan 2.5 mg, eletriptan 40 mg, frovatriptan 2.5 mg, naratriptan 2.5 mg</td>
</tr>
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- Subcutaneous sumatriptan 6 mg if the patient is vomiting early in the attack. Consider for attacks resistant to oral triptans
- Oral wafer: rizatriptan 10 mg or zolmitriptan 2.5 mg if fluid ingestion worsens nausea
- Nasal spray: zolmitriptan 5 mg or sumatriptan 20 mg if patient is nauseated

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<tr>
<th>Antiemetics: domperidone 10 mg or metoclopramide 10 mg for nausea</th>
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<td>Third</td>
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**Tension type headache**

**Cluster headache**
The management of pain in Children with medical illnesses (18)

Only 2 steps of WHO ladder in children (Strong recommendation, very low quality of evidence)

PCM & Ibuprofen for mild and Morphine for mod-severe pain
(Strong recommendation, low quality of evidence)

Codeine and Tramadol NOT recommended

Corticosteroids, bisphosphonates NOT to be used as adjuvants (Weak recommendation, very low quality of evidence)

At present, NO recommendation for / against TCA, SSRI, anti-convulsants, ketamine & LA as adjuvants for Neuropathic pain

At present, NO recommendation for benzodiazepines &/or baclofen as adjuvant for pain with muscle spasm and spasticity.

The available evidence for treating Diabetic peripheral neuropathy (19)

- Pregabalin or Duloxetine as initial drug for neuropathic pain in diabetes (A)
- Gabapentin may also be used as initial drug, considering patients’ SE status, comorbidities, and drug interactions (B)
- Although not approved by FDA, TCA’s are also effective but with risk of serious side effects (B)
- Due to high risk of addiction, the use of opioids, including tapentadol / tramadol, is NOT recommended for DSPN (E)
- (A) Duloxetine (SNRI) (60 mg/day) should be considered if other first / second line agents have failed.
- (A) Duloxetine (60 mg/day) should be considered for fibromyalgia or osteoarthritis.
- (B) Fluoxetine (SSRI) (20-80 mg/day) should be considered for fibromyalgia.
The final summary borrowing heavily from the Cochrane review (20)

• There is **NO** evidence to support the use of high dose opioids (≥200 mg Morphine equivalent daily) in chronic non-cancer pain.
• A review of Gabapentin in neuropathic pain suggested that after shingles, 3 in 10 people had their pain reduced by 50% (≥1200 mg daily), whereas 2 in 10 had the same response with placebo.
• A systematic review of the use of Botulinum toxin for myofascial pain syndrome concluded that there was "inconclusive" evidence to support its use
• There was **NO** supportive unbiased evidence for a beneficial effect for amitryptiline in neuropathic pain.
• A review of opioids for pain associated with rheumatoid arthritis suggested there was "limited evidence" for the efficacy of weak opioids up to six weeks and no evidence for the use of strong opioids.
• For prevention of chronic pain after surgery a systematic review of pharmacotherapies suggested that better designed trials were needed and that there was **NO** current evidence to support the use of a multitude of interventions

References:


Excellence in medical documentation reflects and creates excellence in Medical care. Adequate medical documentation assures patient confidentiality and ensures patient care standards are met. Documentation is the legal protection to the Doctor and Patient in case of disagreement over care. Many physicians complain that they do not have time to write sufficient records. The question they have to answer in that case is “would you rather spend time in the court minimum of 12 weeks, 5 days in the week from 9 am to 5 pm and also face endless harassment?” A fully documented Medical Record can forestall a legal suit and help in continuity of care. A poorly documented record can lead the court to aggressively pursue the damages claim. One may be a highly credentialed Physician, who does a great work and bill only what procedure he / she has done. But if the documentation is not done sufficiently of the work done, it will be considered as if the work has not been done and the claim will not be honored by the paying agency. Any health care activity a) If it is not documented – then it did not happen; b) If it cannot be understood – then it did not happen; c) If it cannot be read – then it did not happen. d) if it did not happen – then it should not be paid. To summarize, consequences of failure to document is profound and grave. Earlier you realize and make it a practice better documentation it is better. A simple truth - Prevention is better than cure should be remembered by every clinician while discharging their duties and practice appropriate documentation to avoid unnecessary stress, pain and despair later on which they may regret for life. So come let us together learn the do’s and don’ts of Medical Documentation for our own safety and start practicing it today and every day. Remember - “The palest ink is better than strongest memory”
Pain remains a poorly understood and managed symptom even now. After 25 years of pain education, we still are limited in our understanding of the mechanisms involved in pain pathways. The interindividual differences and inter-differences in the types of pain are still a mystery.

Treatment of pain-related suffering requires a good knowledge of the know-how of how pain signals are generated, initiated, transmitted, interpreted, and eventually perpetuated at the higher levels. Not to forget the modulation it undergoes in its course as a protective phenomenon.

To unravel the said, ample research has gone in. The modalities of fMRI, PET studies, and DTI have given us insight into the changes in the brain in response to pain. The epigenomic and Molecular studies have complemented further understanding of the mechanisms of pain and subsequently the response to treatment.
SUMMARY

People often think of pain as purely a physical sensation. However, pain has biological, psychological and emotional factors. Furthermore, chronic pain can cause feelings such as anger, hopelessness, sadness and anxiety. To treat pain effectively, you must address the physical, emotional and psychological aspects.

We as pain physicians always come across patients with psychological element as a co-morbid condition during our routine practice. Understanding the pathophysiology and proper diagnosis is must before you plan the further treatment. There are many patients suffering from atypical facial pain, low back pain, cervical pain and abdominal pain where we do not find any physical signs and the relevant investigations are normal but we still have to address and treat the individual.

Unfortunately as a pain consultant, we don’t have any physical means to appropriately diagnose except to keep this aspect in the back of our mind and then come to a conclusion to treat the person differently.

It is certain that no intervention can treat psychological ailments, in fact some of these patients are more than willing to undergo intervention but the outcome is always disappointing for us.

Treatment of chronic pain, co-morbid condition with psychiatric ailment is more challenging as the drug interactions are to be kept in mind, behavioral therapy, relaxation technique and proper follow up is an integral part of the management.

Depression is the most common symptom in chronic pain patients. The pain physician should keep in mind about the psychological aspect while treating the chronic pain individual.

CONCLUSION

Multidisciplinary approach is mandatory in treating such complex clinical conditions. Chronic pain is an experience, which has an impact on various levels including emotional distress, coping style, behavior and life style in general. Psychiatric co-morbidities and other co-morbidities are extremely important in the proper management of chronic pain. As such, decisions about chronic pain treatment should be purely based on an understanding of the psychiatric co-morbidities associated with chronic pain.
Women suffering from Chronic pelvic pain (CPP) are seen commonly in a pain clinic and many times, pose a major challenge to the treating physician. The unclear etiology, complex symptoms, and poor response to therapy are some of the barriers to provide satisfactory pain relief. Women aged 18-50 years seeking medical consultations for pelvic pain incur approximately $881.5 million per year in the United States.¹

Chronic pelvic pain is defined as pelvic pain occurring for at least 6 months with sufficient intensity to interrupt normal activities of daily life and requiring medical or surgical treatment. Chronic cyclic pelvic pain (CCPP) occurs in relation to the menstrual cycle.²

Not all chronic pelvic pains are cyclical and not all cyclical pelvic pains may be pathological. The cause may arise due to disturbance of many systems, including reproductive, digestive, musculoskeletal, urologic, and neuropsychiatric.

As major chunks of patients suffer from gynaecological causes, they must be ruled out first. Most of the CCPP diseases have an origin in reproductive system disturbance and hormones play a role. Primary dysmenorrhea and Mittelschmerz (ovulation pain) are examples of Physiologic Gynecological cyclic pain. The pain is familiar, short term and managed by simple conservative measures, so these women are rarely seen in pain clinics.

Pathological reproductive system conditions may include:¹

- Endometriosis
- Pelvic inflammatory disease
- Adenomyosis
- Ovarian remnant/residual ovary syndrome
- Fibroid (uterine leiomyoma)
- Cervical stenosis or obstructive abnormality
- Pelvic venous congestion syndrome
- Pelvic adhesions
- Endosalpingiosis

Urinary system conditions include the following:

- Chronic and recurrent urinary tract infections
- Pelvic floor dysfunction
- Urethral diverticula
- Urolithiasis
- Chronic urethral syndrome

GI system conditions include the following:

- Inflammatory bowel disease
- Irritable bowel syndrome
- Colitis
- Chronic constipation
- Diverticular disease
- Chronic intermittent bowel obstruction
Musculoskeletal disorders include the following:
➢ Muscular strains and spasms
➢ Pelvic floor myalgia e.g. levator ani muscle spasm
➢ Piriformis syndrome
➢ Rectus tendonitis
➢ Hernia

Neurologic disorders include the following:
➢ Neuralgia or neuropathy of nerves supplying pelvic structures e.g. Pudendal, ilioinguinal, genitofemoral, iliohypogastric nerves

Table 1 (Linda M. Speer et al). 3
Select Clinical Clues in Women with Chronic Pelvic Pain

<table>
<thead>
<tr>
<th>FINDING</th>
<th>POSSIBLE SIGNIFICANCE</th>
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<tr>
<td>Crampy pain</td>
<td>Inflammatory bowel disease, irritable bowel syndrome</td>
</tr>
<tr>
<td>Hot, burning, or electric shock-like</td>
<td>Nerve entrapment</td>
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<tr>
<td>pain</td>
<td></td>
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<tr>
<td>Pain fluctuates with menstrual</td>
<td>Adenomyosis, endometriosis</td>
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<tr>
<td>cycle</td>
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<tr>
<td>Non-cyclic Pain</td>
<td>Adhesions, interstitial cystitis, irritable bowel syndrome, musculoskeletal</td>
</tr>
<tr>
<td>Pain with urge to void</td>
<td>Interstitial cystitis, urethral syndrome</td>
</tr>
<tr>
<td>Postcoital bleeding</td>
<td>Cervical cancer</td>
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<tr>
<td>Postmenopausal bleeding</td>
<td>Endometrial cancer</td>
</tr>
<tr>
<td>Postmenopausal onset of pain</td>
<td>Malignancy</td>
</tr>
<tr>
<td>Prior abdominal surgery or infection</td>
<td>Adhesions</td>
</tr>
<tr>
<td>Unexplained weight loss</td>
<td>Malignancy, systemic illness</td>
</tr>
</tbody>
</table>

Physical examination

<table>
<thead>
<tr>
<th>FINDING</th>
<th>POSSIBLE SIGNIFICANCE</th>
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<tbody>
<tr>
<td>Adnexal mass</td>
<td>Ovarian neoplasm</td>
</tr>
<tr>
<td>Enlarged or tender uterus</td>
<td>Adenomyosis, chronic endometritis</td>
</tr>
<tr>
<td>FINDING</td>
<td>POSSIBLE SIGNIFICANCE</td>
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</tr>
<tr>
<td>Lack of uterine mobility on bimanual examination</td>
<td>Adhesions, endometriosis</td>
</tr>
<tr>
<td>Pain on palpation of outer back or pelvis</td>
<td>Abdominal/pelvic wall source of pain</td>
</tr>
<tr>
<td>Pelvic floor muscle tenderness</td>
<td>Interstitial cystitis/painful bladder syndrome, piriformis/levator ani syndrome</td>
</tr>
<tr>
<td>Point tenderness of vagina, vulva, or bladder</td>
<td>Adhesions, endometriosis, nerve entrapment</td>
</tr>
<tr>
<td>Positive Carnett sign</td>
<td>Myofascial or abdominal wall source of pain</td>
</tr>
<tr>
<td>Sub-urethral mass, fullness, or tenderness</td>
<td>Urethral diverticulum</td>
</tr>
<tr>
<td>Uterosacral ligament abnormalities</td>
<td>Adenomyosis, endometriosis, malignancy</td>
</tr>
<tr>
<td>Vulvar/vestibular pain</td>
<td>Vulvodynia</td>
</tr>
</tbody>
</table>

### Diagnostic testing

- **Gross or microscopic hematuria**: Severe interstitial cystitis, urinary system malignancy
- **Mass on ultrasonography**: Malignancy

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**Endometriosis:**

It is one of the most common causes of chronic pelvic pain. Endometriosis is defined as the presence of endometrial glands and stroma outside of the endometrial cavity. The patient may complain of dyspareunia, dyschezia, infertility, and menorrhagia. Recurrent attacks may cause pelvic and abdominal adhesions. The pain may be cyclical initially; however, it may become more chronic as the disease progresses. Laparoscopy is advised for confirmation of diagnosis.

**Pelvic Inflammatory Disease (PID):**

This is more common in younger, sexually active women with multiple partners. There is a history of episodes of acute infection. The mechanism of chronic pelvic pain following PID is due to the scarring, pelvic tissue damage, and adhesions resulting. The nerves supplying to the intra-abdominal pelvic organs and musculoskeletal structures can be injured or entrapped. Actions like exercise, sexual intercourse, or passage of food by peristalsis may reproduce pain.
Adenomyosis: 4
Adenomyosis is caused by the presence of endometrial glands and stroma within the myometrium of Uterus. Approximately one fourth of women afflicted by Adenomyosis, present with cyclic pelvic pain and menorrhagia during menstruation. Bleeding and swelling of endometrial islands within myometrium most likely induce pain.

Fibroid (uterine leiomyoma): CCPP may be due to fibroids, frequently accompanied by menorrhagia. As per estimation, 20%-40% women of reproductive age are diagnosed with uterine fibroids. Though irregular uterine bleeding is the most common symptom, cyclical pelvic pain may arise from uterine contraction, ischemia, and heavy menstrual flow. Fibroids arising anteriorly may cause discomfort and pain during intercourse.

Ovarian remnant and residual ovary syndrome: Residual ovary syndrome occurs in cases where ovaries were intentionally preserved or accidently left behind partially (an ovarian remnant) at the time of surgery. Patients complain of recurrent pelvic pain exacerbated by menses.

Pelvic venous congestion syndrome: Pelvic venous congestion refers to a condition in which the patient complains vague pelvic pain, dyspareunia, and exacerbation of pain after prolonged periods of standing occurs. Imaging investigations may reveal pelvic varicosities causing reduced blood flow.

Noncyclical Chronic Pelvic Pain
Gynaecological causes:
Conditions like chronic PID, endosalpingiosis and Pelvic adhesions will cause more persistent chronic, non-cyclical pain. However, the pain may be exacerbated during menstruation. Ovarian cysts are believed to give rise to uni or bilateral pain. But when the cysts have haemorrhage, torsion or rupture patient will complain of severe acute on chronic pain. These conditions do not respond to hormonal treatments.

Pelvic adhesions can be the result of previous surgery, PID, endometriosis, or IVF procedures. The cause of the pain in the presence of adhesions is not very clear. Endosalpingiosis is diagnosed when ciliated tubal epithelium is found outside of the fallopian tubes. Symptomatic pain management and supportive care are more practical than surgical treatments.

Inflammatory bowel Disease (IBD):
Patients with inflammatory bowel disease present with any or all symptoms of intermittent abdominal/Pelvic cramps, fatigue, weight loss, rectal bleeding, bloating, urgency, diarrhea, and constipation. Genetic and disturbance of the immune system are thought to be responsible for IBD. Ulcerative colitis and Crohn’s disease fall under IBD.

Irritable bowel syndrome is not a disease, but rather a condition that affects the function and behavior of the intestines. Symptoms of IBS can include abdominal/pelvic cramps, pain, bloating, gas, mucus in the stool, diarrhea and/or constipation. The exact cause of IBS is unknown. The hypersensitivity of the GI tract to gas and bloating, alteration of the fecal bacterial flora, altered levels of serotonin are among possible causative conditions for IBS.

Interstitial cystitis (IC):
Interstitial cystitis is a non-infectious chronic inflammatory condition of the bladder. Women suffering from IC can present with symptoms like frequency, dysuria, urgency, nocturia, and chronic pelvic pain. The pain can exacerbate during the menstrual cycle and/or intercourse.

Musculoskeletal Causes of Chronic pelvic pain: 5,6 Pelvic floor myalgia is usually associated with involuntary spasm of the pelvic floor muscles. This pain can be described as aching, feeling of heaviness, or burning. It is not cyclical, but the pain may be exacerbated during menses.

The causes of chronic pelvic pain are multiple and can be cyclical or non-cyclical. It needs proper assessment and evaluation of the patient to arrive at the diagnosis and employ corrective measures.

References:


Pain physicians need to understand diagnostic and treatment strategies for common causes of shoulder pain. We should review key elements of the history and physical examination and describe maneuvers that can be used to reach an appropriate diagnosis. Examination of the shoulder should include inspection, palpation, evaluation of range of motion and provocative testing. In addition, a thorough sensorimotor examination of the upper extremity should be performed, and the neck and elbow should be evaluated.

Shoulder pain is a common complaint in pain practice patients. The unique anatomy and range of motion of the glenohumeral joint can present a diagnostic challenge, but a proper clinical evaluation usually discloses the cause of the pain.

Anatomy

The shoulder is composed of the humerus, glenoid, scapula, acromion, clavicle and surrounding soft tissue structures. The shoulder region includes the glenohumeral joint, the acromioclavicular joint, the sternoclavicular joint and the scapulothoracic articulation (Figure 1a). The glenohumeral joint capsule consists of a fibrous capsule, ligaments and the glenoid labrum. Because of its lack of bony stability, the glenohumeral joint is the most commonly dislocated major joint in the body. Glenohumeral stability is due to a combination of ligamentous and capsular constraints, surrounding musculature and the glenoid labrum. Static joint stability is provided by the joint surfaces and the capsulolabral complex, and dynamic stability by the rotator cuff muscles and the scapular rotators (trapezius, serratus anterior, rhomboids and levator scapulae).

Figure 1a / Anatomy of Shoulder Girdle

The rotator cuff is composed of four muscles: the supraspinatus, infraspinatus, teres minor and subscapularis (Figure 1b). The subscapularis facilitates internal rotation, and the infraspinatus and teres minor muscles assist in external rotation. The rotator cuff muscles depress the humeral head against the glenoid. With a poorly functioning (torn) rotator cuff, the humeral head can migrate upward within the joint because of an opposed action of the deltoid muscle.
Scapular stability collectively involves the trapezius, serratus anterior and rhomboid muscles. The levator scapular and upper trapezius muscles support posture; the trapezius and the serratus anterior muscles help rotate the scapula upward, and the trapezius and the rhomboids aid scapular retraction.

History
A complete history begins with the patient's age, dominant hand and sport or work activity. It is important to assess whether the injury prevents or hampers normal work activities, hobbies and sports. The patient should be asked about shoulder pain, instability, stiffness, locking, catching and swelling. Stiffness or loss of motion may be the major symptom in patients with adhesive capsulitis (frozen shoulder), dislocation or glenohumeral joint arthritis. Pain with throwing (such as pitching a baseball) suggests anterior glenohumeral instability. Patients who complain of generalized joint laxity often have multidirectional glenohumeral instability.

Distinguishing between an acute and a chronic problem is diagnostically helpful

| Scapular winging, trauma, recent viral illness | Serratus anterior or trapezius dysfunction |
| Seizure and inability to passively or actively rotate affected arm externally | Posterior shoulder dislocation |
| Supraspinatus/infraspinatus wasting | Rotator cuff tear; suprascapular nerve entrapment |
| Pain radiating below elbow; decreased cervical range of motion | Cervical disc disease |
| Shoulder pain in throwing athletes; anterior glenohumeral joint pain and impingement | Glenohumeral joint instability |
| Pain or “clunking” sound with overhead motion | Labral disorder |
| Nighttime shoulder pain | Impingement |
| Generalized ligamentous laxity | Multidirectional instability |

For example, a history of acute trauma to the shoulder with the arm abducted and externally rotated strongly suggests shoulder subluxation or dislocation and possible glenoid labral injury. In contrast, chronic pain and loss of passive range of motion suggest frozen shoulder or tears of the rotator cuff.
Once the location, quality, radiation, and aggravating and relieving factors of the shoulder pain have been established, the possibility of referred pain should be excluded. Neck pain and pain that radiates below the elbow are often subtle signs of a cervical spine disorder that is mistaken for a shoulder problem.

The patient should be asked about paresthesias and muscle weakness. Pneumonia, cardiac ischemia and peptic ulcer disease can present with shoulder pain. A history of malignancy raises the possibility of metastatic disease. The patient should be asked about previous corticosteroid injections, particularly in the setting of osteopenia or rotator cuff tendon atrophy.

Physical Examination

A complete physical examination includes inspection and palpation, assessment of range of motion and strength, and provocative shoulder testing for possible impingement syndrome and glenohumeral instability. The neck and the elbow should also be examined to exclude the possibility that the shoulder pain is referred from a pathologic condition in either of these regions.

INSPECTION

The physical examination includes observing the way the patient moves and carries the shoulder. The patient should be properly disrobed to permit complete inspection of both shoulders. Swelling, asymmetry, muscle atrophy, scars, ecchymosis and any venous distention should be noted. Deformity, such as squaring of the shoulder that occurs with anterior dislocation, can immediately suggest a diagnosis. Scapular “winging,” which can be associated with shoulder instability and serratus anterior or trapezius dysfunction, should be noted. Atrophy of the supraspinatus or infraspinatus should prompt a further work-up for such conditions as rotator cuff tear, suprascapular nerve entrapment or neuropathy.

PALPATION

Palpation should include examination of the acromioclavicular and sternoclavicular joints, the cervical spine and the biceps tendon. The anterior glenohumeral joint, coracoid process, acromion and scapula should also be palpated for any tenderness and deformity.

RANGE-OF-MOTION TESTING

Because the complex series of articulations of the shoulder allows a wide range of motion, the affected extremity should be compared with the unaffected side to determine the patient’s normal range. Active and passive ranges should be assessed. For example, a patient with loss of active motion alone is more likely to have weakness of the affected muscles than joint disease.

Shoulder abduction involves the glenohumeral joint and the scapulothoracic articulation. Glenohumeral motion can be isolated by holding the patient’s scapula with one hand while the patient abducts the arm. The first 20 to 30 degrees of abduction should not require scapulothoracic motion. With the arm internally rotated (palm down), abduction continues to 120 degrees. Beyond 120 degrees, full abduction is possible.
only when the humerus is externally rotated (palm up).

The Apley scratch test is another useful maneuver to assess shoulder range of motion (Figure 2). In this test, abduction and external rotation are measured by having the patient reach behind the head and touch the superior aspect of the opposite scapula. Conversely, internal rotation and adduction of the shoulder are tested by having the patient reach behind the back and touch the inferior aspect of the opposite scapula. External rotation should be measured with the patient’s arms at the side and elbows flexed to 90 degrees.

Figure 2 / Apley scratch test. The patient attempts to touch the opposite scapula to test range of motion of the shoulder. (Left) Testing abduction and external rotation. (Right) Testing adduction and internal rotation.

EVALUATING THE ROTATOR CUFF

In evaluating the rotator cuff, the patient’s affected extremity should always be compared with the unaffected side to detect subtle differences in strength and motion. A key finding, particularly with rotator cuff problems, is pain accompanied by weakness. True weakness should be distinguished from weakness that is due to pain. A patient with subacromial bursitis with a tear of the rotator cuff often has objective rotator cuff weakness caused by pain when the arm is positioned in the arc of impingement. Conversely, the patient will have normal strength if the arm is not tested in abduction.

The supraspinatus can be tested by having the patient abduct the shoulders to 90 degrees in forward flexion with the thumbs pointing downward. The patient then attempts to elevate the arms against examiner resistance (Figure 3). This is often referred to as the “empty can” test.

Figure 3 / Supraspinatus examination (“empty can” test). The patient attempts to elevate the arms against resistance while the elbows are extended, the arms are abducted and the thumbs are pointing downward.

Next, with the patient’s arms at the sides, the patient flexes both elbows to 90 degrees while the examiner provides resistance against external rotation (Figure 4). This maneuver is used to evaluate the function of the infraspinatus and teres minor muscles, which are mainly responsible for external rotation.

Figure 4 / Infraspinatus/teres minor examination. The patient attempts to externally rotate the arms against resistance while the arms are at the sides and the elbows are flexed to 90 degrees.

Subscapularis function is assessed with the lift-off test. The patient rests the dorsum of the hand on the back in the lumbar area. Inability to move the hand off the back by further internal rotation of the arm suggests
injury to the subscapularis muscle. In one study, the investigators noted that only a few of the patients with confirmed subscapularis ruptures actually demonstrated a positive result on the lift-off test; the remainder could not complete the test because of pain.

A modified version of the lift-off test is useful in a patient who cannot place the hand behind the back. In this version, the patient places the hand of the affected arm on the abdomen and resists the examiner’s attempts to externally rotate the arm.

Provocative Testing

Provocative tests provide a more focused evaluation for specific problems and are typically performed after the history and general examination have been completed.

<table>
<thead>
<tr>
<th>TEST</th>
<th>MANEUVER</th>
<th>DIAGNOSIS SUGGESTED BY POSITIVE RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apley scratch test</td>
<td>Patient touches superior and inferior aspects of opposite scapula</td>
<td>Loss of range of motion: rotator cuff problem</td>
</tr>
<tr>
<td>Neer's sign</td>
<td>Arm in full flexion</td>
<td>Subacromial impingement</td>
</tr>
<tr>
<td>Hawkins' test</td>
<td>Forward flexion of the shoulder to 90 degrees and internal rotation</td>
<td>Supraspinatus tendon impingement</td>
</tr>
<tr>
<td>Drop-arm test</td>
<td>Arm lowered slowly to waist</td>
<td>Rotator cuff tear</td>
</tr>
<tr>
<td>Cross-arm test</td>
<td>Forward elevation to 90 degrees and active adduction</td>
<td>Acromioclavicular joint arthritis</td>
</tr>
<tr>
<td>Spurling’s test</td>
<td>Spine extended with head rotated to affected shoulder while axially loaded</td>
<td>Cervical nerve root disorder</td>
</tr>
<tr>
<td>Apprehension test</td>
<td>Anterior pressure on the humerus with external rotation</td>
<td>Anterior glenohumeral instability</td>
</tr>
<tr>
<td>Relocation test</td>
<td>Posterior force on humerus while externally rotating the arm</td>
<td>Anterior glenohumeral instability</td>
</tr>
<tr>
<td>Sulcus sign</td>
<td>Pulling downward on elbow or wrist</td>
<td>Inferior glenohumeral instability</td>
</tr>
<tr>
<td>Yergason test</td>
<td>Elbow flexed to 90 degrees with forearm pronated</td>
<td>Biceps tendon instability or tendonitis</td>
</tr>
<tr>
<td>Speed’s maneuver</td>
<td>Elbow flexed 20 to 30 degrees and forearm supinated</td>
<td>Biceps tendon instability or tendonitis</td>
</tr>
<tr>
<td>TEST</td>
<td>MANEUVER</td>
<td>DIAGNOSIS SUGGESTED BY POSITIVE RESULT</td>
</tr>
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</tr>
<tr>
<td>“Clunk” sign</td>
<td>Rotation of loaded shoulder from extension to forward flexion</td>
<td>Labral disorder</td>
</tr>
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</table>

Suprascapular Nerve block either fluoroscopy or USG guided, USG guided LA or steroid injection or radiofrequency ablation is to performed as a pain physician. But primary job to rule out red flags and reach at a diagnosis following the proper test protocols.

The identification of cancer pain syndrome can help to know the etiology of the pain, helps in diagnostic evaluation, clarify the prognosis for the pain and the disease, and to guide therapeutic intervention.

**Acute Pain Syndromes**

**Acute pain syndromes related to diagnostic interventions**

1. Lumbar puncture
2. Blood sampling
3. Biopsy etc.

**Acute pain syndromes related to therapeutic interventions**

1. Chest tube insertions
2. Percutaneous biliary stents
3. Nephrostomy tube insertion
4. Abdominal paracentesis
5. Vascular embolization etc.

**Acute pain syndromes associated with analgesic techniques**

1. Injection-related
2. Epidural injection
3. Opioid hyperalgesia syndrome

**Acute pain syndromes directly related to cancer**

1. Intratumoral hemorrhage
   - Prototype of this pain → Hepatocellular carcinoma
     - Presentation → severe right upper quadrant pain
     - If tumor ruptures → life threatening complication.
     - Urgent intervention for bleeding control may be required, in addition to pain control and transfusion. Emergency surgery may be needed if transarterial embolization is unsuccessful.

2. Pathologic fractures
   - Skeletal metastasis/Primary bone tumor
   - Sudden onset of back or limb pain, with or without antecedent trauma.
   - Surgical stabilization (if feasible)
   - Vertebral compression fracture → analgesics, vertebroplasty/kyphoplasty, surgery (rarely considered).
   - Radiation therapy is considered for all pathologic fractures.

3. Obstruction or Perforation of a hollow viscus
   - Bile duct, ureter or bowel lumen by mass/ fibrosis
   - Percutaneous decompression, stenting, or occasional surgery is needed.

4. Superior vena cava obstruction
   - Primary/ metastatic tumors
   - Dyspnea, facial and neck swelling, and dilated neck and chest wall veins.
   - T/t → vascular stenting or radiation therapy
5. Pain due to acute thrombosis
   - Cancer → Prothrombotic state
   - DVT → common complication
   - Pain and swelling suggest the diagnosis

**Acute pain syndromes related to antineoplastic treatments**

**A. Related to chemotherapy toxicity**

1. Oral mucositis
   - The mucosa throughout entire gastrointestinal tract may get affected.
   - Pain usually results from oral mucositis, which becomes clinically evident during the first week after administration of chemotherapy.
   - Incidence varies with the drugs used and dose, the use of concurrent radiotherapy (RT), and host factors.
   - The most commonly used chemotherapy agents associated with oral mucositis are doxorubicin, fluorouracil (FU), and methotrexate etc.
   - RT-induced mucositis is qualitatively same as induced by chemotherapy which usually develops two to three weeks after starting treatment.

2. Chemotherapy-induced neuropathy
   - Acute neuropathic pain manifest as a polyneuropathy, or less commonly, a mononeuropathy.
   - Associated with agents like vincristine, cisplatin, paclitaxel, oxaliplatin, thalidomide, bortezomib etc.
   - Although they can present acutely (eg, oxaliplatin-induced pharyngolaryngeal spasm), the onset of pain associated with neuropathy in patients treated with these agents is more often insidious.
   - Chemotherapy-induced neuropathic pain usually gradually improves after the treatment is stopped or the dose is reduced; occasionally, neuropathic pain becomes chronic.
   - Rare overall, acute chemotherapy-related mononeuropathy is best described with vincristine. Orofacial pain (particularly jaw pain) is the most common manifestation, with multiple sites affected in the distribution of the trigeminal and glossopharyngeal nerves.

3. Arthralgias, Myalgias and bone pain
   - Painful rash on the palms and soles after the chemotherapy administration.
   - Common agents implicated are cytarabine, capecitabine, 5-fluourouracil, vinorelbine, docetaxel.

4. Headaches (e.g., due to intrathecal methotrexate meningitis syndrome, l-asparaginase-associated dural sinus thrombosis, all trans-retinoic acid [ATRA]-related headache)

5. Arthralgias and myalgias

6. Palmar-plantar erythrodysesthesia syndrome (hand-foot syndrome)
   - rapid intravenous administration of a glucocorticoid, particularly dexamethasone.
   - Self-limiting, reassurance required.

7. Post-chemotherapy acute limb ischemia
8. Fluoropyrimidine-induced angina
9. Post-chemotherapy gynecomastia
10. Steroid-induced perineal burning
11. ATRA-induced diffuse bone pain

**B. Related to chemotherapy infusion techniques**

1. Intravenous infusion pain (e.g., oxaliplatin)
2. Venous spasm
3. Chemical phlebitis (vinorelbine, 5-fluorouracil)
4. Viscant extravasation
5. Anthracycline-associated localized skin flare reaction at or adjacent to drug administration site
6. Hepatic artery infusion pain
7. Abdominal pain associated with intraperitoneal chemotherapy
8. Pain associated with intravesical instillation of chemotherapy

**Acute pain syndromes associated with radiotherapy:**
1. Incident pain associated with positioning
2. Oropharyngeal mucositis
3. Early onset brachial plexopathy
   - Acute, transient brachial plexopathy can occur after RT
   - Pain, paresthesias, and weakness in the shoulder, arm, and hand.
   - Usually self-limited.
4. Acute radiation enteritis or proctitis
   - Cramping, nausea and vomiting (radiation enteritis)
   - Painful tenesmus with diarrhoea, mucus discharge and bleeding (radiation proctitis)
   - Specific factors that increase the risk for RT-related bowel toxicity include older age, concomitant chemotherapy, and at least in the setting of rectal cancer, the use of postoperative rather than preoperative RT.
5. Acute vertebral bone pain after radiation
6. Acute and subacute radiation myelopathy

**Chronic Pain Syndromes**
Approximately three-fourths of cancer patients who have chronic pain have nociceptive (somatic and visceral) or neuropathic syndromes that represent direct effects of the neoplasm.

**Chronic pain syndromes directly related to cancer**

**Tumor related somatic pain syndromes**

1. **Multifocal bone pain**
   A. Bone metastases
   - Most prevalent case of chronic pain in cancer patients.
   - Lung, breast and prostate cancers are most commonly associated.
   - There may be direct invasion, secondary pathologic fracture, or damage to nearby structures.
   - Local field external beam RT is a well-recognized and effective palliative modality for painful bone metastases; pain relief is seen in 80 to 90 percent of cases.

2. **Vertebral pain syndromes**
   - Spine → commonest site of bone metastases. Referred pain syndromes are common, usually presenting below the site of metastasis.
   - Lesions affecting the odontoid refer to the base of the neck, C7 or T1 vertebra refer pain to the interscapular region, and those of T12 or L1 refer pain to the iliac crest or region of the greater trochanter.
   - Early recognition facilitates prompt treatment of the pain and underlying bone disease, and potentially averts spinal cord or cauda equina compression at the site of a vertebral metastasis.
   - **Neoplastic epidural spinal cord compression (ESCC)**
   - Pain and usually irreversible loss of neurologic function.
   - RT - 1st line definitive treatment
   - Steroid therapy → temporary measure for analgesia and to improve neurological function.
   - Surgical decompression → radioresistant tumors/high grade tumors

3. **Pelvic and hip metastasis**
   - Ilium, ischium, pubis, or sacroiliac areas
   - T/t → RT, Interventional strategies(some cases)

4. **Malignant piriformis syndrome**
   - Pain in the buttock and/or sciatic distribution, often with exacerbation during internal rotation of the hip or a painful plexopathy.
6. Sacral Syndrome
• Tumor-related injury of the sacrum and presacral tissues
• Pain radiating to buttocks, posterior thighs, or perineum

7. Base of skull metastases
• Orbital syndrome
  ✓ retroorbital pain, proptosis, diplopia, visual distortion, and chemosis of the involved eye, ophthalmoparesis, and ipsilateral papilledema
• Parasellar syndrome
  ✓ retroorbital and frontal pain associated with ophthalmoparesis with diplopia.
• Middle cranial fossa syndrome
  ✓ malar or jaw pain
• Jugular foramen syndrome
  ✓ pain in the ipsilateral ear, neck, or shoulder
• Occipital condyle syndrome
  ✓ unilateral occipital pain, neck stiffness, and head tilt, possibly associated with unilateral tongue atrophy
• Clivus syndrome
  ✓ vertex headache, which is worsened by neck flexion.

8. Tumor-related soft tissue pain
• Headache and facial pain
• Ear and eye pain syndromes
• Pleural pain

9. Paraneoplastic pain syndromes
• Muscle cramps
• Hypertrophic osteoarthropathy
• Tumor-related gynecomastia (eg, in testicular neoplasms that secrete human chorionic gonadotropin)
• Paraneoplastic pemphigus
• Paraneoplastic Raynaud phenomenon

Tumor related visceral pain syndromes

1. Hepatic distention syndrome
• Pain-sensitive structures in the region of the liver include the hepatic capsule, vessels, and biliary tract.
• Dull, right sided subcostal pain.
  If the superior aspect of the capsule is involved, diaphragmatic irritation may lead to referred pain to the top of the ipsilateral shoulder.

2. Midline retroperitoneal syndrome
• Injury of celiac plexus / injury of deep somatic tissues of posterior abdominal wall by tumor invasion of pancreas and subdiaphragmatic midline structures.
• Pain in epigastric region, low thoracic region or back.

3. Chronic intestinal obstruction
• Diffuse abdominal pain
• The common cancers that cause intestinal obstruction are ovarian and colorectal.
• Distension proximal to an obstructed segment, mural ischemia, or tension on the mesentery leads to pain.
• Nausea, vomiting and constipation are important associated symptoms.
Abdominal radiographs taken in both the supine and upright positions may demonstrate the presence of air-fluid levels and intestinal distention.
CT or MRI usually reveals the extent of the intraabdominal neoplasm.

4. Peritoneal carcinomatosis
- Peritoneal inflammation, mesenteric tethering, malignant adhesions, and ascites.
- Cancers of the ovary, colorectum and stomach are frequent causes of this syndrome.

5. Malignant perineal pain
- Most often associated with tumors of the colon or rectum, female reproductive tract, and distal genitourinary system.

6. Adrenal Pain syndrome
- Most common in non-small cell lung carcinoma.

7. Ureteric obstruction
- Gastrointestinal, genitourinary and gynaecological cancers are the most common causes of ureteral obstruction.
- Pain is often colicky, i.e., intermittent and wave-like.

Tumor-related neuropathic pain syndromes

1. Cranial neuralgias
   A. Glossopharyngeal neuralgia
      - Pain in the throat or neck which may radiate to the ear and mastoid regions.
      - Triggers include swallowing, coughing, chewing, speaking etc.
   B. Trigeminal neuralgia
      - Tumors of middle or posterior cranial fossa
      - Imaging of both the brain and skull base may be necessary to characterize or exclude a mass lesion as the cause of the pain and associated features.

2. Leptomeningeal metastases
- Common tumors are lung and breast cancer, lymphoma and leukemia.
- Clinical presentation is variable.
- Headache/ nonspecific back pain/ cognitive impairment.
- Lumbar puncture / MRI

3. Radiculopathies
- Cervical
- Thoracis
- Lumbosacral

4. Plexopathies
   A. Cervical plexopathy
   B. Brachial plexopathy
   - Local extension of a primary or metastatic tumor, cancers of breast, and lymphomas are the most common etiology.
   - Neoplastic / Radiation induced
   - MRI/ CT Scan
   C. Lumbosacral plexopathy
   - Colorectal, cervical and breast cancers, sarcomas, lymphomas and sacral chordomas.

5. Painful peripheral mononeuropathies
- Direct tumor invasion of a peripheral nerve.
- E.g., Malignant intercostal neuropathy complicating a chest wall tumor.
6. Paraneoplastic sensory neuropathy
   - Caused by substance released by tumor or produced in reaction to it. E.g., hormones or other compounds, including antibodies or other compounds produced through immune responses.

**Tumor-treatment related cancer pain syndromes**

1. **Chemotherapy-related pain syndromes**
   - Bony complications of long-term corticosteroids
     - Chronic use of glucocorticoids may cause avascular necrosis of the humeral or femoral head ➔ Painful arthropathy
     - MRI/CT findings may not appear for a few months after the initial report of pain.
   - Avascular necrosis
     - Vertebral compression fractures
     - Carpal tunnel syndrome
   - Chemotherapy-induced peripheral neuropathy
   - Raynaud’s syndrome

2. **Hormone therapy-related pain syndromes**
   - Arthralgias and myalgias
   - Gynecomastia
   - Painful gynecomastia develops in men receiving therapy for antiandrogens alone for advanced prostate cancer unless prophylactic radiotherapy is administered.
   - Osteoporotic compression fractures

3. **Radiotherapy-related pain syndromes**
   - Enteritis and proctitis
   - Cystitis
   - Formation of fistula
   - Lymphedema
     - RT to the breast or shoulder or to the pelvis.
     - Approximately 1/3 of cancer patients with lymphedema experience pain and tightness.
     - New onset or progressive pain in a lymphedematous limb ➔ tumor recurrence infection, or a secondary malignancy (e.g., Stewart-Treves syndrome) and requires reevaluation.
   - Myelopathy
     - Late complication which may develop many years following the completion of RT.
     - Sensory symptoms, including pain, typically precede the development of progressive motor and autonomic dysfunction.
     - The pain is usually characterized as a burning dysesthesia and is localized to the area of spinal cord damage or below this region.
   - Osteoporosis
   - Osteoradionecrosis and fractures
   - Painful secondary malignancies
   - Peripheral mononeuropathies
   - Plexopathies
     - Radiation-induced cervical, brachial or lumbosacral plexopathies may occur months to many years after RT.
     - Weakness and sensory changes.
     - Chronic perineal pain following pelvic RT is often clinically associated with a sacral plexopathy. The pain is burning in nature and may extend anteriorly to the vagina or scrotum.

**Surgery-related pain syndromes**

- Lymphedema
- Postamputation phantom pain
  - Stump pain
 ✓ Phantom pain
 ✓ Both
 ✓ Phantom sensation, the sensory experience that the amputated limb is still present, occurs in most amputees.

- Post-mastectomy pain syndrome
- Post-radical neck dissection pain
- Post-surgery pelvic floor pain
- Post-thoracotomy pain/frozen shoulder
- Post-surgery extremity pain (e.g., sarcoma)

**Management of cancer pain syndromes**
- Thorough Assessment
- Analgesics according to WHO ladder of pain
- Evaluate and treat psychosocial and spiritual aspects of pain
- Interventions – Epidural steroid injections, vertebroplasty/kyphoplasty, coeliac plexus block etc.
- Radiotherapy – SVC obstruction, Bone metastasis, Neoplastic epidural cord spinal cord compression etc.

**SUMMARY**
- A cancer pain syndrome is defined as a clinically meaningful constellation of symptoms and signs in a patient with cancer.
- Cancer pain syndromes may be broadly classified into acute and chronic.
- Acute pain syndromes are mainly diagnostic or therapeutic interventions. Few are directly related to the malignancy itself (e.g., hemorrhage into a hepatocellular cancer, pathologic fracture, obstruction or perforation of a bile duct, ureter, or bowel lumen).
- Chronic pain syndromes are usually directly related to the tumor itself or to an anticancer therapy (including chemotherapy, surgery, or radiation therapy).
Continuous spinal anesthesia is the technique of producing and maintaining spinal anesthesia using low volumes of local anesthetics which are intermittently injected into the sub arachnoid space via an indwelling catheter. Despite single shot spinal anesthesia being the main workhorse of an every day anesthesiologist, continuous spinal catheters in anesthesia and acute pain medicine are certainly not popular.

The concept of continuous spinal anesthesia has been around since 1907, when a British surgeon described the insertion of a needle into the sub arachnoid space and leaving it there so that repeat doses of local anesthetic could be administered. With the advent of microcatheters in the 1990s, there was a resurgence in the practice. However, there was a rapid fall in popularity after reports of cauda equina syndrome with the use of microcatheters surfaced. This was later disproved and the blame fell squarely on the local anesthetic solutions that were used.

When correctly practiced, continuous spinal anesthesia is perhaps the most hemodynamically stable anesthetic technique available. Contrary to the belief that catheter techniques are used to prolong the block infinitely, the key to masterly usage of the sub arachnoid catheter is in patients who are susceptible to the hemodynamic swings of conventional techniques.

Today, there are various catheter designs available for the procedure. Catheters are available in various gauges and the kits either incorporate a ‘catheter through needle’ or a ‘catheter over needle’ design, each of which has its own advantage.

With careful selection, continuous spinal anesthesia adds an additional dimension in the anesthesiologist’s armamentarium.
An intrathecal drug pump delivers medicine directly into the cerebrospinal fluid and hence works more efficiently than oral medication. Generally only a fraction of the oral dose is needed with the pump for the clinical benefit.

The pump is a metallic inch thick round device shaped like a hockey puck about 2 to 3 inches in diameter. It is a round metal device about the size of a hockey puck that is surgically implanted beneath the skin of the abdomen. It is connected to a narrow tube which is tunneled under the skin into the back where it is inserted into the spinal cerebrospinal fluid space, using a wide bore needle. The pump is battery operated, programmable and has a reservoir which can usually hold 40ml of the drug for continuous infusion as programmed.

The procedure has two parts.

1) Placement of the tube in the back into the spinal fluid space.
2) Connecting the tube to the pump which is implanted in the abdominal wall.

Step 1: Patient preparation
It is generally performed under full anaesthesia, with the patient positioned on the side, giving access to both the back and front of the abdomen. The surgical areas are sterile prepared and draped accordingly.

Step 2: Placing the tube
Through a small skin nick, a wide bored needle is placed in the spinal fluid filled space and the tube guided into it.

Step 3: Bringing the tube towards the abdomen. The tube is tunnelled across to the front of the abdomen under the skin. A connecting tube is placed to facilitate connection to the pump.

Step 4: Implanting the pump
A slightly larger the size of the pump incision is made to one side of the abdomen, and a sub cutaneous pocket is made under the skin. The pump is placed in the pocket made and connected to the spinal tube using the connecting tube pump is then anchored to the undelying tissue.

Step 5: Closing the wounds
Sutures are placed and the incisions closed after checking that the connections are sound and the tube and pump are anchored well to avoid any displacement.

The programming is done immediately to facilitate infusion of the drug. It is further titrated as per need/response.
Knee joint is the most common problem joint, with most common problems being pain, instability, locking and swelling. Knee pain is often difficult to diagnose due to complexity of joint and associated structures. To simplify, knee pain can be classified according to intensity and chronicity of trauma and further divided based on location into anterior, medial, lateral and posterior knee pain.

Anterior knee pain may be due to knee osteoarthritis, patellofemoral pain syndrome, patellar dislocation/ subluxation, supra/ pre/ infra-patellar bursitis, patellar tendinopathy, Osgood schlatter’s disease, hoffa fat pad syndrome, etc. Lateral knee pain due to Lateral meniscal injury, Lateral collateral ligament injury, iliotibial band syndrome, knee OA. Medial knee pain can be caused by knee OA, medial meniscal injury, medial collateral ligament injury, pes anserine bursitis. Lastly, posterior knee pain may have causative condition like popliteal cyst, knee OA, popliteus tendinopathy, popliteal artery aneurysm. Knee pain may be referred from hip eg. slipped capital femoral epiphysis. Perthe’s disease. Systemic conditions leading to knee pain may be pseudogout, gout, rheumatoid arthritis, psoriatic arthritis, neuropathic arthropathy, hemophilic arthropathy. There are various treatment modalities ranging from conservative measures like cold compression, exercises, ESWT, guided physiotherapy to surgery (open/ arthroscopic). Minimally invasive approaches practised by pain physicians like injectional therapy, regenerative therapy, radiofrequency ablation, etc bridging the gap between conservative and surgical approaches with promising outcomes.
Introduction:

Chronic pain poses a tremendous burden to patients, their families, the economy, and society as a whole. The nature of their problem makes chronic pain patients notoriously difficult to evaluate and treat. To be truly effective, chronic pain treatment should address not only the physical cause of the pain but its emotional, behavioral and social implications. One particularly flexible and effective model of treatment, interdisciplinary pain rehabilitation, has been developed in response to this challenge. Why does a patient continue to complain of pain after a well-performed block or operation targeting a well-defined anatomic lesion? Why does potent pharmacotherapy often fail to control the pain? The answers are complex. Single treatments may address a particular area of damage or disease but may not treat the deconditioning, muscular contracture and postural alterations that develop after months or years of chronic discomfort and which may become painful themselves. Psychosocial variables, including affective disorders, altered social roles, learned “sick-role” behavior and compensation issues may also complicate the resolution of chronic pain syndrome. Since chronic pain affects the entire person, treatment should logically employ a holistic approach. The pain rehabilitation model brings this whole-person perspective to chronic pain therapy. The true pioneer of pain rehabilitation, however, was John J. Bonica, whose development of multidisciplinary pain centers in the late 1960s and 1970s revolutionized pain treatment.

Rehabilitation medicine differs from other types of medical practice in a number of ways. A major focus is on preserving residual function and preventing secondary complications (physical, physiological, behavioral, or social) that lead to increased disability. Rehabilitation is geared to the needs of people with multifaceted problems and, therefore, tends to take a multidisciplinary approach to treatment in which experts from a number of pertinent disciplines work together to design and implement treatment plans. But the key factor of rehabilitation principle is to make the patient understand about its usefulness. Patients often appear unmotivated for rehabilitation, and "poor motivation" is frequently the reason given for excluding them from rehabilitation programs. However, these patients may actually be impeded by specific obstacles to the development of motivation. Appropriate intervention may enable them to make better use of rehabilitation opportunities.

What is Motivation?

Resnick and his associates describe motivation as an inner urge, which moves or prompts a person to action and Guthrie & Harvey (1994) suggest that a motivated patient is often described as "willing to expend effort, not needing undue encouragement and tending not to complain about the rigours of treatment". However, Maclean & Pound (2000) caution that seeing motivation as a purely internal quality of the individual patient, may lead to moralising on behalf of health care staff; judging the patient as somehow lacking. Indeed, Geelen & Soons (1996) suggest that motivation is more to do with “the way in which a patient experiences or interprets their own efforts/ the subjective perception and evaluation of one’s own chances of successful rehabilitation” and is affected by all sorts of social or external factors. This suggests that there are factors that can positively or negatively affect a person’s motivation and, therefore, may indicate strategies to enhance motivation.

Strategies to Enhance Motivation

In order to assist a person in enhancing their motivation, Kemp (1988) and Resnick (1991) recommend that in general, a motivational framework must be considered and competing motive systems need to be understood. It should be clear whose motives are being considered, the patient’s or the professional’s,
and the focus should be on the individual. More specifically, Kemp (1988) suggests that health care professional should, in keeping with the motive equation:

- Explore what the patient wants and why they want it, and assist in the establishment of attainable goals
- Explore the patient’s beliefs about the situation, themselves and the future
- Find out what is important, offering rewards frequently, especially early on, in order to sustain behaviour
- Reduce undesired costs by encouraging patients to verbalise their fears and anxieties and by explaining to patients, what may realistically be expected.

Similarly, Geelen & Soons (1996) suggest further strategies that the health care professional should implement in order to enhance patient motivation. They suggest that the professional should:

- Know how the patient perceives the situation
- Be alert to potential motivational problems
- Tune into the patient’s needs for information and education
- Be aware that the patient may not be able to take in information
- Set short-term, achievable goals
- Make the patient an active partner in rehabilitation
- Be aware of their concerns
- Look out for hidden costs and make them less emotionally demanding

Conclusion

An understanding of concepts of motivation appears to be central to supporting patients through the rehabilitation process, and professionals need to be aware of the potential impact on patients of their own views of motivation. Labeling patients who fail to engage in a rehabilitation programme as lazy or apathetic is unhelpful and fails to recognise the role that professionals play in supporting patients through what is often a long, painful and difficult process. Assessing individuals subjectively and identifying those with proactive demeanors as most likely to display motivation, may disadvantage those quieter, more passive or non-active patients who may, nevertheless, still be willing to engage and participate in their own rehabilitation.

References:
Introduction

International Association for the Study of Pain describes Neuropathic Pain as "pain caused by a lesion or disease of the somatosensory system." and includes various chronic conditions that, together, affect up to 8% of the population. A substantial body of neuropathic pain research points to several important contributory mechanisms including aberrant ectopic activity in nociceptive nerves, peripheral and central sensitization, impaired inhibitory modulation, and pathological activation of microglia. Clinical evaluation of neuropathic pain requires a thorough history and physical examination to identify characteristic signs and symptoms. In many cases, other laboratory investigations and clinical neurophysiological testing may help identify the underlying etiology and guide treatment selection.

Characters of Neuropathic Pain

The "positive" symptoms of neuropathic pain conditions include both stimulus-independent ("spontaneous") and stimulus-dependent ("evoked") pain and other symptoms such as tingling (i.e., paresthesias). The "negative" signs and symptoms that may be observed include numbness, weakness, and loss of deep tendon reflexes in the involved nerve territory. The Neuropathic pain can follow different temporal profiles (e.g., continuous vs intermittent) and may be described with different pain quality descriptors. Stimulus evoked pain includes allodynia, defined as pain in response to a normally nonpainful stimulus (e.g., contact of clothing on skin), and hyperalgesia, defined as increased pain in response to a normally painful stimulus.

NeuPSIG Guidelines for assessment of Neuropathic Pain

The objectives of this is to:

1. Assess the incidence and prevalence of neuropathic-type pain in the population
2. Evaluate the sensitivity of the various methods for assessing patients with neuropathic pain
3. Evaluate the methods in assessing standard treatments
4. Propose, where required, new studies that may help to clarify unsolved issues.

GRADING SYSTEM for assessment of Neuropathic pain has divided that as having Possible, Probable or Definite Neuropathic pain depending on the level of assessment.
**Possible Neuropathic pain**

- Primarily Based on verbal pain description with, or without, limited clinical examination
- The Leeds assessment of neuropathic symptoms and signs (LANSS) contains 5 symptom items and 2 clinical examination items
- The neuropathic pain questionnaire (NPQ) consists of 12 items that include 10 related to sensations or sensory responses, and 2 related to affect
- Douleur neuropathique en 4 questions (DN4) consists of 7 items related to symptoms and 3 related to clinical examination
- painDETECT was developed and validated in German and incorporates a self-report questionnaire with 9 items that do not require a clinical examination.
- ID-Pain consists of 5 sensory descriptor items and 1 item relating to whether pain is located in the joints (used to identify nociceptive pain); it also does not require a clinical examination
- Screening tools fail to identify about 10–20% of patients with clinician diagnosed neuropathic.

**PROBABLE NEUROPATHIC PAIN**

- Primarily based on the clinical examination of a pain patient with a possible neuropathic pain condition is aimed at verifying or rejecting the hypothesis of a lesion or disease of the somatosensory system, which fits the assumed injured/diseased level of the nervous system as extracted from the history
- Sensory, motor and autonomic signs should be sought
- A careful bedside examination of somatosensory functions is recommended, including touch/vibration, cold, warmth and pain sensibility
- Look for Positive sensory phenomena (allodynia and Hyperalgesia) and Negative sensory phenomena (hypoesthesia and hypoalgesia)
- Clinical examination alone is less sensitive but the relevance of clinical examination to differentiate neuropathic pain from non-neuropathic pain has been demonstrated in several studies using large sample sizes
- Allodynia to brush, cold and heat and temporal summation to tactile stimuli, although not pathognomonic, was observed with much higher frequency in patients with neuropathic pain

**DEFINITE NEUROPATHIC PAIN**

- Reflexes
- Evoked potentials
- Microneurography
- Functional brain imaging
- Skin biopsy
Who is the right candidate – Indications and Tips

Common indications

- Malignancy with intractable pain - Morphine
- Spasticity – baclofen
- Other non-malignant intractable pain conditions (e.g. FBSS)

Chronic pain states treated with ITDDS

- Cancer pain
- Post-laminectomy Syndrome
- Nerve root injury
- Adhesive spinal arachnoiditis
- Brachial or lumbosacral plexitis
- Complex regional pain syndrome Type I (reflex sympathetic dystrophy) Type II (causalgia)
- Spinal cord injury pain Phantom pain
- Postherpetic neuralgia
- Painful peripheral neuropathy Poststroke pain
- Intractable angina HIV-related pain

Ideal patients

- Life expectancy - >3months
- Minimal psychological issues
- Right expectations
- Good family support
- Ready to be compliant for follow up

Proper workup

- Blood investigations
- Setting the expectations right
- Discuss procedure details – GA vs LA
- Discuss site of pump implantation – PRO and CONS
- Discuss refilling procedure
- Discuss side effects – Drugs, Catheter, Pump, surgical technique
- Psychological counseling – Patient, relatives

Bio-Psycho-Social

- “The only antidote for mental suffering is physical pain.”
  Karl Marx

- Watch for pain out of proportion to underlying condition
- Evaluation by pain psychologist is ideal before trial of intrathecal drug – May prevent risk of failure by identifying risk factors
PSYCHOLOGICAL RISK FACTORS ASSOCIATED WITH POOR OUTCOME OF IMPLANTABLE PAIN DEVICES

**Risk Factors**
- Thought disorders
- Personality disorders
  - Borderline personality
  - Anti-social personality
- Mood disorders
  - Major depression
- Somatization disorders
  - Undifferentiated somatoform disorder
  - Conversion disorder
  - Hypochondriasis
  - Body dysmorphic disorder
- Addiction disorder
- Alcohol or drug abuse in primary caregiver
- History of physical and/or sexual abuse
- Emotional abuse or neglect in primary caregiver
- Catastrophizing
- Dementia or other cognitive disturbances
- Excessive anxiety
- High levels of psychosocial distress

**Suggested Referral Questions for Psychological Evaluation**
Identify any untreated or under treated major affective disorder
Axis II (personality/character) disorder
Effects on the perception of pain, compliance, cooperation, etc.
Any untreated or under treated alcohol or drug problems (present or past)
Exceptions/attributions regarding pain and proposed therapy
Nonphysical factors and their contribution to patient's pain perception and behaviour
Type and degree of social support

What is intrathecal pump
- Components
- Medtronic SynchroMed™ II pump - stores
catheter - delivers
Clinician Programmer - program the pump to meet the needs of your patient
Patient therapy manager (Remote)

Post op Complications
- Immediate
- Late

COMPARISON OF EPIDURAL VS. INTRATHECAL DRUG INFUSION

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Intrathecal</th>
<th>Epidural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset of Action</td>
<td>Faster onset</td>
<td>Slower onset</td>
</tr>
<tr>
<td>Systemic Effects</td>
<td>Minimal systemic effects</td>
<td>Larger systemic effects</td>
</tr>
<tr>
<td>Duration of Effect</td>
<td>Long-lasting</td>
<td>Short-lasting</td>
</tr>
<tr>
<td>Dosage</td>
<td>Smaller dose (1/10 Epidural dose for morphine)</td>
<td>Larger dose required</td>
</tr>
</tbody>
</table>
| Adverse Effects     | Post-LP headache, Risk of meningitis | More systemic side effects | Risk of epidural abscess
|                     |                              | Respiratory depression         |
FACTORS AFFECTING DRUG DELIVERY WITH CONSTANT FLOW INFUSION PUMPS -

Programmable pumps are variable and adjustable flow types

Body temperature

- calibrated for 37°
- 10% - 13% increase in flow per 1° rise in temp

Geographical elevation

- Calibrated for elevation of implanting center
- Flow increases at higher altitudes

Blood pressure (at site of drug discharge)

- Inversely proportional
- -3% change for every 10 mm Hg MAP ·

Drug viscosity

Reservoir capacity
- Low rate calibrated for 50% capacity –

- 4% variability at extremes of volume

Pump “Dead Space”

- 4 mL “dead volume”
- Correction factor for concentration
EFFECT OF ADDITION OF PREOPERATIVE ORAL PREGABALIN TO PERIOPERATIVE INTRAVENOUS LIDOCAINE INFUSION ON POSTOPERATIVE PAIN AND PERIOPERATIVE STRESS RESPONSE IN PATIENTS UNDERGOING ELECTIVE LAPAROTOMY: A DOUBLE BLIND RANDOMISED CONTROLLED TRIAL

Author: Dr. Jigish Ruparelia, JIPMER, Pondicherry
Co-Author(s): Sarath Chandra Sistla, Gomathi Shankar
Paper Id: ISSP002

Introduction
Postoperative pain remains a significant problem in patients undergoing abdominal surgeries, and has a profound effect on patient recovery. High dose opioids hamper bowel motility and increase nausea and vomiting. Intravenous lidocaine has been used as part of a multimodal analgesia protocol for providing effective pain relief and attenuating surgery-associated inflammatory response. Preoperative pregabalin also has a beneficial effect in reducing pain. This study was carried out to assess the efficacy of combining these drugs in reducing pain, paralytic ileus and stress response.

Methodology
All patients undergoing elective laparotomy and satisfying the study criteria were randomised into two groups. Group A patients received preoperative placebo and intraoperative lidocaine infusion. Group B patients received preoperative pregabalin and lidocaine. Pain was assessed using visual analogue scale at 2, 6, 18 and 24 hours postoperatively. Morphine consumption on a patient controlled analgesia pump was noted. Time to first passage of stools and flatus, and incidence of nausea and vomiting were noted. Surgical stress response was assessed by measuring perioperative total leucocyte count, interleukin-6 and C-reactive protein.

Results
Postoperative pain scores at 6, 18 and 24 hours were significantly lower in Group B patients who had received pregabalin. These patients also had lower morphine consumption and earlier bowel recovery as measured by first passage of stools. Perioperative inflammatory markers were similar in both groups.

Discussion
Preoperative pregabalin when used with intravenous lidocaine has a synergistic effect on reducing postoperative pain and opioid consumption. This also has beneficial effect on return of bowel function. However, it did not have a significant additional effect on attenuation of the inflammatory component of surgical stress response.
COMPARISON OF 4 MG DEXAMETHASONE VERSUS 8 MG DEXAMETHASONE AS AN ADJUVANT TO LEVOBUPIVACAINE IN FASCIA ILIACA BLOCK- A PROSPECTIVE STUDY
Author: Dr. Bhavna Sriramka, IMS AND SUM hospital
Paper Id: ISSP003

ABSTRACT:
INTRODUCTION: To compare the effects of adding two different doses of dexamethasone on the duration and quality of the fascia iliaca block in patients undergoing proximal femoral fracture surgery.

METHODOLOGY:
A total of 60 patients (age 18-70 years) undergoing proximal femoral nailing surgery in spinal anesthesia were given fascia iliaca block after random assignment to one of the two groups: Group H- received injection levobupivacaine (0.5%) 28 ml plus 2 ml (8 mg) dexamethasone & Group L received injection levobupivacaine (0.5%) 28 ml plus dexamethasone 1ml (4 mg) plus 1 ml normal saline. Assessment of duration of analgesia and total tramadol requirement over 48 hours were noted after a successful block.

RESULTS:
The duration of analgesia was found to be significantly longer in Group H (17.02 ± 0.45 hr) than the Group L patients (14.29 ± 0.45 hr) with a p-value of 0.000. Postoperative analgesic requirement (amount of tramadol in mg) was significantly higher in Group L (Q2: 200.0; IQR: 100.0, 200.0) as compared to Group H (Q2: 100.0; IQR: 100.0, 200.0) with a p-value of 0.034. No patient showed any sign of neurotoxicity.

CONCLUSION:
Dexamethasone in a dose of 8mg is superior to 4mg when used as an adjuvant with levobupivacaine in FIB. Though both prolonged analgesia and effective reduction of oral/intravenous analgesics, 8mg dexamethasone can be recommended as a more efficacious adjuvant to local anesthetics in FIB.

KEYWORDS:
Postoperative Pain, fascia iliaca block, Levobupivacaine, Dexamethasone.
PROLOTHERAPY TREATMENT FOR MYOFASCIAL PAIN CAUSED BY INTRAMUSCULAR HEMANGIOMA.

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Co-Author(s): Dr Kailash Kothari

Paper Id: ISSP004

Summary:
Intramuscular hemangioma is an infrequent but important cause of musculoskeletal pain, which is often difficult to diagnose clinically. Prolotherapy is a technique that involves injection of an irritant usually a hyperosmolar dextrose solution typically in the treatment of chronic painful musculoskeletal conditions.

Aim of investigation:
to present results of dextrose prolotherapy for myofascial pain caused by intramuscular hemangioma.

Methods:
this report describes a case of 22 yr old male patient who was referred to pain clinic for severe left calf pain since 2 years. On examination there was severe tenderness and swelling in calf of left leg upper aspect. MRI confirmed intramuscular hemangioma in soleus muscle of left leg. Initially he took conservative treatment in the form of medications, ayurvedic treatment and sclerotherapy for hemangioma in left calf but it failed to alleviate the symptoms. At pain clinic we treated with prolotherapy injection dextrose 25% 6 ml + inj sensorcaine 0.25% 4ml for myofascial pain. 3 injections were given at interval of 21 days each.

Results:
it demonstrated pain relief after each injection VAS was reduced from 8 to 5 after 1st injection and 3 after 2nd injection and 0 after 3rd injection.

Conclusion:
myofascial pain can be caused by intramuscular hemangioma though a rare cause should be considered in differential diagnosis, if patient with muscle pain associated with soft tissue mass not responding to conservative treatment. Prolotherapy is an effective treatment option in patient with chronic recalcitrant myofascial pain and should be used before surgical intervention in pain caused by hemangioma.
SUMMARY:
Herpes zoster (HZ) or shingles is a viral neurological disorder worldwide with an average incidence of 2.2 – 3.4/1000 persons/year. It occurs as a result of the reactivation of latent varicella zoster virus (VZV) in spinal or cranial sensory ganglia. Individuals affected by the reactivated herpes zoster develop characteristic painful vesicular skin lesions in the affected dermatomes. Severity of acute pain and older age are the most important risk factors in the development of post herpetic neuralgia, a potentially crippling, persistent pain disorder.

Early treatment of the infection and pain is believed to reduce the severity of acute pain of herpes zoster and risk for PHN. Epidural blocks targeted to the involved dorsal root ganglia are considered more effective for decreasing the pain intensity of zoster associated pain. Parasagittal approach of epidural block has been recently recommended for herpetic neuralgic pain due to a better epidural spread to the affected dorsal root ganglion.

AIMS OF STUDY:
1. To evaluate duration and degree of pain relief following epidural blocks.
2. To detect any complication as a result of these interventions.

MATERIAL AND METHODS:
A randomised, double blind study was conducted to evaluate the efficacy of midline versus parasagittal epidural approach in addition to standard antiviral and analgesic therapy in the management of acute herpes zoster (<4 weeks duration) involving lumbosacral dermatomes.

Midline or parasagittal epidural blocks were randomly carried out in 25 patients in each group using triamcinolone (kenacort) 60 mg in 3 ml saline. Pain assessment was done using a Numeric Rating Scale (NRS) and Neuropathic Pain Symptom Inventory (NPSI). Patients were followed up for 12 weeks at 1st, 3rd, 6th and 12th week.

RESULTS:
NRS and NPSI scores were significantly improved in both the study groups as compared to baseline during 12 weeks of study period. However, the improvement in pain scores was significantly better in parasagittal then midline epidural approach. The requirement of rescue analgesic was also significantly less in parasagittal than midline group. The incidence of complications was comparable in both the study groups.
CONCLUSION:
The use of parasaggital epidural block in addition to standard anti viral and analgesic therapy provided superior degree of pain relief than midline epidural block in acute herpetic neuralgia patients.
COMPUTED TOMOGRAPHY GUIDED LUMBAR SYMPATHECTOMY AS A PALLIATIVE TREATMENT IN PATIENTS WITH REST PAIN DUE TO PERIPHERAL VASCULAR DISEASE OF LOWER LIMBS

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Co-Author(s): Anurag Chahal, Surabhi Vyas, Sunil Chumber, Sanjay Sharma

Paper Id: ISSP006

Aim
To evaluate the efficacy of computed tomography guided lumbar sympathectomy (CTLS) and its technical parameters in patients with rest pain due to critical limb ischemia

Materials & Methods
All patients with rest pain due to peripheral vascular disease of lower limbs not amenable to endovascular or surgical revascularization procedures were included in the study after obtaining approval from Institute Ethics Committee and informed consent. Exclusion criteria were proximal arterial lesion without distal disease and coagulopathy. The CTLS was performed with patient in prone position and 22G needle placed at the L2-L3 vertebral level bilaterally, with needle tip dorsolateral to the abdominal aorta (for left-sided sympathectomy) or the inferior vena cava (for right-sided sympathectomy). A mixture of absolute alcohol (99.9%) and non-ionic contrast medium in the ratio of 10:1 (maximum amount - 10 mL/side) was injected slowly. Patients with medial spread (medial to the lateral margin of the vertebral body) of the neurolytic agent were categorized into group A and without medial spread into group B. Numerical pain score (NPS) and ulcer healing were assessed before the procedure and after the procedure at 3 weeks, 3 months and one year.

Results
Thirty patients (28 males, 2 females) with mean age 45.2 years were included in the study. 22 (73.3%) patients had distal disease (below the knee) and 8 patients had both proximal and distal disease on imaging. All patients had rest pain and 23 had ischemic foot ulcers. There were 22 (73.3%) patients in group A and 8 (26.7%) patients in group B. The clinical features were not significantly different between the 2 groups (p=0.5). The mean volume of absolute alcohol injected per side was 7.1 mL in group A and 7.63 mL in group B (p=0.49). No major complications were noted. Mild complications were seen in two (6.7%) patients. The mean NPS pre-procedure, at 3 weeks, 3 months and 1 year post-procedure were 7.31, 2.95, 2.47 and 2.10 in group A and 6.25, 4.125, 4.5 and 4.35 in group B respectively; this difference was statistically significant (p<0.001). Further, in group A, 11 of 15 patients (73.3%) showed ulcer healing at one year follow up while none of the group B patients showed ulcer healing at 1 year (p value<0.0001).

Conclusion
CTLS is a simple, safe and effective procedure in patients with rest pain due to critical limb ischemia with medial spread of the neurolytic agent providing significantly better results.
EFFICACY OF ERECTOR SPINAE PLANE BLOCK FOR POSTOPERATIVE ANALGESIA IN BREAST CANCER SURGERY

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Paper Id: ISSP007

Background and objectives:
Women undergoing breast cancer surgery often experience severe post-operative pain and may develop chronic postoperative pain. This study was conducted to evaluate the analgesic efficacy of erector spine plane (ESP) block for postoperative analgesia in breast cancer surgery. The primary outcome of this study was 24 hour morphine consumption and secondary outcomes were time to first rescue analgesia, pain scores and adverse effects.

Methods:
After institutional ethics committee approval, 60 ASA I or II patients aged 18-60 years, scheduled for elective breast cancer surgery were randomly allocated in to either ESP group or control group. Ultrasound (US)-guided ESP block with 0.4ml/kg of 0.5% ropivacaine at the T5 vertebral level was performed preoperatively in ESP group. The control group received no intervention. Twenty minute following the administration of block, all the patients were assessed for dermatomal segments showing decreased sensation to pin prick from T2 to T8. All the patients received general anaesthesia with fentanyl 1μg/kg, propofol 2-2.5 mg/kg & atracurium 0.5mg/kg. Intraoperative hemodynamic parameters and any additional fentanyl requirement were observed. Patient-controlled morphine analgesia was used for postoperative pain relief in both the groups. Postoperatively all the patients were assessed for pain using NRS score at fixed time intervals for 24 hours, time for first rescue analgesia and total analgesic consumption in first 24 hours were noted. Any other parameters like PONV, side effects or complications were also noted.

Results:
24 hour morphine consumption was significantly lower in the ESP group. Morphine consumption decreased by 42% at 24 h compared to the control group (2.9± 2.5 mg vs 5.0 ± 2.1 mg) with P-value of 0.01. The NRS score was significantly lower in ESP group at all intervals up to 6 hours of surgery (p<0.05).26 patients in control group vs 14 in ESP group used rescue analgesia within 1 hour of surgery. No rescue analgesia was used by 6 patients in ESP group compared to 1 in control group (p=0.04).

Conclusions:
Our study findings show that US-guided ESP block exhibits a significant analgesic effect in patients undergoing breast cancer surgery. Further studies comparing different regional anesthesia techniques are needed to identify the optimal analgesia technique for this group of patients.
PREVALENCE OF PAIN ORIGINATE FROM FACET JOINT IN CHRONIC LOW BACK PAIN PATIENTS WHO HAVE RADIOLOGICALLY DIAGNOSED “PROLAPSED INTERVERTEBRAL DISC AND FACET JOINT ARTHROPATHY” - A PROSPECTIVE ANALYTICAL STUDY

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Paper Id: ISSP008

SUMMARY:
Low back pain (LBP) is one of the most common health problem and among the causes facet joint arthropathy is 24-40%, disc herniation and nerve root irritation in 13-20%, discogenic pain in 26%1 . Often based on the MRI report showing “PIVD and facet arthropathy”, clinicians facetiously diagnose PIVD, ignoring facet joint which is a major source of LBP.

AIM:
To diagnose the prevalence of facet joint pain in “MRI proved PIVD and facet arthropathy” with the help of clinical evaluation and confirmation by diagnostic median branch block.

METHODS:
Considering inclusion and exclusion criteria, prospective analytic study was done during the period of 6 months (January-July 2018) in a city based state referral centre of India, after taking ethical permission and CTRI registration. With written informed consent, 65 patients of chronic LBP with radiological diagnosis of “PIVD and facet arthropathy” were clinically examined for the signs and symptoms of pain originating from facet joint only.

Inclusion Criteria
1) Age 18-60 years.
2) Pain >3 months
3) VAS > 4

Exclusion criteria
1) Neurological
2) Bowel, bladder incontinence
3) History of trauma
4) Prior low back surgery
5) Primary or metastatic spine tumor or spinal cord injury
6) Allergy to medications used in procedure
7) Diabetes mellitus
8) Blood coagulation disorder
9) Pregnancy

Clinically suspected facet joint arthropathy patients, had undergone diagnostic median branch block using 1% lignocaine and 0.25% bupivacaine in two different sittings. At least an 80% reduction of pain2 and concordant pain relief with dual block3 was considered as positive response.

Diagnostic MBB positive -> Group P
Diagnostic MBB negative -> Group N

Prevalence = (Group P ÷ Study population) × 100

All data was recorded and appropriate statistical analysis was done.

RESULTS:
Out of 65 patients, 50 patients were clinically suspected to have facet joint arthropathy and had undergone controlled dual median branch block.

Group P = 36
Group N = 14

Prevalence of pain originate from facet joint in “MRI proved PIVD & facet arthropathy” patients = 
\[
\frac{36}{65} \times 100 = 55.38
\]

Therefore, calculated prevalence was quiet high, 55.38%.

CONCLUSION:
Nowadays MRI used for general diagnosis of LBP causes bias. As symptoms and MRI results correlate poorly, it is important to emphasize on thorough clinical correlation. Diagnostic block is very important tool for confirmation of clinical diagnosis. Facet joint is major causative structure causing LBP and that should be given due importance.

FINANCIAL SUPPORT AND SPONSORSHIP: Nil. CONFLICTS OF INTEREST: There are no conflicts of interest.

REFERENCES:


Introduction:
Postoperative pain management is of great importance in perioperative anaesthetic care as it is the most common cause of delayed discharge after ambulatory surgery. Transverse abdominis plane (TAP) is a new technique of postoperative analgesia in patients of inguinal hernia repair.

Aims:
We compared two techniques of postoperative management, Transverse Abdominis Plane block and wound infiltration with local anaesthetic in inguinal hernia repair in terms of total duration of analgesia (Time at which patient first requested for opioid) and patient satisfaction score.

Methods:
After written consent patients were randomly divided into two groups. Patient of USG guided TAP block group (T) [N=30] and patient of local anaesthetic wound infiltration (I) [N=30]. All patients were uniformly premeditated and then induced with Propofol and relax with Vecuronium. TAP block with ultrasound and local anaesthetic infiltration was done in patients according to the group in which they were assigned. Group T received ultrasonography guided TAP block with 0.25 ml/kg of 0.25% of levobupivacaine on the same side as the hernia after the completion of surgery under general anaesthesia.
Group I received wound infiltration with 0.25ml/kg of 0.25% of levobupivacaine at the site of incision after the completion of surgery under general anaesthesia. Postoperative pain was assessed by NRS score. All patient received injection tramadol 2mg/kg as rescue analgesic when NRS score was 3 or more. Total duration of analgesia and patient satisfaction score were assessed.

Results:
The average duration of analgesia in TAP block was 5.15± 1.2 hr whereas it was 2.1± 0.45 hr in wound infiltration group (p= 0.04). Analgesia lasted more than 5 hours in 26 patients in TAP block whereas it was only 2 patients in group I. In TAP block group, 12 patients were very satisfied, 14 were satisfied and 2 patients were not satisfied with TAP block whereas in wound infiltration group 1 was very satisfied, 7 were satisfied whereas remaining 22 were not satisfied. No major complication was found in both the groups.

Conclusion:
TAP block was found to be better than local wound infiltration in terms of total duration of analgesia as well as patient satisfaction score.
TO PREDICT THE REQUIREMENT OF ANALGESICS IN THE POSTOPERATIVE PERIOD BY ASSESSING PREOPERATIVE ANXIETY AND PAIN THRESHOLD IN PATIENTS UNDERGOING MAJOR ABDOMINAL SURGERY

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Paper Id: ISSP010

INTRODUCTION
Anxiety toward pain has been shown in several studies to increase postoperative pain after surgical procedures. This anxiety can be measured by several validated questionnaires. In this study we have assessed preoperative pain threshold and used HAM-A Scale to assess pain anxiety. Preoperative scores on this scale and preoperative pain threshold correlates with increased anxiety that can predict requirement of analgesics in the post-operative period.

OBJECTIVE
To assess relationship between preoperative pain anxiety and pain threshold with requirement of postoperative analgesics in major abdominal surgery.

MATERIAL AND METHODS
Study was conducted in tertiary care hospital on 100 patients of 20-60 years age group. Informed consent was taken. Preoperatively patient anxiety was assessed by HAM-A Scale questionnaires and pain threshold was assessed by Algometer. The requirement of analgesics in postoperative period was assessed in first 24 hrs. Data analysed using SPSS version 20. To find out correlation Pearson correlation test was used.

RESULT
It was observed that individuals with high anxiety scores and lesser pain threshold also has higher requirement of postoperative analgesics which is statistically significant.

CONCLUSION
This study shows that preoperative anxiety and pain threshold affects postoperative pain and hence postoperative analgesic requirement.
EFFECT OF DRY NEEDLING FOR PAIN RELIEF IN POST SPINAL SURGERY SYNDROME PATIENTS WITH MYOFASCIAL PAIN - AN OPEN LABEL PROSPECTIVE STUDY

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Paper Id: ISSP011

Summary: Post spinal surgery syndrome (PSSS) is a condition characterized by back pain with or without leg pain that occur after spinal surgery. The IASP defines PSSS as – Lumbar Spinal pain of unknown origin either persisting despite surgical intervention or appearing after surgical intervention for spinal pain. Pain is a result of the changes that happen in the spine due to surgery or its complications, mainly formation of myofascial trigger points, which showed to be improved by Dry Needling, which is an invasive procedure in which a filiform needle is inserted into the skin and muscle directly at a myofascial trigger point. We want to see how minimally invasive procedure like dry needling relives pain, for which we have conducted study on 30 patients with PSSS and observed that dry needling results in short term pain relief in PSSS patients.

AIM:
To study the efficacy in pain relief and improvement in functional disability by dry needling in PSSS patient with myofascial pain.

MATERIALS AND METHODS: The Institutional Ethics committee approval and informed and explained consent from each patient was obtained. The study was done in a ESI institute of Pain Management (EIPM) in Kolkata between the month of February 2018 and May 2018.

Inclusion Criteria
• Age 18-65
• Operated for spinal pathology
• Persistent back pain > 6 months
• Not responding to conservative treatment

Exclusion Criteria
- Patient having needle phobia or behavioural disorder.
- Bleeding disorder or on anticoagulant medication.
- Localized or systemic infection.
- Red flags sign for spinal pain in FBSS.
- FBSS with Radiculopathy.
Sample Size-30 patients
Pain Measurements Scales:
1. Numeric Rating Scale
2. Roland Morris Disability Questionnaire
Pain score taken at Day 0,7,14 and 90.

Results:
The study conducted on random sample of 30 patients, we concluded that, the dry needling procedure leads to substantial decrease in pain in the short term, whereas there is inconsiderable change in the long run.

Conclusion:
Over all the study concluded that patients suffering from post spinal surgery syndrome with myofascial pain were benefited in the short term by the Dry Needling Procedure. However, the benefits over long term were not substantially different.

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Conflict of Interest: Nil
A SURVEY ON THE IMPACT OF PAIN AMONG INDIAN ADULTS

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Paper Id: ISSP013

Summary
According to the Global Pain Index (GPI) study¹, majority of adults experience both headache and body pain during their lifetime. Pain has a significant negative impact on the quality of life (QoL). Globally, pain in the back, legs and shoulder are among the top 10 conditions responsible for the most years lived with disability.²

Aim of Investigation
The GPI study was conducted across 32 countries to capture the true impact of pain on an individual’s day-to-day life. Here, we present data from India.

Methods
In 2016, GSK CH conducted a 30-minute online survey among adults aged ≥18 years who had experienced body pain and/or headache at some point of their lives. The survey questionnaire assessed the following parameters: Type of pain experienced; impact of pain on economic, societal, emotional, social, personal, and parenting variables; diagnosis of pain; treatment of pain; and trust in sources of information about their pain.

Results
Among the 506 respondents participating in the survey, body pain and headache were experienced by 94% and 89% of them. The commonly experienced body pain was, pain in the back (28%), followed by lower back (24%), legs (24%), and shoulders (24%). Pain impacted the respondent’s QoL; emotions; moods; ability to concentrate and perform better at work; self-esteem; ability to interact with others; family time; parenting abilities; and, national economy. Body pain led 75% of Indian sufferers take off from work and cost an estimated INR 65090 crore annually. Most respondents knew the cause for their pain (body pain 96%; headache 97%). Majority of respondents managed their new pain by visiting a doctor, self-medicating, or consulting a pharmacist; and preferred to seek advice from a healthcare professional, only if the pain persisted, got worse, or became unbearable. Nearly 46% of respondents with body pain and 47% with headache, chose to remain silent about their pain; 59% preferred pain killers and 95% of respondents considered doctors as the most trusted source of information about their pain.

Conclusion
Among those surveyed, body pain impacts over half of adult pain sufferers in India, and headache impacts nearly one-third on a weekly basis. Beyond physical and emotional effects, pain also has a significant health-economic impact. These findings are in line with what physicians have observed regarding the negative impact of pain on daily lives of the patients in the rest of the world³.
highlighting the need for optimal pain management and educational programs among adults in India.

Acknowledgments/Disclosures
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References
CONTINUOUS ERECTOR SPINA PLAN (ESP) BLOCK PROVIDES EXCELLENT PERIOPERATIVE ANALGESIA
FOR PNEUMOTHORAX DRAINAGE FOLLOWED BY MASTECTOMY UNDER GENERAL ANAESTHESIA -
A CASE REPORT.

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Paper Id: ISSP014

SUMMARY:
The erector spinae plane (ESP) block is a relatively new, fascial trunk block. Its use has recently been described for breast surgery and other thoracic procedures. We present its successful utilisation for perioperative analgesia to facilitate intercostal chest tube placement followed by mastectomy under general anaesthesia.

AIMS: Evaluation of continuous erector spinae plane (ESP) block as a per-operative analgesic modality for pneumothorax drainage followed by mastectomy under general anaesthesia.

METHODS:
A 65 year old female presented with infiltrating left breast malignancy. Pre-operative work up for radical mastectomy, revealed a co-existing left secondary, spontaneous pneumothorax. This undrained pneumothorax necessitated chest tube placement prior to general anaesthesia, to avoid a tension pneumothorax, secondary to positive pressure ventilation.

Pre-operatively, a left ESP block was performed using an 18G PNB needle -20G catheter set; a 0.5% Ropivacaine bolus was administered and the catheter placed, in the fascial plane between erector spinae and the T5 transverse process.

After confirmation of diminished sensation in the left hemi-thorax, from T2 Dermatome above and T8 dermatomal level below; almost pain-free chest tube placement was successful, in the left 5th intercostal space. The patient was subsequently intubated using Propofol and Atracurium and maintained on IPPV with sevoflurane and N2O, till the completion of the surgery.

Post operatively, the patient received continuous Ropivacaine 0.2% infusion and Inj Paracetamol 8 hourly, for pain relief. Pain scores were assessed regularly by Visual analogue scores [VAS] and the patient monitored for complications.

The indwelling ESP catheter was removed after 28 hours, on transfer from the post-operative ward.

RESULTS:
Postoperative Pain scores remained low throughout, barring one episode [VAS= 4], which was successfully treated with a single rescue bolus of Lignocaine 2%. The patient required no additional rescue analgesic doses of opioids or NSAIDS. No postoperative complication occurred, apart from two instances of mild nausea.
CONCLUSIONS:
The recently described Erector Spinae Plane (ESP) block shows promise as a technically easy procedure, with a likely better safety profile than the standard US guided paravertebral block [US-PVB]. We thus opted for this block in preference to US-PVB and also other combined myofascial blocks [PEC I, Pec II and Serratus Anterior block] - which entail multiple needle insertions. Prospective randomized controlled trials, preferably comparing it to the standard US-PVB, may establish its role more clearly as an analgesic technique for mastectomy and other thoracic procedures.
Summary:
Shoulder pain is the second most common musculoskeletal disorder in adults. Shoulder disorders are often accompanied by acute, sub-acute or chronic pain and limited range of motion which affects upper extremity joint function and quality of life. Effective management of shoulder pain demands a multidirectional approach including medication, physical therapy, rehabilitation, surgical procedures, and selective nerve block for local pain control. Suprascapular Nerve Block is a useful tool for pain control for different shoulder chronic pain syndromes. If short-term effect of nerve block using local anesthetics is not sufficient, pulsed radiofrequency (PRF) ablation of the suprascapular nerve may be used for long-term pain relief.

Aims of Investigation:
Aim of this study is to see the efficacy of USG guided PRF ablation of suprascapular nerve for management of chronic shoulder pain.

Subjects and method:
Inclusion criteria:
1. Shoulder pain for more than 3 months not reliving by physiotherapy, medications and other conservative therapies.
2. At least 50% pain relief after diagnostic ultrasound guided suprascapular nerve block.

Exclusion criteria:
1. Full thickness rotator-cuff tear in MRI imaging.
2. Cervical Radiculopathy
3. Uncontrolled diabetes
4. Coagulopathy

After taking ethical permission and informed written consent from the patients 30 patients fulfilling the inclusion and exclusion criteria were included in the study and Ultrasonography guided PRF ablation of Suprascapular nerve was done. Pain in Visual Analogue Score with range of motion of the affected shoulder joint measured by goniometer (Flexion, Extension, Adduction, Abduction,
External Rotation, Internal Rotation) were recorded at Day 0, after 4 weeks, 8 weeks and 12 weeks and all the data were analyzed by one way ANOVAs test.

**Results:**
1. Pain: Analyzing Tukeys HSD Post Hoc analysis table it was seen that the VAS had significantly reduced (p<0.05) immediately after injection and pain reduction sustained up to 12 weeks. However, no significant difference was found in between the values recorded at various Post PRF intervals.
2. Goniometric measurements: There was statistically significant increase in Flexion and Abduction after PRF. Though the range in extension, Adduction, internal rotation, external rotation was increased but not statistically significant.

**Conclusion:**
PRF of suprascapular nerve under USG guidance is a safe operative procedure and it is an effective treatment modality for management of chronic shoulder pain. The effects of PRF lasts upto 12 weeks thereby assisting the patient in undergoing relatively painless physiotherapy.

Conflict of interest: NIL
Financial Support: NIL
EFFECTIVENESS OF DEXMEDETOMIDINE V/S FENTANYL AS ADJUVANT TO INTRATHECAL-BUPIVACAINE IN INFRAUMBILICAL GYNECOLOGICAL SURGERIES

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Paper Id: ISSP016

Summary:
This observational study aimed at comparing the effects of use of Dexmedetomidine versus Fentanyl as adjuvant to intrathecal - Bupivacaine during spinal anesthesia. Study primarily focused on assessment of block characteristics, duration and quality of analgesia, hemodynamic parameters and possible side effects. We conclude that Dexmedetomidine can be a great choice as an adjuvant in spinal anesthesia due to its excellent analgesic properties and minimal side effects.

Aim of investigation:
Study was aimed at studying the effectiveness of intrathecal - Dexmedetomidine v/s Fentanyl as an adjuvant to bupivacaine in infraumbilical gynaecological surgeries. Objectives included - onset and duration of sensory & motor blockade, time for two-segment regression, duration and quality of analgesia, hemodynamic parameters and possible side-effects.

Methods:
After approval from Ethical Committee at Rural Medical College, Pravara Institute of Medical Sciences, Loni, this observational prospective study was conducted between October-2013 to September-2015 on 100 adult patients after informed consent with inclusion criteria of ASA physical status I-II, aged 20-60 years, posted for elective infraumbilical gynaecological surgeries under spinal anesthesia. Study excluded unwilling patients, obstetric patients, patients undergoing emergency surgeries, known hypersensitivity to local-anaesthetics, patients with comorbidities like- anemia, heart disease, hypertension, severe hypovolemia, shock, septicemia, coagulation disorders or on anticoagulant therapy, spine deformities, local infection at proposed site of puncture for spinal anesthesia, and failed spinal-anaesthetics. After detailed pre-anesthetic evaluation, patients were randomly allocated into two groups of 50 each, based on intrathecal drug delivered by consulting anesthesiologist-

- Group-BD: 0.5 % hyperbaric bupivacaine 15mg+5µg Dexmedetomidine.
Group-BF: 0.5% hyperbaric bupivacaine 15mg+25µg Fentanyl. Student’s unpaired ‘t’ test, Chi-Square test, Z-test, & SYSTAT ver.12 were used to analyze data.

Results:
In group-BD, average sensory effect lasted for 301.6 minutes and average motor effect 270.90 minutes compared to group-BF where sensory and motor effects averages were 208.80 and 179.68 minutes. While quality of intraoperative analgesia was comparable, average time for first request of analgesic postoperatively was considerably delayed in group-BD. Durations of complete and effective analgesia in group-BD were 337 and 365.70 minutes compared to 179.98 and 213.08 minutes in group-BF.

Conclusion:
Dexmedetomidine produces early onset, prolonged duration of sensory-motor block and prolonged postoperative analgesia when used as an adjuvant to intrathecal bupivacaine. It provides good quality of intraoperative analgesia, longer duration and excellent quality of postoperative analgesia. This results in lesser requirement of rescue analgesics in the postoperative period without serious side-effects. Thus, Dexmedetomidine is an attractive alternative to 25µg Fentanyl as adjuvant to intrathecal bupivacaine in surgical procedures.
ULTRASOUND GUIDED PULSED RADIO-FREQUENCY ABLATION OF AMPUTATION STUMP NEUROMA: A CASE REPORT

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Co-Author(s): Dr Ratan Banik
Paper Id: ISSP017

Introduction:
Post amputation pain (PAP) include phantom pain, phantom sensation, and stump pain. Stump neuroma, the most common cause for post amputation pain, typically occurs between 1-12 months, is due to local proliferation of severed nerve terminals, is a part of normal healing process. Diagnosis & treatment is often difficult. It usually requires multimodal management but still ineffective. We had one such patient with failed traditional therapy, was treated with pulsed radiofrequency ablation (PRF) of the stump neuroma.

Case report:
A 50-year-old male patient who had undergone below-knee amputation 6 months ago was visiting our clinic with a chief complaint of severe pain in the left leg stump. At the time of the visit, the patient pain scored 8-9/10 on the visual analogue scale (VAS). He was unable to wear prosthesis although it had been re-adjusted many times. The physical examination did not reveal any infection or ulcer at the stump. A diagnostic block with 0.25% bupivacaine 5 cc was injected under ultrasound guidance around the stump neuroma improved pain by 50%. Therefore, the patient was diagnosed with stump pain from neuroma. In light of this, we decided to perform ultrasound-guided PRF of the stump neuroma. Under ultrasound guidance, a 10 cm-long needle with a 5 mm active tip was placed as closely as possible to the distal part of the neuroma. Four needles were placed. After 1-2 mL of 1% lidocaine was injected into each needle, PRF was performed three times at 42C for 120 seconds each. After the PRF, 1 ml of a solution containing 5 ml of 0.25% bupivacaine and 1 ml of 40 mg/ml triamcinolone were injected into each needle. One week after the PRF, the patient’s pain had decreased to a VAS score of 2-3/10. In particular, the incidence of the breakthrough pain which occurred when the patient wore the orthosis was decreased to a level of 30% or less. The effect of the PRF has persisted without any exacerbation of the symptoms during the follow-up period of the past 3 months.

Discussion:
US guided PRF of the stump neuroma is a simple and effective procedure in alleviating the PAP compared to other neurolytic procedures. Possible mechanisms by which PRF relieves pain are affecting the neuronal membranes & synaptic signaling, and altering the transmission of pain signal.

References:
A STUDY COMPARING THE EFFECTS OF INTRAOPERATIVE ADMINISTRATION OF SYSTEMIC/ EPIDURAL/ INTRATHECAL MORPHINE ON THE QUALITY OF RECOVERY IN PATIENTS UNDERGOING SUBSTITUTIONAL URETHROPLASTY WITH BUCCAL MUCOSAL GRAFT: A DOUBLE-BLIND PROSPECTIVE RANDOMIZED CONTROLLED STUDY

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Paper Id: ISSP018

BACKGROUND:
Substitution urethroplasty with buccal mucosal graft surgery is done to repair urethral stricture. The buccal mucosa and perineal area have an immense nerve supply, surgical procedure thus produces moderate to severe pain in the post-operative period. If this pain isn’t addressed, it significantly impairs the quality of recovery.

AIM:
To compare the effect of different modes of analgesic techniques (intravenous, epidural or intrathecal morphine) on the quality of recovery.

METHODS:
After IRB approval - prospective, double-blind randomized controlled study was conducted in ASA I, II patients, aged between 18-60 years with normal renal functions. A total 93 patients were recruited and randomly assigned into three groups GroupA–systemic morphine(0.1mg/kg), GroupB-Epidural(3mg morphine+5ml of 0.2%Bupivacaine), and GroupC-intrathecal (150µg morphine+ 1 ml of 0.5% heavy bupivacaine). Standard anaesthesia protocol was followed for induction and maintenance. All patients received 0.5 µg/kg of fentanyl bolus for each pain response. Inj. Paracetamol 20mg/kg as a multimodal analgesic technique and Inj. Dexamethasone(0.1mg/ kg) and Ondansetron(0.1mg/kg) was given for prevention of postoperative nausea and vomiting and pruritis. At the end of surgery patients were extubated, CADD pump was connected to deliver morphine IV-PCA and shifted to PACU. Postoperatively, blood pressure, heart rate, respiratory rate, sedation score, incidence of PONV, pruritis, pain score at the buccal and urethral site, were recorded at regular intervals. Time of initiation of oral fluids, time to ambulate, and time of hospital discharge were noted. At 24 hours, the quality of recovery was assessed using the QoR 40 score. The total dose of morphine consumption at 24 hours was also noted.

RESULTS:
The demographic, co-morbidities and the baseline vital parameters were comparable in all three groups. Intraoperative fentanyl and propofol requirements, fluid administered were similar. The duration of anaesthesia was longer for the epidural (305.5±75.6 min) compared to systemic(264.5 ±72.2min) and intrathecal(262.2 ± 69.4). The median total QoR-40 score was 189-systemic and 189-epidural group, and 185- intrathecal group. The heart rate and BP changes were comparable. There were no patients with excessive sedation/respiratory depression in any group. The incidence of PONV and pruritis was more in intrathecal group and least in epidural group. The time for ambulation, oral fluid intake, hospital stay were comparable in all three groups.
CONCLUSION:
Intraoperative administration of systemic morphine (0.1 mg/kg) or epidural morphine (3 mg) or intrathecal morphine (150 µg) improves the quality of recovery after the substitutional urethroplasty with buccal mucosal grafting. Neuraxial morphine is comparable with intravenous administration for improving the quality of recovery. All three techniques have reduced the postoperative pain score and opioid consumption. The incidence of PONV and pruritis was more in intrathecal group and least with the epidural group.

KEY-WORDS:
Substitutional urethroplasty, neuraxial opioids, systemic morphine, QoR, PONV, pruritis.
RADIOFREQUENCY NEUROTOMY OF GENICULAR NERVES FOR KNEE OSTEOARTHRITIS PAIN

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Paper Id: ISSP019

Introduction
Knee joint is one of the most commonly involved joint for osteoarthritis particularly in elder population. In this retrospective study we have evaluated the efficacy of radiofrequency thermocoagulation of genicular nerves for control of pain of knee joint osteoarthritis.

Design- Retrospective study
Aim of study
To evaluate the efficacy of genicular nerve block in treatment of knee osteoarthritis pain

Material and methods
Sixty patients of knee osteoarthritis with Kallgren Lawrence grade 3 & 4 underwent radiofrequency neurotomy of knee joint after successful ultrasound guided diagnostic genicular nerve block from July 2017 to July 2018. The patients were evaluated for knee pain VAS score (0-10mm), oxford knee score (12-60) and development of any adverse effect at baseline and post procedure at 1, 3, 6 and 12 months.

Results
The mean± SD values for age, weight and duration of symptoms were 63.83±8.17 years, 67.40 ±9.20 kg, and 10.15±7.51 years respectively. Out of 60 patients (40 male, 20 female) 35 patients suffered from KL grade 3 and 25 patients suffered from KL grade 4 osteoarthritis. 31 patients had osteoarthritis at right joint while 29 patients at left joint.

The mean± SD values of Visual analog scale (VAS) (0-10) for knee joint pain were 7.93±1.21, 3.38±1.59, 4.10±2.30, 4.90±1.8 and 5.80±1.71 at baseline and at 1, 3, 6 and 12 months post procedure.

The mean±SD values for OKS score were 40.87±7.66, 23.90±5.60, 25.93±5.48 and 31.43±5.62 at baseline and at 1, 3, 6 and 12 months post procedure.

There was significant decrease in VAS and OKS score between baseline and 1 month (p<.001), baseline and 3 month (p<.001), baseline and 6 months (p<.001) and baseline and 12 months (p<.001).

Conclusion
Radiofrequency thermocoagulation of genicular nerves is a viable option for control of pain of knee joint osteoarthritis.
ANALGESIC EFFECT OF VALSALVA FOR ATTENUATING PROPOFOL PAIN AT INDUCTION OF GENERAL ANESTHESIA

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Paper Id: ISSP020

Summary:
Pain on propofol injection is a major limitation of propofol. So far, there has been no study about valsalva to reduce pain on propofol injection. Valsalva is an analgesic maneuver acting via sinoaortic baroreceptor reflex arc activation and distraction both. We planned this study for assessing efficacy of Valsalva maneuver to reduce pain on propofol injection.

Methods:
Eighty American Society of Anesthesiologists grade I enrolled adult patients undergoing general anesthesia were divided into 2 groups of 40 each; using computerized randomization table. Group I (Valsalva): blew into sphygmomanometer tube and raised mercury column up to 30 mmHg for 20 seconds; Group II (Control): didn’t blow. Immediately after intervention, patients were induced with 1% propofol. Pain was assessed using Visual Analog Scale (VAS) scoring [0- 10; where 0 as no pain and 10 as worst imaginable pain] and Withdrawal response scoring [0-3; where 0 as no pain and 3 as worst pain] and presented as Median [interquartile range].

Results:
Seventy patient’s data were analyzed. Incidence of pain was reduced in Valsalva group (53% i.e. 18 out of 34) in comparison to control group (78% i.e. 28 out of 36) (P<0.05) [Table II]. Withdrawal response score was significantly reduced in the Valsalva group (1[0.00]) as compared to control group (2[1.00]) (P<0.05). VAS was significantly reduced in the Valsalva group (3.50[1.25]) as compared to control group (7[1.00]) (P<0.05).

Conclusions:
Valsalva performed before propofol induction is effective in attenuating propofol pain with an advantage of being non-pharmacological, safe, easy and time effective.
PLATELET-RICH PLASMA INJECTION VERSUS INSTITUTION BASED TRADITIONAL PHYSICAL THERAPY IN PATIENTS WITH DIABETES MELLITUS WITH ADHESIVE CAPSULITIS

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Co-Author(s): Jagannatha Sahoo, P Bhaskar Rao, Somnath Mukherjee, Vithal P Puri
Paper Id: ISSP021

Objective

To compare the effects of single intra-articular platelet-rich plasma (PRP) injection and traditional physical therapy (PT) in patients with diabetes mellitus (DM) with adhesive capsulitis (AC) of the shoulder.

Methods

Patients with DM, with age >18 years of either sex, diagnosed with AC of shoulder, with <6 months duration were included. 70 Patients were randomly allocated into two groups. In group I (n=35), (PRP group), patients were given 4ml of IA-PRP injection into the GH joint under ultrasound guidance and in group-II, (PT group), 35 patients received institution based traditional physical therapy. Institution based PT comprised of 10 sittings of UST, TENS and passive mobilization exercises. All patients were prospectively followed for 12 weeks.

Results

31 patients in PRP group and 30 patients in PT group finished the entire 12 week study period. No significant differences were obtained between 2 groups, in demographic and clinical characteristics at baseline. The improvement in pain intensity, ROM, and shoulder function score was significantly greater in the PRP injection group compared to traditional PT group by the 12 weeks (p<0.5). No major complications were observed in any patients.

Conclusions

IA-PRP injection is a safe and well-tolerated method in adhesive capsulitis, even in patients with diabetes mellitus. IA-PRP injection provided more rapid improvement in pain, ROM and function of the affected shoulder joint compared to traditional PT.
SUPRAORBITAL NEURECTOMY: AN EFFECTIVE ALTERNATIVE OR A PRIMARY CHOICE IN THE MANAGEMENT OF TRIGEMINAL NEURALGIA INVOLVING THE OPHTHALMIC DIVISION?

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Paper Id: ISSP022

SUMMARY
Trigeminal neuralgia (TN) is a commonly diagnosed neurosensory disease of orofacial region involving the fifth cranial nerve. TN usually responds to carbamazepine failing which Microvascular decompression or Radiofrequency ablation of the Gasserian ganglion is performed. Patient refractory to pharmacotherapy or with clinical and/or laboratory side effects sufficient to demand drug cessation is subjected to surgical technique. Here we are presenting a 5 case series of patients with Trigeminal neuralgia involving the ophthalmic (V1) branch who did not respond to conventional modes of treatment, effectively managed by minimally invasive supraorbital neurectomy.

OBJECTIVE
To establish the efficacy of supraorbital neurectomy as a method of management in resistant cases of TN involving Ophthalmic (V1) branch, as it is simple, less invasive, more effective and carries less complications.

CASE SERIES
This paper illustrates the clinical presentation of V1 branch trigeminal neuralgia and emphasises the value of supraorbital neurectomy. We present 5 cases of TN, managed by Supraorbital neurectomy, three cases after failed V1 radiofrequency lesioning and two after temporary relief with percutaneous RF lesioning of supraorbital and supratrochlear nerve. In all the cases Supraorbital nerve was approached by upper eyebrow incision, the nerve was identified and peripheral neurectomy was performed by avulsing the nerve. Supraorbital foramen was blocked by bone wax and layerwise suturing was done. All the patients were followed up for a period of 3 to 6 months for any surgery related complications or recurrence of neuralgia following and none of them had any mentioned complications.

CONCLUSION
Supraorbital Neurectomy is an acceptable surgical procedure which is more expeditious, economical and less morbid and can be considered as first line of management of TN involving ophthalmic division (V1).

REFERENCES
DEVELOPMENT, VALIDATION AND EVALUATION OF A NOVEL SELF-INSTRUCTIONAL MODULE IN PATIENTS WITH CHRONIC NON-SPECIFIC LOW BACK PAIN

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Co-Author(s): Dr Babita Ghai, Dr Dipika Bansal, Dr Neha Chanana, Raju Kanukula, Kapil Gudala

Paper Id: ISSP023

Summary
Low Back Pain (LBP) is ranked highest in terms of disability-adjusted life years (DALYs) lived. Patient education and self-management has shown to play a crucial role in overall management of pain and development of coping skills. There are plenty of research studies from western countries that have evidenced noticeable improvement in chronic low back pain (CLBP) with the use of educational booklet. However, literature on the same with respect to Indian context is still lacking. Therefore, the present study was planned to assess the effectiveness of educational booklet in the form of self-instructional educational module (SIM) in Indian patients with CLBP.

Aim of investigation
To develop, validate and assess the acceptability and effectiveness of self-instructional educational module (SIM) among Indian CLBP patients.

Methods
The study was conducted in pain clinic of a tertiary care public hospital in North India with ‘Back care booklet-SIM’ as intervention in patients with CLBP. 132 patients were administered SIM and verbal explanation. Pain intensity (NRS), Disability, Fear avoidance belief (FABQ), Quality of life (EQ5D) and knowledge level was assessed at baseline and after 3 months of intervention.

Results
In the present study, a total of 120 patients successfully completed the follow up of 3 months. Significant reductions were observed in Pain intensity [baseline vs. follow-up, 76.1 (+/-12.4) vs. 54.6 (+/-14.5), P<0.01]; disability [baseline vs. follow-up, 50.7 (+/-13.9) vs. 43.2 (+/-10.3), P<0.01]; fear-avoidance believes [baseline vs. follow-up, 45.5 (+/-12) vs. 41.4 (+/-10.3), P<0.01]; EQ5D [baseline vs. follow-up, 0.35 (+/-0.27) vs. 0.18 (+/-0.26), P<0.01]. An improvement in the Knowledge level score was also observed [baseline vs. follow-up, 4.31 (+/-1.33) vs. 6.38 (+/-1.36), P<0.01].

Conclusion
The use of back care booklet as an intervention, along with usual pharmacological care is an effective educational medium to promote self-management of CLBP in clinical outpatient setting of a tertiary care level hospital of India.

Disclosure (Financial Assistance)
The study was funded by PGIMER, Chandigarh under Institute under New Institute Research Scheme (vide sanction letter No. 71/8-Edu-15/1613 dated 13/08/2015)
Piriformis syndrome is a neuromuscular disorder that occurs when sciatic nerve is compressed or otherwise irritated by piriformis muscle causing pain, tingling and numbness in buttocks and sometimes along the path of sciatic nerve descending down thigh into leg. In most cases piriformis syndrome is believed to be of myofascial in origin. Treatment starts with conservative pharmacotherapy (with non-steroidal anti-inflammatory drugs, muscle relaxants and neuropathic pain agents) and continues with physical therapy (stretching of the muscle). When conservative regimen fails, then injection of local anesthetic with steroid of piriformis muscle is given to break the trigger point to relieve the patient’s pain. To increase the reliability of the injections, various methods such as nerve stimulator technique, electromyography, fluoroscopy, computed tomography, magnetic resonance imaging and ultrasound have been described as a guide for infiltration of the piriformis muscle. In this study we see the efficacy of fluoroscopy and nerve stimulator guided piriformis injection for management of piriformis syndrome.

Aim of investigation:
Aim of the study is to assess the role of Fluoroscopy and nerve stimulator guided piriformis injection with local anesthetic with steroid for management of piriformis syndrome.

Methodology:
Inclusion criteria
1. Age: 18 – 70 years
2. Pain: unilateral hip and/or leg pain with positive FAIR (flexion, adduction, internal rotation) test, Pace sign, Freiberg’s sign.
3. Tenderness and/or trigger point at the Piriformis Muscle.
4. Unresponsive to conservative treatment

Exclusion criteria:
1. Neurological deficiency
2. History of allergic reaction to the drug and contrast agent
3. Coagulopathy or infectious disease or any systemic illness

5. Pregnancy.

With ethical permission and informed written consent from the patients total 30 patients of piriformis fulfilling the inclusion and exclusion criteria were given piriformis injection with 5ml of 0.25% bupivacaine and 40 mg methyl prednisolone by the help of fluoroscopy and nerve stimulator both. Pain in Neumeric Rating Scale (NRS) and Disability by Ronal Moris Questionnaire was recorded for all the patients before the procedure, 1 hour, 1 week and 3 weeks after the procedure. All the data were statistically analyzed.

Result:
It was found that pain score and back disability score decreased significantly after the injection and the effect was also sustained after 3 weeks.

Conclusion:
Injection of local anesthetic along with steroid in piriformis muscle by fluoroscopy and nerve stimulator guidance, followed by physiotherapy is an effective treatment for piriformis syndrome.

Conflict of interest: NIL
Financial support: NIL
BILATERAL ULTRASOUND GUIDED ERECTOR SPINAЕ PLANE (ESP) BLOCK FOR POST OPERATIVE ANALGESIA IN LUMBAR SPINE SURGERY - A CASE SERIES

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Paper Id: ISSP025

Summary

Posterior spinal fusion surgery is associated with severe post operative pain with marked analgesic usage, extended length of hospital stay and significant morbidity. The ESP block is a novel ultrasound guided regional anesthetic technique involving deposition of local anaesthetic into the musculofascial plane between the erector spinae muscle and transverse process targeting the ventral rami, dorsal rami and rami communicantes of spinal nerves. This block has been shown to provide good post operative analgesia for thoracic, breast and abdominal surgeries. As there is paucity of literature regarding the efficacy of ESP block as a post operative analgesic method in posterior spine fusion surgeries, with the present case series we are interested in exploring its efficacy in lumbar spine surgeries.

Aim

Our primary aim was to evaluate the NRS pain scores at various time intervals upto 24 hours post operatively and time to rescue analgesia.

Method

We are reporting a series of 5 cases who underwent posterior lumbar spinal fusion surgery. Ultrasound guided bilateral ESP block with 20 ml 0.2% Ropivacaine on each side was given in prone position at either L2 or L3 level after induction of general anaesthesia with a curvilinear transducer (2-5MHz). Surgeries lasted for 2.5-3 hours, patient’s hemodynamics were monitored and were stable throughout. Post operatively pain scores were measured using NRS every 2 hours till 12 hours, then every 4th hourly till 24 hours.

Result

All 5 patients had significantly low scores on NRS between 2-3 in the first 6-8 hours post operatively. After that the pain scores raised significantly and patients were given first dose of rescue analgesia (1 g Paracetamol IV) on demand.

Conclusion - ESP block has emerged as an effective novel regional technique with less analgesic requirements along with simplicity and safety for patients undergoing posterior spine fusion surgery. Since the literature is very scarce, further more studies are required to validate its results.

Disclosures - No conflicts of interest.
EVALUATION OF EPIDURAL BUPIVACAINE AND ROPIVACAINE FOR POST-OPERATIVE DYNAMIC PAIN RELIEF IN PATIENTS UNDERGOING UPPER ABDOMINAL SURGERY: A RANDOMIZED TRIAL

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Paper Id: ISSP026

Summary
Optimal dynamic pain relief is a prerequisite for early postoperative recovery; ensuring normal pulmonary functions including ventilation, coughing, and mobility. Among the most commonly used pain relieving techniques for post-operative pain, epidural analgesia is most effective in providing dynamic pain relief after major surgical procedures.

Aim
The aim of this prospective, double-blind, randomized trial was to evaluate epidural bupivacaine and ropivacaine for post-operative dynamic pain relief in patients undergoing major upper abdominal surgery.

Methods
Sixty patients undergoing major upper abdominal surgery under general anaesthesia and thoracic epidural analgesia (T8-9 or T9-10 interspace) were randomly allocated into two groups; Group Ropivacaine: 0.1% epidural ropivacaine with 2μg/ml fentanyl @ 7ml/hr; Group Bupivacaine: 0.0625% epidural bupivacaine with 2μg/ml fentanyl @ 7ml/hr. Primary outcome was dynamic pain as assessed by Visual analog scale (VAS) scores (at deep breathing, coughing, rising from supine position) and secondary outcomes were the side effects, assessed till morning of third post-operative day. Results were analyzed by one way ANOVA, Mann Whitney U test and Fisher’s exact test. P value <0.05 was considered significant.

Results
The two groups were similar with regard to demographics and dynamic pain VAS scores during deep breathing, coughing and rising from supine position. Mean Systolic blood pressures were lower in the bupivacaine group during the first 24 hours as compared to the ropivacaine group (P>0.05); motor blockade in lower limbs was recorded in one patient in bupivacaine group; PONV was present in two patients in bupivacaine group and four
patients in ropivacaine group; no other side effects were recorded; these differences were not significant.

**Conclusion**
The bupivacaine and ropivacaine provided similar pain relief during deep breathing, coughing and rising from supine position; the incidence of side effects was found to be higher with bupivacaine but the difference were not significant.
ASSESSMENT OF EFFICACY OF TRANSFORAMINAL EPIDURAL STEROID INJECTION FOR MANAGEMENT OF CHRONIC LOW BACK PAIN WITH UNILATERAL RADICULOPATHY IN INDUSTRIAL WORKERS: A RANDOMIZED CONTROL TRIAL

Author: Dr. Piyali Mondal, Eipm
Co-Author(s): Dr. Subrata Goswami
Paper Id: ISSP027

Objective:
To compare the efficacy and outcome of transforaminal epidural steroid injection by gait analysis, pain and disability measurements.

Methods
60 patients aged between 18 to 60 years who attended pain clinic with complains of low back pain with unilateral radiculopathy in ESI Hospital, Kolkata, were included for this randomised controlled trial. LBP was diagnosed due to lumber disc herniation. Patients were divided into 2 groups (30 patients in each group); Group I: was received anti neuropathic medications eg, tab Gabapentin, tab Amitriptyline and Spinal extension exercises and single transforaminal epidural steroid injection with deposteroid (20mg) and 0.25% bupivacaine. Group II: Control group was received anti neuropathic medications and exercises. Each patient was followed up for 1 month.

Results
In group I, changes in mean of numerical rating scale for pain intensity measurement between visit 1 and 2 is -4.19 and in group II, -1.10. But in both groups, p value is < 0.001. In group I, changes in means of modified Oswestry disability index scores between visit 1 and 2 is -27.58 and in group II, -4.65 and p value is < 0.001 in between 2 visits in both group. In group I, changes in means of pelvic angle measurement of affected limb between visit 1 and 2 is -7.20 and in group II, -1.70. But in both groups, p value is < 0.001 in between 2 visits.

Conclusion
Transforaminal epidural steroid injection along with exercise and medications cause a significant improvement in gait analysis in unilateral radiculopathy after 1 month along with NRS of pain measurements and modified Oswestry disability index scores.
A PROSPECTIVE COMPARATIVE STUDY TO EVALUATE THE EFFICACY OF INTRAPERITONEAL NEBULISATION WITH ROPIVACAINE VERSUS ROPIVACAINE AND NALBUPHINE FOR POSTOPERATIVE ANALGESIA IN LAPAROSCOPIC CHOLECYSTECTOMY USING ÄEROGEN PRO* ULTRASONIC NEBULIZER.

Author: Dr. Abullais Raheeq Gowda, ALL INDIA INSTITUTE OF MEDICAL SCIENCES, RISHIKESH

Co-Author(s): Nishith Govil

Paper Id: ISSP028

SUMMARY
Intraperitoneal administration of local anaesthetics with opioid and nonopioid substances has been used to provide pain relief with variable success. This randomized double blinded placebo controlled study is designed to study the effect of intraperitoneal nebulisation of Ropivacaine (0.75%) with and without Nalbuphine (1%) using AEROGEN-Pro ULTRASONIC NEBULISER, on postoperative Pain and Opioid requirement after laparoscopic cholecystectomy

AIM
To assess the efficacy of intraperitoneal ropivacaine nebulization with and without nalbuphine on postoperative pain relief and opioid consumption after Laparoscopic Cholecystectomy

Materials and Methods
90 patients (ASA I and II posted for Laparoscopic Cholecystectomy) were randomized to receive 8ml of normal saline (group P), 7ml of 0.75% ropivacaine with 1ml of normal saline (group R) and 7ml of 0.75% ropivacaine with 0.1mg/kg of 1% nalbuphine (group RN) intraperitoneally by nebulisation. VAS scores assessed immediately after shifting the patient to postanaesthesia care unit (PACU) after surgery 0 hours, and thereafter at 1/2, 1, 2, 4, 8, 12 and 24 hours postoperatively. Rescue analgesia given with inj. Fentanyl 1 mcg/kg iv if VAS > 4/10. adverse effects noted were nausea, vomiting, hypotension, bradycardia, respiratory depression/hypoventilation, pruritis. Statistical analysis performed with ANOVA. P<0.05 considered significant.

Results
VAS was maximum in placebo (group P) than in ropivacaine alone (group R), least in ropivacaine with nalbuphine at time intervals upto 4 hours (group P> group R> group RN) except at 0 hours when VAS score was similar between group R and group RN. There was
no significant statistical difference between VAS scores of all 3 groups after 8 hours. Between 4 and 8 hours, VAS score was as follows: group P > group R = group RN. VAS scores were higher in all groups at all points of time in case of intraperitoneal billiary spillage, hence such subjects excluded from the trial (n=9). In group RN, 1 patient was drowsy till 4 hours and 2 patients had 2 episodes of vomiting each in first 4 hours of postoperative period.

**Conclusion**

Intraperitoneal nebulisation of ropivacaine with nalbuphine (0.1 mg/kg) is not significantly superior to ropivacaine alone, without any significant adverse effects of nalbuphine.
Summary
Storytelling is a method of improving communication between children and healthcare clinicians. For the estimated one in every ten children who experience chronic pain at some time, medical experiences can be a frustrating and frightening process. Many children with chronic pain feel excluded from decisions over their care, which compounds emotional distress. Storytelling has the potential to change that. Children’s stories offer a unique insight into how children think and feel about their pain. Patient centred healthcare in medicine is still often based upon the paternalistic assessment of the clinician as to ‘what is best for the patient’. The practical danger is that doctors try to impose health states rather than listen to a patient’s own evaluation. This can lead to flawed judgements and significant trauma to the patient when things go wrong.

This paper discusses how an innovative storytelling program utilises digital technologies to improve patient-clinician communication and give children a voice. Storytelling provides a fun, low cost method of giving children some control over the narrative of their pain. Analysing the impact of children’s stories on doctors may offer insight into providing more effective management strategies for chronic pain in children.

Aim of Investigation
Analyse the impact of children’s stories on healthcare professionals.

Methods
Children aged 5-11 years old with chronic pain participate in 6 storytelling sessions with a professional storyteller. Children produce a digital story film using the voice of a character they invent. Doctors attend a focus group to watch films and give feedback on how children’s stories may impact their practice.

Results
Initial findings from this study are:
• Doctors are open to the idea of anything that helps patients and makes their job easier. Pain consultants are enthusiastic about the potential of new tools to help manage child pain.
• Children enjoy telling stories about their experiences. They believe their voices are important.
• Families appreciate the opportunity for their ‘kids to be kids’ participating in an enjoyable activity.

Conclusions
Storytelling empowers children to tell their own stories. This gives children back some control over the narrative of their pain, with the potential to boost mental wellbeing as a result. Clinicians who listen to patient stories potentially gain greater insight and understanding into the patient’s overall health situation. Greater insight can improve communication with patients and lead to better health outcomes.
A COMPARATIVE STUDY OF EPIDURAL STEROID WITH LOCAL ANAESTHETIC AND ONLY LOCAL ANAESTHETIC INJECTION IN MANAGEMENT OF CHRONIC LOW BACK PAIN DUE TO HERNIATED DISK: A PROSPECTIVE RANDOMISED CONTROLLED TRIAL

Author: Dr. Gargi Nandi, ESI Institute of Pain Management
Co-Author(s): Dr Subrata Goswami
Paper Id: ISSP030

SUMMARY
Chronic low back pain (LBP) is the most common source of pain and disability in modern society. There are different pathophysiology for low back pain due to herniated disk –
1. Nerve root impingement due to herniated disk
2. Different proinflammatory chemical agents, causes ectopic neuron firing and trigger pain.

AIM OF THE INVESTIGATION
To study the efficacy in pain relief and improvement in functional disability by administrating epidural steroid with local anaesthetic and only local anaesthetic injection in chronic low back pain due to herniated disk.

METHODS
PLACE OF STUDY - pain OT of ESI institute of Pain Management
INCLUSION CRITERIA
1. Patients suffering from low back pain due to herniated disk with or without radiculopathy
2. Patient aged between 20-60 years
3. Duration of low back pain more than 12 weeks
4. Patient taking antineuropathic medicine more than 4 weeks
5. Degree of pain more than 5 according to numeric rating scale

EXCLUSION CRITERIA
1. Patients presenting with a cauda equina syndrome, severe paresis, severe pain
2. History of trauma, spinal injection or surgery, deformity, pregnancy, ongoing breast feeding, warfarin therapy
3. Ongoing treatment with non-steroidal anti-inflammatory drugs Body mass index of more than 30
4. Poorly controlled psychiatric conditions with possible secondary gain or severe comorbidity.
5. severe intraspinal pathology (large disc herniations occupying more than 50% of the spinal canal,
spinal stenosis, tumours, bleeding, dural fistula, synovial cysts, or dysraphia).

6. Patients not giving consent

**SAMPLE SIZE**

It is estimated that 20 subjects would be required per group.

Group-S patients received 9 ml of 0.25% bupivacaine and 1ml (40 mg) methylprednisolone acetate.

Group-L patients received 10 ml of 0.25% bupivacaine.

**RESULTS**

The patients in the two groups were comparable for age, male: female ratio and the difference between the two groups was not statistically significant ($P > 0.05$).

NRS is not statistically significant between the two groups prior to the injection and at 1 week, 4 weeks and 6 weeks after injection.

RMDQ is not statistically significant between the two groups prior to the injection and at 1 week and 6 weeks after injection. It is statistically significant only at 4 weeks after the injection.

**CONCLUSION**

Improvement during the follow-up period was found in both the groups. But there is no significant difference in NRS and RMDQ in the local anaesthetic only group with local anaesthetic with steroid group.
COMPARISION OF CLONIDINE AND DEXMEDETOMIDINE AS ADJUVANTS FOR ROPIVACAINE IN SUPRACLAVICULAR BRACHIAL PLEXUS BLOCK

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Co-Author(s): Amit Khatuja, Rajesh Misra
Paper Id: ISSP033

Background
Addition of adjuvants to local anaesthetic in supraclavicular brachial plexus block helps in improving duration of block and analgesia. We compare clonidine and dexmedetomidine as adjuvants to ropivacaine in supraclavicular brachial plexus block.

Method
A total of 75 patients aged from 20 to 60 years belonging to ASA I-II scheduled for upper limb surgery were included and divided into three groups Group I – Group I received 0.5% Ropivacaine plus normal saline, Group II received 0.5% Ropivacaine plus Clonidine and Group III received 0.5% Ropivacaine plus dexmedetomidine. The patients were compared for onset as well as duration of sensory and motor blockade, duration of analgesia and haemodynamic side effects.

Results
The mean duration of sensory and motor block as well as analgesia was found to be more (statistically highly significant p<0.001) group III (Dexmedetomidine group) having a much longer duration of sensory and motor block as well as analgesia compared to group I (plain ropivacaine) and group II (Clonidine group).

Conclusion
Therefore, in present study it was found that addition of clonidine and dexmedetomidine to 0.5%ropivacaine are effective in supraclavicular brachial plexus block. However, dexmedetomidine is a better alternative to clonidine as adjuvant for 0.5% ropivacaine in supraclavicular brachial plexus block to obtain early onset and prolonged the duration of sensory and motor block and postoperative analgesia.
PRFA ADJACENT TO LUMBAR DRG FOR BONE METASTATIC CANCER PAIN PATIENTS -
A CASE SERIES.

Author: Dr. Bables Mahawar, RAJIV GANDHI CANCER INSTITUTE & RESEARCH CENTRE

Summary

Metastatic bone pain is among the most commonly reported pain conditions in cancer patients
and conservative management frequently fails to provide satisfactory pain relief. Pulsed
radiofrequency ablation (PRFA) is a minimally invasive and an effective alternative procedure
in the palliative treatment of symptomatic bone metastases in regard to pain reduction, safety, and
quality of life where conventional treatment with radiation, chemotherapy, and treatment with
analgesics had failed to reduce the pain efficiently. However, there is paucity in the literature
evaluating the efficacy of PRFA treatment for metastatic pain.

Case 1
A male patient, 58 years of age, case of Ca lung with lytic erosion on medial aspect of right
femoral neck with cortical thickening on MRI, complaints of pain in right buttock and groin
radiating to anteromedial aspect of thigh till knee. Surgery was not contemplated in view of
delayed recovery and shorter life span. PRFA L2, L3 DRG was done.

Case 2
Non small cell lung carcinoma with L4 vertebral metastasis, thus retropulsion led to the compression
of L4, L5 nerve root causing back, hip and leg pain on the affected side. PRFA of L4, L5 DRG was
done.

Case 3
Ca lung with impending fracture femur post interlocking, complaints of persistent pain in groin
radiated to anteromedial aspect of thigh. L2, L3 PRFA done.

AIM OF INVESTIGATION

The aim of the study is to determine the efficacy of PRFA of lumbar DRG in the palliative treatment
for bone metastases in regard to pain reduction, safety, and quality of life.

METHOD

Over a period of 4 months, PRFA was performed in three patients. Pain was measured with the
Numerical rating scale (NRS 0 to 10) one day before PRFA was performed under fluoroguidance
and daily for a month after release from the hospital telephonically, and at the follow-up periods of
1, 3, 6 weeks after PRFA. Additionally, quality of life was self-assessed by the patient via Eastern
Cooperative Oncology Group (ECOG) scale at each follow-up. The patient’s analgesics use was
also recorded at the follow-up intervals and complications were monitored. No serious
complications were observed.

RESULT

Pain score reduced more than 50% with marked improvement in their performance status from
ECOG- 3/5 to 1/5 in first and second case and 2/5 in third patient.

CONCLUSION
PRFA of selective lumbar dorsal root ganglia is an effective palliative treatment option for treating bone metastatic cancer pain when conservative and palliative radiotherapy options are exhausted.

**DISCLOSURES**
Not applicable
AIM OF INVESTIGATION:
To compare the effect of intraperitoneal instillation of bupivacaine alone to bupivacaine with tramadol or dexmedetomidine for postoperative analgesia in laparoscopic surgeries.

METHODS:
60 elective patients posted for laparoscopic surgeries under general anaesthesia were included in the study.
Patients (n= 60) were randomly divided into three equal sized study groups.
Group B – Received intraperitoneal Bupivacaine 50 ml 0.25% + 5 ml normal saline (NS)
Group BT – Received intraperitoneal Bupivacaine 50 ml 0.25% + Tramadol 1 mg/kg (diluted in 5 ml NS)
Group BD – Received intraperitoneal Bupivacaine 50 ml 0.25% + Dexmedetomidine 1 µg/kg (diluted in 5 ml NS)
The drug was injected at the end of the surgery intraperitoneally before the removal of trocar.
The quality of analgesia was assessed by visual analogue scale (VAS). Time to the first request of analgesia, total dose of analgesic in the first 24 h and adverse effects were noted. Statistical analysis was performed using Microsoft (MS) office Excel software with the Student’s t-test and Chi-square test (level of significance P = 0.05)

RESULTS:
VAS at different time intervals, overall VAS in 24 h was significantly lower (1.80 ± 0.36, 3.01 ± 0.48, 4.5 ± 0.92), time to first request of analgesia (min) was longest (128 ± 20, 118 ± 22, 55 ± 18) and total analgesia consumption (mg) was lowest (45 ± 15, 85 ± 35, 175 ± 75) in Group BD than Group BT and Group B.

CONCLUSION:
Intraperitoneal instillation of bupivacaine in combination with dexmedetomidine is superior to bupivacaine alone and may be better than bupivacaine with tramadol.

SUMMARY:
Laparoscopic surgery is associated with considerable pain in the postoperative period. Given the expanding role of ambulatory surgery and need to facilitate an earlier hospital discharge, improving postoperative pain control has become an important issue for all the anaesthesiologists. Intraperitoneal local anaesthetic instillation is an effective, cheap and noninvasive method for early post op pain relief in laparoscopic surgeries. Both intraperitoneal bupivacaine 50ml 0.25 % + tramadol 1mg/kg (diluted in 5ml NS) and intraperitoneal bupivacaine 0.25 % + dexmedetomidine 1µg/kg (diluted in 5ml NS) are equally effective in postop pain relief up to 12 hour duration. In view of post operative analgesia beyond 12 hours and lesser need for rescue analgesia with respect to Tramadol, intraperitoneal instillation of Dexmedetomidine provides an excellent alternative for intraperitoneal analgesia in laparoscopic surgeries.
PATIENT SATISFACTION WITH ACUTE PAIN SERVICES (PASAPS)
Author: Dr. Sayandeep Mandal, TATA MEDICAL CENTER, KOLKATA
Co-Author(s): Dr. Jyotsna Goswami, Dr. Neha Desai
Paper Id: ISSP037

SUMMARY
Pain is an expected part of postoperative course and effective pain control is the part of the anesthesia care, which is often underestimated and undertreated. Poor postoperative pain management can lead to significant negative clinical and psychological outcomes with an increase in morbidity, mortality and healthcare costs and decreased quality of life. Hence patient satisfaction becomes an important determinant of the quality of healthcare. About 50 patients undergoing all types of surgery at the center over a period of 6 months will be recruited in the study. The variables affecting patient satisfaction such as measures of analgesia, patient factors, type of surgery used will be assessed and evaluated. This study will provide input for the scope of further improvement in the pain management services.

AIMS:
Primary: To assess patients’ satisfaction to pain relief after major surgeries with different modes of analgesia used
Secondary: To identify different variables affecting patient satisfaction:
1. Patient-related factors i.e.
   a. age,
   b. gender,
   c. education and
   d. ASA-PS status
2. Surgery-related factors i.e.
   a. type (Elective/emergency) and
   b. site of surgery

METHODS
Site of Study: OT complex and Intensive Care Unit, Department of Anesthesiology & Critical Care, Tata Medical Center, Kolkata.
Type of Study: Questionnaire based cross-sectional analysis.
Population: All patients undergoing surgery at Tata Medical Center will be recruited on POD-2 for the study.
Inclusion criteria:
1. Patients above 18 years of age
2. Able to read/write English/Bengali/Hindi
Exclusion criteria:
After explaining the study protocol to all patients in their language, a written informed consent will be obtained from all patients.

The questionnaire:
The revised American Pain Society, the Patient Outcome Questionnaire (APS-POQ) adapted for the present study, originally in English language, along with its translated form in Hindi and Bengali, will be used for collection of the data.

Duration of study: 6 months
Number of Patients: 400

RESULT AND CONCLUSION
1 month data will be analyzed statistically and presented during the presentation.
TO EVALUATE THE EFFICACY AND SAFETY OF TRANSDERMAL BUPRENORPHINE PATCH FOR IMMEDIATE POST-OPERATIVE ANALGESIA FOLLOWING TOTAL KNEE REPLACEMENT SURGERY

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Paper Id: ISSP038

Background:
Transdermal buprenorphine, widely used in chronic pain management has been rarely studied in acute postoperative setting. The purpose of this study was to compare the safety and efficacy of transdermal buprenorphine patch to conventional analgesics following knee replacement surgery.

Methodology:
200 adult patients aged 60-75 years undergoing unilateral or bilateral TKR surgery under neuraxial anesthesia were included in the study. Group A received transdermal buprenorphine patch 5mg applied at end of surgery. Group B received a combination of paracetamol and tramadol in recommended doses. In addition, all patients received periarticular infiltration intra-operative and continuous epidural/femoral nerve block infusion for 72 hours post-operative. IV diclofenac was used as rescue analgesia when required. Pain scores were recorded at rest and on movement using NRS score over 7 days and side effects if any were noted.

Results:
Both groups were comparable in all respects. Pain scores at rest and on movement were significantly lower in group A. Rescue analgesia requirement was also significantly less in this group. Only one patient in group A had clinically significant respiratory depression and 3 patients had local erythema.

Conclusion:
Transdermal buprenorphine patch can be safely used for post-operative analgesia and is more efficacious in reducing immediate post-operative pain after TKR surgery with fewer systemic & organ related side effects like hepatotoxicity or nephrotoxicity when compared to conventional analgesics.
Robot assisted CT guided Celiac Plexus Neurolysis Technique and Outcomes: SGPGI Experience

AIM:
To report our experience of Robot assisted CT guided Celiac Plexus Neurolysis (CPN) for intractable abdominal pain in upper abdominal malignancy patients.

METHODS:
We analyzed patients with advanced upper abdominal malignancy undergoing treatment in our palliative care outpatient department having a Visual Analog pain score ≥4 poorly controlled with oral morphine. These patients underwent Robot assisted CT- guided Celiac plexus Neurolysis (CPN) with ethanol via posterior unilateral antecrural technique. Post procedure pain relief and oral morphine intake were assessed during a 3 month follow up period. Patients who died or lost during follow up were also noted. All minor and major complications were recorded during or after procedure.

RESULTS:
10 patients were enrolled. CPN procedure was completed successfully in 9 patients using Robot CT guidance with single puncture in 4 patients. Double puncture was done in 5 patients on account of inadequate spread of dye. Procedure was abandoned in 1 patient due to difficulty in prone positioning. Pain relief was defined as Visual Analog Score (VAS) < 3 post CPN. At 1, 2 and 3 month follow up pain relief was observed in 6 of 9 (66.7%), in 4 of 8 (50 %), in 2 of 6 (33.3%) patients respectively (P value <0.05). One patient was lost to follow up at 1 month and 2 patients underwent death at 3 month follow up. Oral Morphine intake decreased at 1, 2 and 3 month follow up (P value 0.006, 0.010, 0.023 respectively) as compared to the baseline. 6 Minor complications including diarrhea (1 of 9, 11.1%), orthostatic hypotension (2 of 9, 22.2%) and local backache (3 of 9, 33.3%) and no major complications occurred.

CONCLUSION:
Robot assisted CT guided CPN appears to be a safe and effective technique for palliative pain management in cancer patients.

LIMITATION:
Performer’s learning curve for robot assistance and limited enrollment of patients provided inadequate power to draw firm conclusions.

ACKNOWLEDGEMENT:
We thank Department of Nuclear Medicine SGPGI for assistance with Robot CT guided Celiac Plexus Neurolysis and Dr. Sanjay Gambhir for comments that greatly improved the technique and outcomes.
ERECTOR SPINAES BLOCK FOR ENHANCED RECOVERY AFTER SURGERY

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Co-Author(s): Dr Radhika Dhanpal, Dr Sampreeta

Paper Id: ISSP040

Postoperative pain following abdominal surgeries is quite severe. It may not always be feasible to place epidural catheter. Multimodal analgesia necessitating high opioid doses may cause drowsiness, respiratory impairment, nausea and vomiting delaying recovery. Ultrasound guided erector spinae block (ESP) is a good truncal interfacial block in thoracic and abdominal surgeries enhancing early recovery.

The aim of this study is to report three cases of ESP block for abdominal surgery. The first patient was 58 year old female posted for right laproscopic nephrectomy for non functional right kidney. Preemptive ESP block under ultrasound guidance was administered at the transverse process of T11 vertebra with the patient in left lateral decubitus position. 20 ml of 0.5% bupivacaine was used. Our second patient was a 63 year old female patient posted for open cholecystectomy for chronic calculi under general anaesthesia. She received preoperative ultrasound guided bilateral ESP block in the sitting position. 15 ml of 0.5% bupivacaine with 4mg dexona was deposited between the erector spinae muscle and transverse process of T7 vertebra on each side. Next patient was a 58 year old male diagnosed with horse shoe kidney and staghorn calculus posted for right percutaneous nephrolithotomy. Preemptive right ESP block was administered with 20 ml 0.5% bupivacaine at T9 level.

All patients received intravenous fentanyl 100 microgram, propofol 2mg/kg and atracurium 0.5mg/kg for induction. After intubation, anaesthesia was maintained with sevoflurane 0.6 minimum alveolar concentration in air-oxygen mixture and atracurium. Patients were hemodynamically stable intraoperative. All three patients did not receive any further opioids. Surgeries were uneventful. They were extubated postoperatively and were shifted to postanaesthesia care unit (PACU). Once fully awake pain was assessed. The resting numerical rating scale(NRS) was 1-2/ 10 in all three patients. All three patients were discharged from PACU in an hour and sent home within 24 hours.

ESP block provides extensive potent analgesia. Local anaesthetic is deposited in the plane between the erector spinae muscle and transverse process of vertebra. The efficacy of the block is due to the diffusion of local anaesthetic into the paravertebral space through the costotransverse foramina. Both the dorsal and ventral branches of the thoracic spinal nerves are affected by the
drug. The extensive craniocaudal diffusion of anaesthetic allows wide coverage with a single injection. Our experience shows a good analgesia achieved with preemptive ESP with early recovery and ambulation.
AIM OF INVESTIGATION:
To compare the effects Fentanyl and Dexmedetomidine as an adjuvant to Ropivacaine for brachial plexus block. The effects were studied in terms of
a) Onset of sensory blockade and motor blockade
b) Duration of analgesia / first request for analgesic
c) Duration of motor blockade
d) Complications / side effects if any

METHODS:
◦ After obtaining the institutional ethics committee clearance, the study was undertaken during the period Dec 2016 May 2018.
◦ A total of sixty patients were included in the study, thirty patients in each group.
◦ The subjects were randomly allocated into two groups:
  1. Group RF: Received 0.5% ropivacaine 30 ml with 50 mcg of inj.Fentanyl.
  2. Group RD: Received 0.5% ropivacaine 30 ml with 50 mcg of inj.Dexmedetomidine
◦ Patients were randomly allocated in this double blind study into two groups.
◦ Neural localization was achieved by using a nerve locator connected to a 22 G needle. The location end point was a distal motor response with an output lower than 0.5 mA in the median nerve region.
◦ 30mL of a solution containing local anaesthetic combined with fentanyl or dexmedetomidine as mentioned above was injected. During injection of the drug solution, negative aspiration was done every 5 ml to avoid intravascular injection. A 3-min massage was performed to facilitate an even drug distribution.

RESULTS:
The baseline haemodynamic parameters were comparable in two groups. Mean arterial blood pressure & Heart rate were found to be lower than baseline from 30 to 120 min in Group RD as compared with Group RF. No treatment was required for this fall in blood pressure heart rate.
Among Group RD and Group RF, the fastest onset of sensory and motor block was seen with Group RF. But there was no significant difference among two groups in the time for onset of sensory block and motor block.

- The total duration of sensory block and motor block was significantly prolonged in Group RD (517.90±15.91, 496.86±17.85) compared to Group RF (455.43±11.59, 437.00±11.96)
- The total duration of analgesia was significantly increased in Group RD (28/2/0/0) compared to Group RF (24/5/1/0)

**CONCLUSION:**

- Both dexmedetomidine and fentanyl improves readiness for surgery but dexmedetomidine prolongs the duration of sensory and motor block and postoperative analgesia as compared with fentanyl when used as an adjuvant to ropivacaine in supraclavicular brachial plexus block without any significant side effect.
- The added advantage of conscious sedation, hemodynamic stability, and minimal side effects makes it a potential adjuvant for nerve blocks.
HIP ARTICULAR BRANCH (PENG) BLOCK FOR HIP FRACTURE ANALGESIA- A MULTICENTRE PROSPECTIVE CASE SERIES.

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Paper Id: ISSP042

Introduction and Aim of the Study:
Regional blocks, like Femoral nerve block (FNB) or Fascia iliaca compartment block (FICB) have been in use to provide analgesia in hip fracture patients. They provide modest analgesia, and Obturator nerve (ON) is not consistently blocked with FICB. Recently, there was a publication on Hip articular branch blocks (PENG) where the authors injected local anesthetic at specific targets described by the same group targeting the FN, and accessory obturator nerve. We proposed to carry out similar study and see if this new block provides effective analgesia.

Material and Method:
Ours was a multicentre prospective clinical case series performed at Health World Hospital, Durgapur, Tata Motors Hospital, Jamshedpur and B.R.D Medical College Hospital, Gorakhpur. We included patients who had hip fracture with Visual analogue pain score (VAS) ≥ 5 despite getting intravenous opioid. Patients with coagulopathy, allergy to planned drugs, and those who refused spinal anesthesia (SA) were excluded from the study. All demographic data, and pre-block VAS at rest, and 15 degrees passive straight leg-raise (SLR) was recorded. Written informed consent were taken from all the patients. The procedure was done as per the technique described in PENG block paper. The sonoanatomy revealed Anterior inferior iliac spine, Iliopubic eminence (IPE), Iliopsoas tendon (IPT) and femoral vessels superficially. The block needle was inserted in-plane from lateral to medial and the tip was kept at the midpoint of AlIS and IPE, below the IPT. Subsequently, 20 ml of 0.25% Bupivacaine with 8 mg Dexamethasone was injected. Then, VAS at rest and 15 degrees SLR was measured after 30 minutes. Subsequently, patients were taken to OT for SA. We measured the ease of positioning (sitting) for placement for SA, which was done by another Anesthesiologist who did not perform the block. This was graded as: 0- not satisfactory, 1- satisfactory, 2- good, 3- optimal. At 24-hours following the block, we also asked the patients about their feedback on this block: 1- good, if necessary, will repeat; 2- bad, will never opt for it.
Result:
We performed this block in 20 patients. The pre-block median VAS at rest and SLR were 8, and 10 which got reduced to 1 and 2 respectively at 30-minutes. Fifteen patients (75%) positioned optimally as interpreted by another anesthesiologist who performed SA. At 24-hours post-block, 65% reported that they will prefer the same block if the need arises. There was no significant side effect from the block.

Conclusion:
This new hip articular block seems very promising in providing effective analgesia and helps in positioning the patient for providing spinal anesthesia. However, there is need to carry out proper trial comparing this block with other standard blocks like FNB or FICB.
Introduction and Aim of the Study:
Traditionally, fluoroscopy has been used by Pain Physicians to perform interventional pain procedures. However, in recent times, Ultrasound (USG) usage in performing interventional pain management (IPM) have increased significantly. Unfortunately, there is no Indian data with regards to USG use by Indian Pain Physicians for IPM. Hence, the Musculoskeletal (MSK) pain Special interest group (SIG) of ISSP decided to conduct a survey among Indian Pain physicians to assess current trend on various aspects of USG in IPM.

Material and Method:
The MSK Pain SIG of ISSP made a set of questionnaires and the same was sent to ISSP members. The survey questionnaires were sent by email to 1010 members with active email id in the database. The members were reminded of the survey one more time by repeat email. The questionnaires mainly included USG availability at workplace, training received for USG-guided IPM, barriers to USG use, and suggestions to improve widespread USG use.

Result:
The response rate was only 13% (131 responded out of 1010 physicians). Majority (70%) of the respondents used both USG and fluoroscopy, whereas 3.1% respondents did not use any imaging for IPM. USG machine was available in 78.5% places, whereas 80% respondents had training for USG guided IPM. Interestingly, 54.2% felt they didn’t get adequate training for USG-guided IPM during their pain fellowship or training period. 82.4% respondents said that their best source of USG learning was through cadaveric or hands-on training courses followed by internet and journal or books. PCPNDT law was a major obstacle for universal USG learning according to 67.2% respondents. 80.9% made it a point that there is urgent need to dilute the PCPNDT law and make universal and easy availability of USG machine. At the same, two-third of respondents suggested that ISSP should
conduct workshops regularly and make mandatory USG training in IAPM accredited fellowship centres.

**Conclusion:**
This survey is first-of-its kind and provides many valuable insights on USG availability, training, usage and measures for future widespread use among Indian Pain physicians. However, the response rate is poor (around 13%) and it is difficult to generalize the data. Though 80% respondents had training for USG-guided IPM, 54.2% felt that the training was not adequate. Many respondents suggested for more hands-on courses for further USG learning.
CAN GENICULAR BLOCK PROVIDE ADEQUATE ANALGESIA IN TOTAL KNEE REPLACEMENT?

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Paper Id: ISSP044

Introduction and Aim of the Study:
Total Knee Replacement (TKR) is associated with significant postoperative pain, and regional analgesia techniques play a great role in providing optimal pain relief. Traditionally, femoral nerve block (FNB), Adductor canal block (ACB), or even epidural analgesia are used in addition to systemic analgesia for postoperative pain management (POPM) following TKR. In recent times, specific articular branches known as Genicular nerves (GN) supplying the knee joint have been used as targets for blocks and ablation to provide long lasting pain relief in chronic knee osteoarthritis patients. We hypothesized that GN block (GNB) will provide adequate pain relief following TKR.

Material and Method:
A 63-year gentleman who had his left side TKR done under spinal anesthesia and ACB, now, came for right side TKR. We discussed with him about GNB including benefit and risks, and he agreed to undergo GNB as POPM technique for his right TKR. Under strict asepsis, GNB was done at 3 locations, i.e. superomedial, superolateral, and inferomedial locations of condyle-shaft junction as described previously. Under Ultrasound guidance, we injected 2 ml 0.5% Bupivacaine with 2 mg of dexamethasone at each 3 locations. Then, spinal anesthesia was given with 15mg of Bupivacaine heavy and 100 mcg of Morphine. Intraoperatively, patient received local infiltrative analgesia (LIA) by surgeon, i.v. Ketorolac 30 mg, Paracetamol 1 gm i.v. and Morphine 5 mg i.v at the end. POPM was done by Paracetamol 1gm TDS, Ketorolac 30 mg i.v TDS and Tramadol 50 mg i.v. TDS.

Results:
At 6, and 12-hours post-TKR his numerical pain rating (NRS) score at rest was 0 on both occasions. At 6-hours, he was able to extend the knee fully, and stand with support. At 24-hours post-TKR, his NRS at rest and physiotherapy were 4, and 6 respectively. He was able to ambulate with support at 24-hours post-TKR. While at discharge, he informed that he had better pain relief on the side where GNB was done compared to the other side where he received ACB.

Conclusion:
This is the first-ever description of GNB for acute POPM following TKR. It provided very good pain relief and helped in early ambulation. As the injection site is close to the surgical incision, the risk of infection should be communicated to the patient. However, GNB needs to be done in large number of patients to see if this block is helpful in POPM.
"SERRATUS PLANE BLOCK" AN INTERVENTION TO RELIEVE PAIN IN MULTIPLE RIB FRACTURE

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Paper Id: ISSP045

Introduction:
Multiple rib fracture is a notoriously painful condition and associated with high morbidity and mortality. Excruciating pain during breathing due to movement of fractured rib segments can cause hypoventilation and atelectasis. Furthermore, there is retention of secretion as patients are unable to cough because of pain. These factors can lead to the development of pneumonia and respiratory failure if pain is not aggressively treated. Along with pharmacotherapy, invasive techniques like thoracic epidural block, paravertebral block are used to be the mainstay of pain management options in these patients. However, often these procedures are difficult to perform due to associated spine injury, hemodynamic instability etc. Serratus plane block, a recently reported technique has provided good analgesia to the chest wall.

Aim of investigation:
To assess the effectiveness of serratus plane block in unilateral multiple rib fracture patients.

Method:
Serratus plane block was performed in 10 patients with unilateral multiple rib fracture (no. of fractured rib segment 2 or more) after a protocol driven pain assessment. Under ultrasound guidance 40 mls of 0.125% Bupivacaine deposited under the serratus muscle at 5th rib in the mid axillary area and then epidural catheter was tunnelled in the same space for continuous infusion (0.125% bupivacaine at the rate of 1.5 ml per hour). PIC score was monitored before the procedure and after the procedure at 24, 48 and 72 hours. PIC score is a composite score derived from the assessment of dynamic pain (1- controlled pain [VAS 0-4], 2- moderate [VAS 5-7], 3-severe [VAS 8-10]), incentive spirometry (1- above goal level, 2- below goal level, 3- not able to perform) and ability to cough (1-strong, 2-weak, 3-absent). All the patients received intravenous paracetamol and tramadol infusion as a part of multimodal analgesia plan.

Results:
All the 10 patients were male with median age group of 50. The average preprocedure PIC score was 8.5 and post procedure score at 24, 48 and 72 hours were 4.6, 4.2 and 3.3 respectively. Eight out of ten patients did not require tramadol infusion after 24 hours. The average length of stay in ICU was 5.8 days. No patients had developed any respiratory complications during their stay in hospital.

Conclusion:
Serratus plane block is an effective modality in managing pain in multiple rib fracture patient.
COMPARISON OF INTERSCALENE APPROACH BRACHIAL PLEXUS BLOCK WITH INTRAVENOUS DEXMEDETOMIDINE IN ARTHROSCOPIC RECONSTRUCTIVE SHOULDER SURGERIES- A PROSPECTIVE RANDOMIZED STUDY.

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Paper Id: ISSP046

Background:
Shoulder arthroscopy, a major diagnostic and management tool for problems related to shoulder joint has revolutionized shoulder surgeries. But the management of intraoperative hemodynamics and postoperative pain still remains a challenge to the anesthetists. Even though interscalene brachial plexus block is considered gold standard for shoulder analgesia it requires expertise. Hence a prospective randomized trial was done to compare the efficacy of ultrasound guided interscalene brachial plexus block versus intravenous dexmedetomidine infusion which demands lesser level of skills than block.

Material and Methods:
We randomized 48 patients scheduled for elective arthroscopic shoulder surgery into Group BLOCK received ultrasound guided interscalene brachial block with 20ml, 0.25% bupivacaine and into Group DEX received intravenous dexmedetomidine with initial bolus of 0.5mcg/kg over 20 minutes followed by an infusion of 0.5 mcg/kg/hr which was stopped 30 minutes prior to completion of the surgery. Intraoperative hemodynamics, surgeon’s opinion, postoperative analgesia and patient satisfaction were recorded.

Results:
Study was analyzed using composite scores to know the overall quality of anesthesia care. Even though intraoperative hemodynamics, surgeon’s review and recovery time showed no statistically significant difference between the two groups there was a significant difference with respect to immediate post-operative analgesia with better analgesia among Group BLOCK. However overall quality assessment revealed that both the techniques provided very satisfactory experience to the patients.

Conclusion:
From our study we concluded that intravenous dexmedetomidine infusion is an effective alternative for interscalene brachial block as an adjuvant to general anesthesia for reconstructive shoulder arthroscopy.
A COMPARATIVE STUDY OF 0.25% BUPIVACAINE AND 0.25% BUPIVACAINE WITH DEXAMETHASONE FOR ULTRASOUND GUIDED SUPRACLAVICULAR BRACHIAL PLEXUS BLOCK FOR UPPER LIMB SURGERIES IN INDIAN POPULATION

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Co-Author(s): J J Jana
Paper Id: ISSP047

SUMMARY
The following study was conducted at the Department of anaesthesia KEM hospital during the period January to November 2018 to evaluate the effect of adding Dexamethasone to 0.25 % Bupivacaine for Supraclavicular Brachial Plexus Block. The effect was assessed in terms of onset and duration of blockade and requirement of postoperative analgesia.

BACKGROUND AND AIMS
During Regional anaesthesia challenge always remains to increase the duration of the action and effectiveness of the local anaesthetics (LA ). Previously adding adjuvants like epinephrine ,clonidine ,dexmedetomidine , opioids ,ketamine and midazolam to LA s has helped in decreasing postoperative i.v. analgesic requirement but pain relief has still not been satisfactory as these drugs have other adverse effects with limited success rates. Dexamethasone has emerged as a boon with advantage of prolonged action, and cardiopulmonary safety. This study was designed to evaluate the efficacy of ultrasound guided supraclavicular brachial plexus block when Dexamethasone was added to 0.25 % Bupivacaine.

METHODS
60 consecutive patients posted for elective elbow and below elbow surgeries were recruited. They were randomly allocated to one of the two groups by sealed envelope technique. Group A- Patients received 30ml 0.25% bupivacaine + 2 ml of N/S perineurally in the Brachial Plexus using ultrasound guided supraclavicular approach. Group B - Patients received 30ml of 0.25% Bupivacaine+ 8mg (2ml) Dexamethasone perineurally with same approach. Heart rate, NIBP, ECG ,SpO2, onset and duration of sensory and motor blockade and adverse effect, if any ,were assessed. Time to rescue analgesia (VAS scale) was also noted. Statistical tests used were Chi-Square test and Fisher’s exact probability test. The entire data was analysed using SPSS version 21.0.

RESULTS
The distribution of mean onset of sensory blockade (in mins) was significantly earlier in Group B(19.85 ±1.83) compared to Group A(22.90 ± 1.79) (p<0.001).The distribution of mean onset of motor
blockade (mins) was significantly earlier in Group B (27.27 ± 1.82) compared to Group A (28.88 ± 1.74) (p<0.001). The mean duration of sensory and motor blockade was also significantly longer in Group B than in Group A (P-value<0.05). The distribution of mean time (hrs) to rescue analgesia was significantly longer in Group B (10.58 ± 0.92) than Group A (5.35 ± 1.38) (p-value<0.001).

**CONCLUSION**

It was seen in this study that Single shot Supraclavicular Brachial Plexus Block analgesia was of longer duration in Bupivacaine plus Dexamethasone group than plain Bupivacaine Group.
POST SURGICAL ANALGESIA IN MODIFIED RADICAL MASTECTOMY SURGERIES USING THORACIC EPIDURAL WITH OR WITHOUT FENTANYL

Author: Dr. Harmandeep Kaur, SGRDUHS
Co-Author(s): Dr Ruchi Gupta, Dr Ishpuneet Singh, Dr Chiteshwar Walia
Paper Id: ISSP048

SUMMARY:
True compassion means not only feeling anothers pain but also being moved to help relieve it. Significant level of pain is associated after Modified radical mastectomy (MRM) surgery. We conducted this study to evaluate and compare the efficacy of epidural ropivacaine with or without fentanyl in terms of pain relief and complications.

AIMS AND OBJECTIVES:
To compare duration of postoperative pain relief and complications using epidural ropivacaine versus ropivacaine- fentanyl combination in patients undergoing breast cancer surgeries.

MATERIAL AND METHODS:
60 females were divided in two groups after informed consent and ethics clearance,
Group A (n=30) Receiving 6ml of 0.25% ropivacaine with 2 ml of normal saline through epidural route 15-20 mins before induction
Group B (n=30) Receiving 6ml of 0.25% ropivacaine with fentanyl 100 mcg (50 mcg/ml) through epidural route 15-20 mins before induction
General anaesthesia was given to all. Postoperatively the duration of analgesia and requirement of epidural top-ups were noted. Complications were also studied.

RESULTS:
Demographic data was comparable. Mean duration of analgesia observed in group A; B were 270.96 ± 26.88 and 328.74 ± 27.20 minutes, respectively (p < 0.001). Similarly total dose of ropivacaine and number of top-ups required for postoperative analgesia was less in fentanyl group compared to other group (p < 0.001). Side-effects were comparable (p > 0.05).

CONCLUSION:
Adding fentanyl to epidural ropivacaine in MRM surgeries had better and prolonged analgesia postoperatively as compared to ropivacaine alone.
HEART RATE VARIABILITY AND PAIN INTENSITY IN CHRONIC NEUROGENIC PAIN - A COMPARATIVE CROSS-SECTIONAL STUDY

Author: Dr. John Rajan, JIPMER
Co-Author(s): Dr. G. S. Gaur, Dr. S. Karthik, Dr. S. Adinarayanan

Paper Id: ISSP049

Summary:
Heart rate variability from five minutes resting ECG and Pain intensity using the Wong-Baker FACES pain rating scale were studied in chronic neurogenic pain patients (n=13) and compared with age and gender matched healthy controls (n=12). Mean heart rate, NN50, pNN50 from the time domain analysis of heart rate variability showed significant difference between the two groups, suggestive of possible disturbance in sympatho-vagal balance. Correlation between pain intensity and parameters of heart rate variability analysis showed no significance.

Aim of Investigation:
1. To compare heart rate variability indices among chronic neurogenic pain and healthy controls.
2. To determine the correlation between pain intensity and heart rate variability parameters

Methods:
The study done on chronic neurogenic pain patients and age and gender matched healthy controls comprised of assessment of pain intensity using Wong-Baker FACES Pain Rating Scale and the time domain and frequency domain parameters of heart rate variability done on five minutes resting lead II ECG recording. The heart rate variability parameters between neurogenic pain patients and healthy controls were compared and correlation between pain intensity and heart rate variability parameters were assessed.

Results:
The Mean heart rate expressed in terms of mean (SD), NN50 and pNN50 expressed in terms of median (IQR) are significantly different when comparing the pain vs. the control group and are respectively represented as follows. Mean heart rate [83.69 (15.036) vs. 66.34 (6.999), p value=0.013]; NN50 [3 (39) vs. 34 (88), p value=0.044]; pNN50 [0.8 (11) vs. 12.35 (29), p value=0.022]. There was no correlation between pain intensity and heart rate variability indices.

Conclusion:
The differences in mean heart rate, NN50, pNN50 between neurogenic pain patients and healthy controls are suggestive of possible disturbance in sympatho-vagal balance. There was no significant correlation between pain intensity and heart rate variability parameters in chronic neurogenic pain.

Keywords: Chronic neurogenic pain, Heart rate variability, Wong-Baker FACES Pain Rating Scale
COMPARISON OF POST OPERATIVE ANALGESIA FOR LOWER LIMB JOINT REPLACEMENT SURGERIES USING FENTANYL VS BUTORPHANOL : A DOUBLE BLINDED, RANDOMISED CONTROLLED TRIAL.

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Co-Author(s): Dr Aakriti, Dr Anita Kumari
Paper Id: ISSP050

SUMMARY:
Post operative pain if managed appropriately leads to early ambulation, thus favouring better recovery and thus reducing the length of hospital stay. Intrathecal fentanyl has been widely used as an adjuvant in various studies. So we planned to use another adjuvant that can give more prolonged postoperative analgesia.

AIMS of investigation:
To compare the duration of post operative analgesia using intrathecal fentanyl vs butorphanol as adjuvants in lower limb joint replacement surgeries over a 24 hour time period.

MATERIALS AND METHODS:
We conducted a prospective, randomised, double blinded study in 80 patients of 18-75 years age group of ASA 1 and 2 undergoing joint replacement surgeries of the lower limb. They were randomly allocated into 2 groups of 40 patients each.
Group A received 0.5% bupivacaine 3 ml with 25 mcg fentanyl with a total volume of 3.2 ml whereas Group B received 0.5% bupivacaine 3 ml with 25 mcg butorphanol as an adjuvant diluted with sterile water to make a total volume of 3.2 ml.
Epidural bolus doses of 0.125% Bupivacaine 6-8 ml were given as post operative analgesia when patient complained of VAS ≥ 4. Analgesia was supplemented with a rescue analgesic – Inj diclofenac sodium 75 mg IM. Pain intensity was measured using VAS at 15 min, 1, 2, 4, 6, 8, 16 and 24 hours postoperatively along with NIBP and HR monitoring.

RESULTS:
Group B had a longer duration of analgesia as compared to Group A and was found to be highly significant (P value < 0.001). Rescue analgesic requirements were also found to be lesser in Group B as compared to Group A.

CONCLUSION:
The addition of butorphanol intrathecally as an adjuvant to bupivacaine provides better and longer duration of analgesia as compared to fentanyl.
INTRA-ARTICULAR HYALURONIC ACID INJECTION VERSUS RF ABLATION OF GENICULAR NERVE FOR KNEE OSTEOARTHRITIS PAIN: A RANDOMIZED, OPEN-LABEL, CLINICAL STUDY

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Paper Id: ISSP051

Summary
Chronic knee osteoarthritis (OA) is one of the most common diseases of advanced age. Available therapies have insufficient evidence and adverse effects. Hyaluronic acid (HA) injection reduces knee pain in certain patients only for short duration. Radiofrequency (RF) neurotomy of genicular nerve branches has been tried recently. Comparison of these two modalities is lacking.

Aims of investigation
The aim of this study was to compare pain relief and daily activities by visual analog scale (VAS) and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores between intra-articular HA injection and RF neurotomy of genicular nerves.

Materials and Methods
Patients were treated with intra-articular HA injection and RF neurotomy of genicular nerves 12 in each group (n = 12). Pain relief and day-to-day activity were compared.

Results
There was statistically significant difference and lower VAS and WOMAC scores in the RF group compared to HA group after treatment.

Conclusion
As compared to intra-articular HA injection, RF neurotomy of genicular nerves appears to be a promising and more effective therapeutic procedure for patients with chronic knee OA.

Keywords: Genicular nerve, knee pain, radiofrequency
Knee pain secondary to osteoarthritis is a common problem in elderly patients. Symptomatic disease is found in 10% of men and in 13% of women more than 60 yrs of age. Most of the studies use conventional radiofrequency for genicular nerve block in osteoarthritis knee, usg guided PRF ablation done in few studies. Till now to best of our knowledge no study compared pulsed radiofrequency vs local anaesthetics with steroid for osteoarthritis knee pain.

AIM: to compare efficacy of ultrasound guided of pulsed radiofrequency vs local anaesthetics with steroid for management of osteoarthritis pain.

METHODS:
The study was conducted on a total of 30 patients. 30 patients were randomly allocated into two groups. one group received pulsed radiofrequency ablation (PRF group n=15) and one group received local anaesthetics combined with steroid (LAS GROUP n=15). During the procedure each targeted genicular nerve were ablated using pulsed radiofrequency (temp to a maximum of 42ºc) for a time period of 180 seconds. In local anaesthetics with steroid group 2ml of bupivacine 0.5% and methylprednisolone acetate 80 mg were used in divided dosage for blocking genicular nerve. Primary objective was proportion of patients achieving atleast 50% reduction in VNRS scores (verbal numeric rating scale) compared baseline to at 3 month. secondary objective to compare change in VNRS score and WOMAC score at 2, 4,8,12 weeks with baseline value, any adverse effects and need for rescue analgesia. results: Eleven patients (73%) in group PRF and ten patients (66%) in group LAS had effective pain relief (≥ 50% reduction in pain) at 12weeks. VNRS score decreased statistically significantly (p value < 0.001) in both groups at various time intervals as compared to baseline. there was also statistically significant (p valve < 0.001) improvement in WOMAC score in both the groups. There was no difference in VNRS and WOMAC scores between the two groups. we did not come across any adverse effect during procedure or follow-up.

CONCLUSION:
On the basis of these results, we cannot recommend one treatment option over another, but radiofrequency ablation can mean avoiding using corticosteroids and the possible complications of their use in elderly patients. All the same, in the absence of these comorbidities and when radiofrequency ablation is not available, a block with corticosteroids is a useful and option for treating those patients.
BARRIERS TO OPTIMAL PAIN RELIEF IN CHILDREN – SURGEON’S PERSPECTIVE

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Paper Id: ISSP053

Background
Despite substantial advances in pain research and its management in children and neonates, a large numbers of them continue to suffer because of inadequate pain control. Uncontrolled acute pain not only leads to discomfort and suffering but also has unwanted consequences of increased morbidity such as delayed healing, prolonged hospital stay, and the risk of developing chronic persistent pain. The appropriate pain management is neonates and children is lacking. Factors which prevent the execution of proper pain relief vary from centre to centre.

Aims
To analyse the knowledge and practice of pain management in neonates and children amongst the residents and the nursing staff, we conducted this survey so as to identify the barriers to pain management from a Surgeon’s perspective.

Methods
A survey was conducted at a tertiary level institute among the resident doctors and nursing staff by means of an informal questionnaire analysing their basic knowledge. The questions pertained mainly to pain assessment, analgesic usage, role of opioids, formal training and the responses so obtained, were analysed under these four headings.

Results
Seventy three percent (22 / 30) of the residents and 74 % (26 /35) of the nursing staff knew about pain assessment scoring system in paediatric patients. However, assessment of pain in emergency was always done by only 6.6% of the residents. Effect of analgesia on severity of pain was never recorded by 33% (10/30) of the residents. Eighty six percent (26/30) of the residents and 91% (32/35) of the nursing staff had adequate knowledge about analgesic dosage and interval for routine use. Ten of the 30 (33%) residents believed that analgesic administration in an acute abdomen, before definitive diagnosis, will always mask the symptoms. During a minor procedure, 56% (17/30) of the residents always used analgesia. Only 3.3% (1/30) of residents and 2.8% (1/35) of the nursing staff had received a structured training for pain management. Although, 93% (28/30) of the residents claimed to know about the safety of use of opioids, only 46% (14/30) used them routinely as analgesics.

Conclusions
Our survey showed that, the pain management often took a backseat while managing surgical neonates and children. We need to have certain pain treatment protocols in place, which are to be followed and checked at regular intervals so as to ensure complete enforcement.

Funding Support - Nil
Conflict of Interest - Nil
ULTRASOUND GUIDED GREATER NERVE BLOCK FOR MANAGEMENT OF CHRONIC NECK PAIN

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Paper Id: ISSP054

Introduction

Neck/shoulder and hand/arm symptoms are a common problem in society, in particular among the working population. 34-43% of the population report having neck pain. Treatment options commonly used are physical therapy, epidural steroids or surgery. Here we discuss a series of patients with chronic neck pain, who received an ultrasound guided greater occipital nerve block for pain management. Case 1 is 46 year old female patient c/o neck pain since 6 months aggravated on neck movements who presented with severe spasm of neck muscles and had a posture as if wearing a neck collar. Her MRI showed mild disc bulge at c4-5, c5-6 levels touching the cord parenchyma without any compression. Case 2 is 19 year old female with neck pain for more than 8 months duration. Case 3 is 38 year old male with neck pain radiating to right upper limb.

Aim of Investigation

To develop an easy, effective, minimally invasive procedure for managing patients with chronic neck pain which might be an alternative to cervical epidural.

Methods

All patients received greater occipital nerve block under ultrasound guidance on the side of pain with injection Bupivacaaine (0.125%) and Injection Triamcinolone (10mg) and total volume 3 ml on each side. Adequate spread was seen.

Results

All patients reported a significant decrease in VAS score and decrease in perceived pain intensity. The patients were also continued on medications and physiotherapy.

Conclusions

The greater occipital nerve block is a simple, less invasive approach to provide analgesia for neck pain. Earlier studies have suggested the benefit of using this block in cervicogenic headache, occipital, craniofacial neuralgias, idiopathic facial pain etc. Greater occipital nerve block is technically easier to perform with the use of ultrasound and has relatively less chances of serious complications. All procedures in our series were performed on a day-care basis. The literature available is inadequate for describing the utility of greater occipital nerve block in neck pain and more studies are warranted in this regard.

Acknowledgments / Disclosures:

No disclosures
PULSED RADIOFREQUENCY NEUROMODULATION VERSUS LOCAL ANAESTHETIC STEROID NERVE BLOCK OF LATERAL FEMORAL CUTANEOUS NERVE IN PATIENTS OF MERALGIA PARESTHETICA.

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Co-Author(s): Dr Arthi Ashokan, Dr Hammad Usmani
Paper Id: ISSP056

Introduction
Meralgia Paresthetica (MP) is an entrapment neuropathy of the lateral femoral cutaneous nerve. Patients present with complains of burning sensation, tingling, lightning pain and numbness, in the anterolateral part of thigh.

Material and Method
The institutional ethics committee approved this study.
50 patients suffering from Meralgia paresthetica for at least six weeks duration were enrolled for the study.
They were equally divided into two groups of 25 each.
Group C – Control group; patient’s reciieved local anaesthetic and steroid nerve block with methylprednisolone and bupivacaine.
Group P – Study group; Patients who received two cycles of pulsed radiofrequency neuromodulation of the lateral femoral cutaneous nerve of 120 seconds each.
Primary outcome - Measurement of pain intensity of the patients in pre- and post-treatment period by visual analog scale (VAS) and Neuropathic pain symptom inventory (NPSI) score.
Secondary outcome - Improvement in quality of life of patients and side effects were noted.

Results
Group C had significant decrease in VAS score at 6 weeks from baseline (7.56 ± 1.55 to 1.24 ± 0.96, p value < 0.005) but the difference was insignificant at 12 weeks (5.54±0.86).
Significant reduction in NPSI scores was noted at 6 weeks from baseline (71.8 ± 11.78 to 20.72 ± 5.82, p value < 0.005) but the difference was insignificant at 12 weeks (60.12± 3.82).
Group P had significant decrease in VAS score at 6 weeks and at 12 weeks from baseline (7.16 ± 1.54 to 1.7± 0.97 and 1.3 ± 0.78, p<0.005).
Significant reduction in NPSI scores at 6 weeks and twelve weeks from baseline (75.12 ± 9.6 to 19.76 ± 5.91 and 22.71 ± 4.62).
No major complication was reported in patients of either group.
Conclusion
Both the interventional procedures provided significant decrease in pain scores in patients of Meralgia paresthetica but the duration of pain relief was significantly longer in patients who received pulsed radiofrequency neuromodulation.
ASSOCIATION OF VITAMIN-D LEVELS AND TENDER POINT COUNT IN PATIENTS WITH FIBROMYALGIA

Author: Dr. Ann Vincent, Mayo

Co-Author(s): Mary Whipple, Loren Toussaint

Paper Id: ISSP057

Summary:
Fibromyalgia is a chronic pain disorder characterized by widespread pain and a host of other symptoms including fatigue, musculoskeletal stiffness, unrefreshing sleep, low mood, elevated anxiety and cognitive difficulties. The American College of Rheumatology (ACR) 1990 clinical criteria recommended evaluation of patients with fibromyalgia utilizing both symptoms and tender point count. A recent meta-analysis reported that patients with fibromyalgia had lower levels of vitamin-D levels when compared to healthy controls and a recent study suggested that vitamin-D supplementation improved tender point counts in patients with fibromyalgia. However, no study to date has reported relationships between tender point count, the only objective clinical marker in fibromyalgia, and vitamin-D levels.

Aim of investigation
Using data from an existing cohort of patients with fibromyalgia who sought clinical care in the Mayo Fibromyalgia Clinic and met the ACR 2010 criteria, our aim was to determine if there was a relationship between vitamin-D level and tender point counts.

Methods:
Data were obtained from a cohort of patients seen in the Mayo Fibromyalgia Clinic. All patients met ACR 1990 clinical criteria for fibromyalgia. At the time of their clinical evaluation, tender point examination was conducted and tender point count (out of 18), vitamin-D levels ng/ml, age, sex, and body mass index (BMI; kg/m²) were recorded.

Results:
Average age in our cohort was 47 (SD = 13), most patients were female (91%), and the average BMI was 30 (SD = 8). Average vitamin-D level was 37 (SD = 17) and average number of tender points was 15 (SD = 4). The bivariate correlation between vitamin-D and number of tender points was r = .02, p = .66. The partial beta coefficient, controlling for BMI, age, and sex was, Beta = .02, p = .69, again showing no association between vitamin-D and number of tender points. The association between vitamin-D and number of tender points was also not moderated by age, sex, or BMI (Betas < .11, ps > .41).

Conclusion:
To our knowledge, this is the first report to date evaluating the relationship between an objective measure of tenderness with vitamin-D levels in patients with fibromyalgia. The results of the study failed to show any association between vitamin-D levels and number of tender points. Given the current conflicting consensus regarding vitamin-D and fibromyalgia, future studies with larger samples of well-characterized patients should be pursued to evaluate if there is a relationship between number of tender points and levels of vitamin-D and if vitamin-D supplementation may have a role in fibromyalgia symptom management.
PSYCHO SOCIOECONOMIC BURDEN OF CHRONIC PAIN - A CROSS SECTIONAL PROSPECTIVE STUDY ON PATIENTS VISITING PAIN CLINIC OF A TERTIARY HOSPITAL

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Co-Author(s): Dr Jayshree Geete, Dr Indrani Chincholi
Paper Id: ISSP059

Introduction:
Chronic pain is major health problem in the world that produces significant social, economical and psychological burden not only on patients but also on family, society and nation at large.

Material & Methods:
This is a cross sectional prospective study conducted in a tertiary care public hospital after institutional ethic committee permission. Patients suffering from chronic pain (>3 months) visiting pain clinic were included. The validated Case record form (CRF) had four sections A-demographic data, B-social (VAS at rest, VAS on activity, missed any social events, family support), C-economic (monthly income, expenses on pain medications, visits, leave and loss of wages), D-psychological aspects (PHQ 9). Descriptive statistics of mean, standard deviation and percentage was used to summarize the data obtained. Sub-group analysis for various categories of outcomes was done by t-test as per distribution for numerical variables and Chi-square test for categorical variables.

Results:
A total of 84 patients were included in the study. Mean age of patient was 45.08±13.8 years. Average duration of pain was 25.6±36.5 months. VAS at rest was a median of 6 and on activity was a median of 8. In 84% of participants, daily activities were ‘mostly affected’. 20% of participants missed all social events. Mean monthly income was Rs.14563±10,000. Direct cost of the pain management was an average of Rs.29025±41790. Indirect cost of pain management was Rs.10228±15083. PHQ-9 had a median of 10 suggestive of presence of moderate depression.

Conclusion:
Chronic pain occurs during most productive years of life restricting daily and social activities, creating psychological issues like depression, anxiety and sleep deprivation and thus affecting quality of life. Economic burden for chronic pain management is huge especially in private facilities. Thus, pain clinic with relevant expertise and resources should be easily accessible to needy patients.
PAIN FREE REMOVAL OF BRONCHIAL FOREIGN BODY WITH EXCLUSIVE AIRWAY BLOCKS

Author: Dr. Avinash M, YENEPoya MedicaL CoLLeGe
Co-Author(s): Dr Ananth Prasad Rao
Paper Id: ISSP060

SUMMARY
49 years old male patient with history of COPD on treatment for 25 yrs, with accidental aspiration of metal nut for 5 months. The foreign body was logged in left main bronchus. Patient had complaints of cough with expectoration since 1 month. O/E there was decreased air entry on the left side with B/L lung crepitation and ronchi. Patient had ORTHOPNEA and his room air saturation was 89%. No known systemic co morbidities. Bronchoscopy was done under exclusive air way block as general anaesthesia could not be given. Patient tolerated the procedure well and the foreign body was removed uneventfully.

AIM OF STUDY
Air way block as a safe alternative to sedation in patients whose airway cannot be secured like in a case with foreign body in airway with respiratory track infection.

METHODS
Patient was taken for bronchoscopy. On table GLOSSOPHARYNGEAL nerve was blocked with 10% LIDOCAINE SPRAY + 2% VISCOS LIDOCAINE. With 26 G needle Superior Laryngeal nerve block with 2% LIDOCAINE and with 18 G needle a 20 G epidural catheter was threaded up to 10 cm and TRANS TRACHEAL BLOCK was given with 4% LIDOCAINE. Vitals was closely monitored and maintained. The procedure was uneventful and quick (15 min). Patient compliance and tolerance was good.

RESULTS
Foreign body removed uneventfully with patient being conscious, maintaining spontaneous ventilation and minimal adverse effects and without any administration of respiratory depressents like benzodiazepines, opioids and induction agents.

Conclusions
Air way blocks can be used as sole analgesic in patients with complicated haemodynamic and systemic illnesses in removing complicated foreign bodies involving the airway.

REFERENCES
INTRAMUSCULAR STIMULATION FOR NECK PAIN DUE TO PROLAPSED CERVICAL DISC

Author: Dr. Varsha Kurhade, RUBY HALL CLINIC, PUNE
Co-Author(s): Dr. Kashinath Bangar, Dr. Nivedita Page

Paper Id: ISSP061

Summary
Neck pain (NP) is a major public health problem, directly affecting personal health and well-being, and indirectly leading to increased healthcare expenses. About two thirds of the population have experienced neck pain at some point of time in their life and majority are thought to have a postural or mechanical basis, with poorly understood causative factors. Multiple causative factors such as poor posture, anxiety, depression, neck strain, muscle sprain and sporting or occupational activities have been implied. Cervical spondylosis is a common term used for age related degeneration of the mechanical structures in and surrounding the cervical spine. Most individuals over the age of 30 years, show similar abnormalities on plain radiographs of the cervical spine, and even on magnetic resonance imaging (MRI). Hence the boundary between normal ageing and disease is difficult to define. On the other hand, even severe degenerative changes are often asymptomatic, but can lead to neck pain, stiffness, or neurological complications. Similarly myofascial component contributes to great extent in neck pain. Myofascial pain syndrome is collection of the sensory, motor, and autonomic symptoms that include local and referred pain, decreased range of motion, and weakness. The health impact of myofascial pain can be quite severe as patients with the disorder suffer from decreased functional status associated with musculoskeletal pain. In the treatment of chronic myofascial pain immediate pain relief can be achieved with dry needling (IMS). Mechanism of IMS to produce analgesia is by hyperstimulation analgesia via the descending pain inhibitory system which has been called the “needle effect”. This provides the insight to incorporate IMS as primary treatment modality in multidisciplinary pain management of neck pain.

Aim of investigation
To assess the efficacy of Intramuscular stimulation for neck pain due to prolapsed cervical disc.

Methods
It is a case series of 5 consecutive patients with neck pain having anatomical abnormalities on MRI scan of cervical spine treated with conservative measures & IMS.

Result & conclusion
In clinical practice, rather than chasing the abnormalities on MRI, focus of physicians should be on clinical signs and symptoms, thus avoiding unnecessary and potentially hazardous interventions, along with good long term relief. IMS can be used as one of the primary modalities with improved pain outcome and clinically evident return of function.
SETTING UP AND IMPLEMENTATION OF EPIDURAL LABOR ANALGESIA SUITE IN A TERTIARY CARE TEACHING HOSPITAL

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Paper Id: ISSP062

Summary

Although epidural analgesia was in use for years and has a proven record to be known as the gold standard for labour analgesia, due to various reasons it is not been made popular and the percentage of parturients who choose it as a method of pain relief is not in significant numbers in our country. This study was undertaken to find out the practical difficulties in implementing labour analgesia among parturients and device a protocol. We performed labour analgesia using epidural and set up a suite for the same and provided pain relief to labouring mothers during the study period and is being continued. The process of implementation and difficulties faced were observed.

Aim of Investigation

- To set up a labour analgesia suite in a tertiary care teaching hospital.
- To formulate an institutional protocol for epidural labour analgesia, implement it and identify the practicality.

Methods

After achieving approval from ethical committee, institutional research committee and hospital authorities we identified an appropriate site to setup a labour analgesia suite and the first 50 parturients requesting pain relief were offered analgesia with lumbar epidural at L3-4 space using varying concentrations of ropivacaine. We assessed the quality of pain relief using numerical rating scale, mode of delivery, complications and maternal satisfaction.

Results

Setting up of labour suite involved a lot of paperwork right from the location, equipment and staff. But we observed that it is hard to earn patients even for a free service offered for many reasons. Injection Ropivacaine at a dose ranging from 0.5% to 0.2% provided satisfactory analgesia without significant side effects.

Conclusions

Although it is hard to initiate something with an intent to improvise the existing standard of care, unanticipated difficulties are very often encountered. However, the smiling face of a pain-relieved parturient pays well for the effort taken. Once the culture sets in, it is easier to roll on, but it was
observed that the system still needs constant reinforcements to continue. We observed that Ropivacaine can be a very effective epidural drug for analgesia in the studied doses without significant side effects.

Acknowledgments/Disclosures:
We thankfully acknowledge the IRC for the financial support and the departments of Anaesthesiology and Obstetrics & Gynaecology for the support offered. We owe no other commitments towards any pharmaceutical and equipment manufactures or suppliers.
“AN AMALGAMATION OF BIOPSYCHOSOCIAL MODEL OF PAIN MANAGEMENT WITH SPLANCHNIC NERVE BLOCK FOR CHRONIC CALCIFIC PANCREATITIS PAIN IN AN ADOLESCENT”

Author: Dr. Monisha Kulkarni, Yenepoya Medical College
Co-Author(s): Dr Ananth Prasad Rao
Paper Id: ISSP063

Summary
Chronic calcific pancreatitis is a condition difficult to treat owing to its complexity. Chronic conditions of upper abdomen produce severe intractable visceral pain which are usually treated with splanchnic nerve block or Splanchnic plexus neurolysis. Preprocedural VAS scale was 8/10 and Facies scale was indicated towards most painful scale. This procedure is performed using methylprednisolone or alcohol along with lignocaine. We are presenting a case of chronic calcific pancreatitis that did not resolve with Splanchnic nerve block alone but produced excellent results when amalgamated with a biopsychosocial model of pain management. This psychosocial model is commonly used in chronic pain, with the view that the pain is a psychophysiological behaviour pattern that cannot be categorised into biological, psychological, or social factors alone. Involvement and interaction between the medicosocial worker, parents and school authorities and subsequent education of the disease process and etiology to the concerned authorities with psychological support and interventional pain management to the adolescent provided adequate pain relief and the goal towards admitting the boy back to school and his involvement and our motive was achieved.

Aim of Investigation
Our aim was to reduce chronic pain and achieve academic reenrollment following discontinuation of schooling due to complex pain disorder.

Methods
Procedure done under fluoroscopic guidance, patient sedated with 50 mcg of Fentanyl and 1 mg Midazolam, patient turned into prone position, nasal oxygen kept. Using fluoroscopic guidance 22 G needle injected at T-11 vertebral body. Needle placed between the junction between the anterior and middle 3rd of vertebrae. Non ionic, non neurotoxic contrast fluid injected to rule out vascular spread, following which
local anaesthetic 1% 3ml injected, subsequently Depomedrol/Alcohol injected (10 ml 60%) on either side.

Results-
Pain score improved from 8/10 to 2/10. And Facies scale improved . satisfactory improvement achieved qualitative Facies scale analysis.

Conclusion-
Successful implementation of interventional and biopsychosocial model of pain management achieved by reducing both psychological and pathological components of pain.
AWARENESS & KNOWLEDGE OF PAIN MANAGEMENT AMONG THE DOCTORS IN TERTIARY CARE HOSPITAL

Author: Dr. Shahnawaz Shah, LILAVATI HOSPITAL & RESEARCH CENTRE, MUMBAI
Co-Author(s): Dr D.K.Baheti, Dr Jitendra Jain
Paper Id: ISSP064

Background:
Pain control is a vitally important. Untreated pain has detrimental impacts on the patients and negatively affects their quality of life. Limited knowledge and negative attitudes toward pain management were reported as one of the major obstacles to implement an effective pain management among the doctors.

Aim & Objective:
The main purpose for this study was to assess the awareness and knowledge among the doctors regarding pain assessment and management as well as to assess awareness about “Pain Management Specialty” in tertiary care hospital in Mumbai, India.

Methods:
After Research committee & IEC approval, cross-sectional survey was done. 250 doctors were given printed validated questionnaires form, out of which 235 received back. 17 Questions were to assess knowledge about analgesic use (5 questions), pain assessment in relation to patient’s perception (5 questions), prejudice about presumed misuse of Opioids (5 questions) and awareness about “Pain management specialty” (2 questions). Data expressed as number and percentages.

Results: to be calculated

Conclusions: to be drawn

Acknowledgments: We are grateful to the Research Department, LHRC Mumbai for the support provided.

Disclosures: No disclosure
TRANSVERSE ABDOMINIS PLANE BLOCK WITH EPIDURAL CATHETER IN SITU FOR DIAGNOSIS AND TREATMENT OF ABDOMINAL CUTANEOUS NERVE ENTRAPMENT SYNDROME

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Paper Id: ISSP065

SUMMARY
2 out of 10 patients with chronic abdominal pain are found to have abdominal wall pain. Abdominal cutaneous nerve entrapment syndrome(ACNES) is a compressive neuropathy of cutaneous branches of the 7-12th intercostal nerves.
A 42-year female patient, presented with chronic pain abdomen of 15 years, which extended from the right hypochondrium to the right inguinal region and its intensity on the visual analogue scale (VAS) was 8.
She had history of multiple surgeries in the past. Routine laboratory test, radiographs of chest, abdomen, and lumbar spine; Abdominal ultrasonography(USG), CT Scan, Gastroscopy, and colonoscopy were all inconclusive. 2 Endoscopic Diagnostic laparotomy, adhesolysis, appendicectomy, cholecystectomy, hysterectomy were all done but had inadequate relief.
Carnett test was positive, and ACNES was suspected. Patient sceptical about injections from her past experience of short duration and inadequate pain relief after receiving multiple injections.
Epidural catheter was inserted between internal oblique and transversus abdominis to provide sustained and adequate pain relief and ally her fear about her misconception and assure her that a TAP Block wasn’t a routine regular procedure.

AIM OF INVESTIGATION
To provide effective treatment to a patient who has left no stone unturned and undergone multiple surgeries and diagnostic tests in the pursuit of finding pain relief.

METHODS
TAP block administered using 18 G epidural needle and 15 ml of 0.25% of Ropivacaine with 40 mg of Methylprednisolone was injected under USG guidance. Following which an epidural catheter was inserted, tunneled and fixed for a further bolus dose of 0.2% of 10 ml Ropivacaine TID over the next 3 days.

RESULTS
Patient was reassessed, and the pain intensity had decreased drastically and a VAS of 3 was found. Post procedure patient didn’t complain of any recurrence of pain. Epidural catheter was removed 3 days later and she was discharged. On follow up she had adequate pain relief.

CONCLUSION
Even though ACNES is rare, it should be suspected when there is no evidence of any other pathology. Unindicated interventions can be avoided in these patients, with prompt diagnosis and a lot of patient relief and satisfaction can be achieved with a procedure as simple as a TAP Block.
ULTRASOUND GUIDED GENICULAR NERVE BLOCK IN A PATIENT OF CHRONIC RENAL DISEASE SUFFERING FROM SEVERE PAIN DUE TO OSTEOMYELITIS OF KNEE JOINT

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Co-Author(s): Ananth Prasad Rao
Paper Id: ISSP066

SUMMARY

35 year male, who had severe right knee joint pain, diagnosed to have osteomyelitis of right knee, Chronic Kidney Disease on maintenance haemodialysis, Hypertension, suspected TB on empherical ATT. Patient had no pain relief and was immobilised for months inspite of arthrotomy and synovectomy with subsequent drainage of infective exudate from the knee. He underwent Ultrasound guided genicular nerve block of right knee, immediate pain relief was obtained and was able to walk with support.

AIM OF THE STUDY

To evaluate the efficacy of ultrasound guided Genicular Nerve Block by using local anaesthetic and corticosteroid for short term pain relief.

METHOD

A genicular nerve block is the injection of a local anaesthetic to block the nerves that transmits pain from the knee. In supine position this procedure was performed using Ultrasound guidance. In-plane approach using 22 gauge needle which was inserted around the knee and visualised in the region of the genicular nerves.0.5% Ropivacaine with Methylprednisolone 10 to 15mg given on each side.

RESULT

Patient had immediate pain relief and was able to walk with support, had improved quality of life and on a later date requested to undergo radiofrequency ablation for long term pain relief.

CONCLUSION

Ultrasound-guided genicular nerve block, when combined with a local anaesthetic and corticosteroid, will provide short-term pain relief and also serves as a guide for radiofrequency ablation of genicular nerves which provides long term pain relief in patients suffering from chronic knee joint pain.
REFERENCES
DOES AN ACUTE PAIN SERVICE IMPROVE THE PERCEPTION OF POSTOPERATIVE PAIN MANAGEMENT IN PATIENTS UNDERGOING LOWER LIMB SURGERY? A PROSPECTIVE OBSERVATIONAL STUDY

Author: Dr. Kompal Jain, Government medical college and hospital
Co-Author(s): Kompal Jain, Sukanya Mitra, Jasveer Singh, Jannat Kang, Swati Jindal, Sudhir Garg
Paper Id: ISSP067

Background and Aim:
Postoperative pain is a form of acute pain and unresolved postoperative pain has important long-term complications. An Acute Pain Service (APS) has been running in our Institute since April 2013 by the Department of Anaesthesia & Intensive Care. However, it is not clear to what extent the patients feel benefited from the APS. The aim of the study was to compare the perception of postoperative pain management of those patients undergoing lower limb surgery receiving care under APS with those receiving routine postoperative pain relief.

Method:
This was a prospective, hospital based, controlled observational study (survey design with a control group). American Society of Anesthesiologists (ASA) grade I-III patients with age 18-75 years undergoing lower limb orthopedic surgery were prospectively recruited into APS (Index group) and routine postoperative care (Control group) (n=55 each). Postoperatively, American Pain Society Patient Outcome Questionnaire-Revised (APS-POQ-R) and Short Form (SF-12) were used to evaluate and compare outcome of postoperative pain management at 24h and health-related quality of life after 4 weeks in both the groups respectively.

Result:
Both groups were comparable in terms of demographic data. Patients in the index group had statistically significant better perception of care than the control group. Index group scored significantly higher than Control group on median patient satisfaction score (9, IQR 7,10 vs. 5, IQR 3,6; p<0.001). In Index group, there was significant reduction of worst pain in first 24 hours (median 6, IQR 3,8) along with decreased frequency of severe pain (median 2, IQR 1,4; p<0.001) and pain related interference with various activities including sleep, emotions (p<0.001) and decreased incidence of nausea (p=0.003).

Conclusion:
Implementation of acute pain service plays an important role in improving the quality of postoperative pain relief, patient safety and satisfaction thereby, increasing the health standards. Later studies with randomised controlled design, larger sample size and using a more detailed questionnaire can further add to the value of this study.
PREPROCEDURAL ULTRASOUND AS AN ADJUNCT TO BLIND CONVENTIONAL TECHNIQUE FOR EPIDURAL NEURAXIAL BLOCKADE IN OSTEOPHYTIC SPINES: A RANDOMISED CONTROLLED TRIAL

Author: Dr. Kompal Jain, Government medical college and hospital

Co-Author(s): Kompal Jain, Arun Puri, Rajeev Taneja, Vikky Jaiswal

Paper Id: ISSP068

Background:
Patients undergoing total hip and knee replacement surgeries are mostly obese, more than fifty years of age, having arthritic joints with osteophytic spine, narrowed intervertebral spaces, indistinct anatomical landmarks and spine deformities. Variable epidural space and suboptimal position adds to the difficult access to epidural space leading to multiple attempts. Failure to identify epidural space can be hazardous for the patient leading to inadvertent dural puncture and other complications.

Study objective:
To study the role of preprocedural ultrasound compared to conventional blind technique in obese patients with osteophytic spines undergoing total knee or hip replacement surgeries in terms of technical difficulty, clinical efficacy, safety and patient comfort.

Material and methods:
A Prospective, randomized controlled trial was conducted in a superspeciality hospital. 210 consenting ASA grade III patients, age > 50 years, BMI ≥ 30kg/m² with osteophytic spines including abnormalities undergoing joint replacement surgeries. The patients were randomized in two groups. Ultrasound group received Combined Spinal Epidural Anaesthesia (CSEA) after preprocedural lumbar ultrasound scan. In control group, CSEA was given by blind conventional group. Primary outcome was to compare the rate of successful epidural block on 1st needle insertion attempt. Secondary outcomes and observations included number of needle insertion attempts, needle passes (insertion and redirection attempts) required for successful epidural block, correlation of depth of the epidural space measured with two views of Ultrasound and Loss of Resistance (LOR) technique and efficacy of epidural component of CSEA measured by Visual Analog Scale (VAS), patient satisfaction score and number of complications like accidental dural puncture by Touhy’s needle and failed block.

Main results:
Both groups were similar in physical characteristics. Ultrasound improved success of CSEA at 1st attempt from 74.28% in ultrasound group to 85.71% in control group (p=0.038). Fewer needle
insertion attempts (p-0.013), passes (p-0.022) and anaesthesiologist (p-0.044) were required in ultrasound group. Ultrasound precisely determined the depth of epidural space with insignificant difference of 0.007 cm (p-0.66) and Pearson correlation coefficient of 0.976 using both views. Ultrasound improved efficacy and safety with higher patient satisfaction score (p-0.019) and decreased procedural complications (p-0.003) like inadvertent dural puncture (p-0.013).

**Conclusion:**
Preprocedural ultrasound scan significantly increased the first attempt success rate, efficacy, patient satisfaction and safety of epidural neuraxial blockade. It is an useful adjunct to lumbar epidural blocks in obese patients with osteophytic abnormal spines.
CORRELATION OF SIZE AND LOCATION OF LUMBAR DISC HERNIATION ON MRI WITH EFFICACY OF LUMBAR EPIDURAL STEROID INJECTION

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Paper Id: ISSP069

Summary:

Chronic LBA with lumbar radicular pain is commonly treated with ESI. Various patient attributes, clinical symptomatology and MRI findings can be used to form a predictive tool following ESI. MRI of lumbosacral spine is invariably done all patient presents with LBA and radicular pain. Standard description of MRI findings can be compared with clinical outcome following ESI to identify favorable predictive finding that influence the outcome.

Clinical application of MSU classification of disc herniation did not yield a significant association with outcome following PIL ESI. MRI findings cannot be used to predict the outcome following PIL ESI.

Aim of Investigations

To study the correlation between outcome following lumbar parasagittal interlaminar epidural steroid injection with various size and location of lumbar disc herniation on MRI based on MSU classification in patients with chronic LBA and lumbar radicular pain.

Methods

This study was conducted at the pain clinic and pain OT of Department of Anaesthesia, PGIMER, Chandigarh from Jan 2016 – May 2017.

Patients of either sex between the age group of 30 to 60 years were enrolled in this prospective clinical outcome study.

Under fluoroscopy, PIL ESI was performed using 2 mL (80mg) of methylprednisolone acetate (1 mL = 40mg) with 2 mL of 1% lignocaine.

Follow up

Patients were followed up for a period of three months at an interval of 2 weeks, 1 month, 2 and 3 months. Those who had more than 50% reduction in VAS were grouped as responders and patients with <50% pain relief were grouped as non-responders.
Results
Patients with central disc herniation showed higher response rate (74%) in terms of location. With respect to the size, 72% of the patients with size-2 herniation showed successful outcome following PIL ESI. All patients pain scores and disability scores showed decreasing trend from the baseline towards the end of the 3rd month. There was no statistically significant difference in the outcome in patients with various location and size of herniated disc in MRI based on MSU classification of herniated lumbar disc. Further studies with large sample size and long term follow-up are required to confirm this finding.

Conclusions
Clinical application of MSU classification of disc herniation did not yield a significant correlation with outcome following parasagittal interlaminar epidural steroid injection in patients with low back ache and lumbar radicular pain. MRI findings cannot be used to predict the outcome following PIL ESI.
ERECTOR SPINAE PLANE BLOCK : RELATIVELY NEW BLOCK ON HORIZON WITH WIDE SPECTRUM OF APPLICATIONS – A CASE SERIES

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Paper Id: ISSP070

Introduction:
Erector Spinae Plane block is an interfascial plane block where a local anesthetic is injected in a plane preferably below the erector spinae muscle. It is supposed to work at the origin of spinal nerves based on cadaveric and contrast study.

Methods:
In this series, we report a series of six cases which includes postoperative pain management in breast, thoracic and abdominal surgeries along with management of two chronic pain cases to illustrate the potential uses of continuous and single shot ESP block.

Conclusion:
It has emerged as an effective, safer, newer analgesic regional technique. It has a wide variety of applications ranging from control of acute postoperative pain to chronic pain.
COMPARISON OF SUPRASCAPULAR NERVE BLOCK USING PULSED RADIOFREQUENCY ABLATION VS LOCAL ANAESTHETIC WITH STEROID IN PATIENTS WITH CHRONIC SHOULDER PAIN: A RANDOMIZED CONTROLLED TRIAL

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Paper Id: ISSP071

Summary:
Shoulder pain is a very prevalent musculoskeletal disorder. After low back pain and neck pain it ranks as third most prevalent musculoskeletal complaint. Many treatment modalities of treating chronic shoulder pain are present but effectiveness of one over the other is not known. To the best of our knowledge the head to head comparison of the effectiveness of the ultrasound guided PRF of SSN vs local anaesthetic and steroid has not been done.

AIM:
We planned this study to compare the effectiveness of PRF of suprascapular nerve (SSN) vs SSN block with LA and steroid under ultrasound guidance.

METHODS:
25 patients were included in the study. Randomization of patients was done in ‘P’ and ‘BS’ groups. ‘P’ group received ultrasound guided PRF of SSN for 480s and ‘BS’ group received ultrasound guided SSN block with LA and steroid. Patients had to continue with their physical therapy after the procedure. Primary outcome was to find the incidence of patients having significant pain relief ≥50% at 3 months. Secondary outcome was to find SPADI, NRS and improvement in PROM at various follow up times.

RESULT:
Our study showed that ultrasound guided SSN block with local anaesthetic and steroid was significantly more effective (≥50% reduction in pain relief) compared with PRF of SSN under ultrasound guidance. Use of local anaesthetic and steroid was associated with greater reduction in NRS as compared to PRF. Only patients in ‘BS’ group reported significant reduction in SPADI scores and increase in PROM.

CONCLUSION:
To conclude, SSN block with local anaesthetic and steroid [0.5% bupivacaine 2ml + methylprednisolone 80 mg, 2ml] results in better pain relief compared to PRF of SSN. There was significant improvement in SPADI and PROM in ‘BS’ group. Study was limited by small sample size. Further studies with large sample sizes are needed to study the effectiveness of the two interventions.
A RANDOMIZED PLACEBO CONTROLLED STUDY TO COMPARE THE DURATION OF POSTOPERATIVE ANALGESIA AFTER UPPER LIMB SURGERIES IN PATIENTS RECEIVING SUPRACLAVICULAR BLOCK WITH OF 0.75% ROPIVACAINE ALONE VS 0.5% ROPIVACAINE WITH MAGNESIUM 250MG.

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Paper Id: ISSP072

INTRODUCTION
Prolonged post-operative analgesia after upper limb surgery not only helps in better healing but also reduces morbidity which can be achieved with SuprACLavicular block.

AIMS AND OBJECTIVES
To compare duration of analgesia using ropivacaine with/without magnesium combination in supraclavicular brachial plexus block(SBPB) in patients undergoing upper limb surgeries

MATERIAL AND METHODS
A randomized, double blinded study was conducted on 70 patients of ASA-I-II in the age group of 20-60 years undergoing upper limb surgeries after ethical clearance:
• Group–I (n=35) 27ml of 0.75% Ropivacaine with 3ml normal saline .
• Group–II (n=35) 27ml of 0.5% Ropivacaine with Magnesium Sulphate 250mg (1ml) and 2ml of normal saline. Total volume=30ml.
We compared the duration of analgesia (Onset to VAS reduction upto 4), VAS reduction, rescue analgesia required for 24 hrs and complications.

Results
Both the groups were comparable in age and sex distribution. The duration of analgesia was 6.76 ± 0.92 hours in group I as compared to group II (8.78 ± 0.9 hours) (p<0.001).Quality of analgesia in terms of VAS was better with group II as compared to group I. Number of rescue analgesia doses Group I vs II (2.50 ±0.51vs 1.44 ± 0.61. Complications in both the groups were comparable.

CONCLUSION
Adding adjuvants like magnesium to ropivacaine for SBPB in upper limb surgeries had prolonged and better post operative analgesia as compared to the placebo group.
A COMPARATIVE STUDY- EFFECT OF LOCAL ANAESTHETIC ONLY VS LOCAL ANAESTHETIC WITH STEROID TO STELLATE GANGLION BLOCK IN UPPER EXTREMITY COMPLEX REGIONAL PAIN SYNDROME

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Paper Id: ISSP073

Summary:
Complex Regional Pain Syndrome (CRPS) is characterized by continuing spontaneous or evoked regional pain often disproportionate in time and degree to any trauma or other lesion. Multimodal treatment approach (Pharmacotherapy, Physical therapy, psychotherapy and interventions) is necessary for pain relief and functional restoration. As sympathetic nervous system plays an important role in sustaining the pain in CRPS, Stellate ganglion block (SGB) is regarded as an effective modality of treatment in CRPS of upper limb. In our study we have seen that the efficacy of stelate ganglion block is same using only local anesthetic compared to local anesthetic combined with steroid.

Aims and Objectives:
To compare the efficacy of stellate ganglion block administrating steroid with local anesthetic and only local anesthetic in patients with upper limb CRPS.

Methods:
Inclusion criteria:
1. CRPS in upper extremities according to modified IASP criteria.
2. Age: 18-65 years
3. Pharmacotherapy, Physical therapy trid mor than 12 weeks.
4. NRS more than 5

Exclusion criteria:
1. Cervical radiculopathy
2. pregnancy, ongoing breast feeding,
3. warfarin therapy
4. Systemic illness
5. Vascular insufficiency
After taking ethical permission, CTRI registration and informed consent from patient, total 30 patients of upper limb CRPS after fulfilling the inclusion and exclusion criteria were randomly allocated in two groups:

1. Group R: received SGB with 0.25% bupivacaine only
2. Group S: received SGB with 0.25% bupivacaine and 4mg dexamethasone.

In both groups SGB were repeated for 5 times at one week interval.

Pain in Numeric rating score (NRS) and disability by Modified Gibbson and Wilson score (MGAWS) were recorded for every patient before SGB and after 1 week, 4 week and 6 weeks of SGB.

In our study, after analyzing the data by SPSS software, we found that in both the groups there was significant change in Pain and Disability Score at each of the Post OP time from the Pre OP period. However, there was no significant variation between the 2 groups in Pain and Disability Score at any of the time points.

**Conclusion:**
Steroid can be avoided for SGB as there is no extra advantage of it over local anaesthetic only and thus we can avoid the systemic side effects of steroids.

Financial aid: Nil

Conflict of interest: NIL
ULTRASOUND GUIDED ERECTOR SPINAE PLANE BLOCK FOR MANAGEMENT OF VARIOUS CHRONIC PAIN CONDITIONS

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Paper Id: ISSP074

Introduction

We discuss a series of patients with some challenging chronic painful conditions, who received an ultrasound guided erector spine fascial plane block for pain management. Case 1 is 19 year old female patient operated for kyphoscoliosis correction surgery who presented with severe continuous pain in the right upper back, mid-scapular and right infra-scapular region. Case 2 is 34 year old female with chronic right mastalgia for more than 8 months duration. Case 3 is 38 year old female diagnosed to have bilateral fibrocystic disease of the breast with bilateral mastalgia. Case 4 is 38 year old male patient with muscular back pain in right lower lumbar region since 3 months.

Aim of Investigation

To develop an effective, easy and ambulatory procedure for managing patients with challenging chronic painful conditions

Methods

All patients discussed above received the erector spinae plane block under ultrasound guidance on the side of pain at a single vertebral level with a mixture of injection Bupivacaine (0.125%) and Injection Triamcinolone (40mg) and total volume 10 ml. Adequate spread of the drug superior and inferior to the level was noted. Case 3 who had bilateral pain, received the block on both sides. The vertebral level was decided according to the dermatome corresponding to the painful region.

Results

All 4 patients reported a significant decrease in VAS score and decrease in perceived pain intensity. The patients were also continued on medications and physiotherapy where needed.
Conclusions

The erector spinae block is a novel approach to provide analgesia for the thoracic and lumbar region. Earlier studies have suggested the benefit of using this block in various neuropathic and nociceptive pain conditions. ESP block is technically easier to perform with the use of ultrasound and has relatively less chances of serious complications. All procedures in our series were performed on a day-care basis. The literature available is inadequate for describing the exact mechanism how a single block can break the chronic pain cycle and produce a long lasting effect, and more studies are warranted in this regard.

Acknowledgments / Disclosures:

No disclosures
SUMMARY:
Pain clinics and pain management techniques are an integral part of the department of anaesthesiology, this survey will focus on the knowledge among young anaesthesiologists regarding chronic pain management as a carrier.

AIM
1) To understand the view of young anaesthesiologists about the scope and recent advances in the field of chronic pain management.

2) Importance and availability of pain clinics among other clinical branches (i.e. surgery medicine, ortho, radiotherapy etc)
TO COMPARE THE EFFICACY OF PULSED RADIOFREQUENCY (PRF) ABLATION VS LOCAL ANAESTHETIC STELLATE GANGLION BLOCK (SGB) IN PATIENTS WITH UPPER EXTREMITY COMPLEX REGIONAL PAIN SYNDROME (CRPS)

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Paper Id: ISSP076

AIMS AND OBJECTIVES:
To compare the efficacy of pulsed radiofrequency (PRF) ablation vs local anaesthetic stellate ganglion block (SGB) in patients with upper extremity complex regional pain syndrome (CRPS).

INTRODUCTION:
Neuropathic pain associated with CRPS is very distressing and impairs quality of life significantly. Neuropathic pain can result due to insult of neurons or ganglia following trauma, surgery or may be idiopathic. The SGB is widely used to manage neuropathic pain in the upper extremities. The stellate ganglion (SG) is formed by the fusion of the inferior cervical ganglion and first thoracic sympathetic ganglion. Blind SGB has traditionally been applied to the middle cervical sympathetic ganglions at the C6 level as the vertebral artery runs anteriorly at the C7 level. The vertebral artery may be exposed at the C6 level in some patients, therefore blind SGB could be catastrophic. However, a single sympathetic block often provides only short-term effects. In addition, frequent procedures may result in complications. To overcome the short-term nature of a single sympathetic block, PRF ablation of is now used. In this study, we performed PRF treatment of the SG under ultrasound guidance in patients with CRPS.

MATERIALS AND METHOD:
After approval from the institutional ethics committee and board of studies, JNMCH, AMU; a total of 10 patients, equally divided in to 2 groups of 5 each, were enrolled for this study. Group L received SGB using local anaesthetic and group P underwent PRF of the SG under USG guidance. The NRS scores of participants were evaluated before and immediately after the procedure and again at 1week after the procedure.

OBSERVATIONS AND RESULTS:
Mean NRS scores reduced significantly in both the groups after the procedure, but the duration of pain relief was shorter in the group L, lasting for few weeks while in the group P there was a significantly longer pain-free period (p=0.0001).
CONCLUSION:
Both the interventional procedures i.e, pulsed radiofrequency neuromodulation and local anaesthetic block of stellate ganglion provided significant pain relief in patients of CRPS. PRF of stellate ganglion provided prolonged pain relief. It can be done as an adjunct to pharmacological treatment for neuropathic pain in upper extremity CRPS. However, a prospective study with a larger sample size is highly recommended to evaluate its effects.
A COMPARATIVE STUDY OF DEXEMEDETOMIDINE AND FENTANYL AS INTRATHECAL ADJUVANTS TO 0.5% HYPERBARIC BUPIVACAINE IN INFRAUMBILICAL SURGERIES

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Paper Id: ISSP077

Background:
To assess and compare total dose of rescue analgesic required in first 24 hr with dexmedetomidine and fentanyl as intrathecal adjuvants to 0.5% hyperbaric bupivacaine in infraumbilical surgeries under spinal anaesthesia.

Method:
With institutional ethical committee clearance prospective, randomized, double blind study was conducted. After obtaining informed written consent total of 50 patients scheduled for infraumbilical surgeries were randomly allocated into two groups of 25 patients each. Following a spinal tap, patient received 2.0 ml of 0.5% hyperbaric bupivacaine with 25µg fentanyl (0.5ml) in group A and 5µg dexmedetomidine (0.5ml) in group B intrathecally by adding 0.5ml of normal saline in both the groups and the total volume in the both groups will be 3.0ml. The characteristics of sensory and motor block, hemodynamic data, side effects were recorded.

Results:
There were no significant differences among these two groups for patient demographic, intraoperative hemodynamic parameters and side effects. The two segment regression time was significantly different (p<0.05) between group F (82.24 ± 15.36) and group D (127.44 ± 22.79). The mean time of total duration of motor block in group F was 142.76 ± 24.654 minutes and in group D was 420.64 ± 45.51 minutes respectively. The difference in mean time of total duration of complete motor block was highly significant among these two groups (p value <0.001). The mean time to first rescue analgesia was significantly different (p<0.05) between group F (162.56 ± 25.09) and group D (262.76 ± 48.042).

Conclusion:
Both the regimes are effective, but the duration of sensory block and postoperative analgesia was prolonged in dexmedetomidine as compare to fentanyl group.

Key Words:
Anaesthetic technique; spinal anaesthesia; hyperbaric bupivacaine, analgesics, opioid; fentanyl, dexmedetomidine.
PARAVERTEBRAL BLOCK: METHOD OF PAIN CONTROL IN PATIENTS WITH MULTIPLE FRACTURED RIBS

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Paper Id: ISSP079

INTRODUCTION:

Rib fractures are one of the commonest of all chest injuries identified in trauma patients. Multiple rib fractures (MFR) cause severe pain that can seriously compromise respiratory mechanics and exacerbate underlying lung injury. Analgesia could be provided using systemic analgesics or regional analgesic techniques, like intercostal nerve blocks, thoracic epidural blocks or thoracic paravertebral block (TPVB). TPVB is one of the effective techniques for providing analgesia in the management of multiple rib fractures. It produces multidermatomal ipsilateral somatic and sympathetic nerve blockade in contiguous thoracic dermatomes, without potential risk of hypotension and motor block.

We assessed visual analog score (VAS), respiratory rate and arterial oxygen saturation (SpO2) as our primary objectives. Secondary objectives were requirement of rescue analgesics and complications if any.

MATERIALS AND METHODS:

After approval by the institutional ethics committee, 30 adult trauma patients who had been referred to the the pain care division of JSS Medical College Hospital for the management of pain caused by unilateral MFR were prospectively enrolled in the study. 15 were explained about TPVB and written informed consent was taken. Others were give TID 50mg tramadol with rescue analgesic – Fentanyl.

- BP and heart rate were recorded at 5, 10, 15, 30 and 60 minutes, and any procedure-related complications were noted.
- The following parameters were measured Pre-TPVB, Post-TPVB 30 min, and follow up Day 1, 2 & 3:
  - VAS pain score at rest and on coughing;
  - Respiratory rate;
  - Arterial oxygen saturation (Spo2)
- Rescue analgesia was provided by IV Tramazac 50 mg when VAS pain score > 4. Number of patients requiring rescue analgesia were noted.
- If VAS > 6, and if patient willing repeat TPVB was performed.
- Breathing exercises and regular chest physiotherapy was given.
RESULTS:

- There was significant improvement in VAS scores measured both at rest (p<0.01) and during coughing (p<0.01) at 0.5 hrs post TPVB, and sustained for all 3 days of follow up (p< 0.01).
- There was improvement in Sao2 (p < 0.05) and decrease in respiratory rate (p < 0.05) and sustained (p <0.05) for 3 days.
- Patients were haemodynamically stable and there were no complications.

CONCLUSIONS:

Single shot Thoracic Paravertebral Block is a reliable, effective & safe technique. It offers much promise as a regional analgesic method for pain control in patients with unilateral multiple rib fracture.
Distinguish Trigeminal Neuralgia from various other facial pain and Headache syndromes.