ASSESSMENT AND DIAGNOSIS
Overview
Pain: Underreported, Underdiagnosed and Undertreated

• Ongoing pain has been underreported, underdiagnosed, and undertreated in nearly all health care settings
• Individuals with pain that reduces quality of life should be encouraged to seek help
• Comprehensive assessment and treatments likely to produce best results

Importance of Pain Assessment

Pain is a significant predictor of morbidity and mortality.

- Screen for red flags requiring immediate investigation and/or referral
- Identify underlying cause
  - Pain is better managed if the underlying causes are determined and addressed
- Recognize type of pain to help guide selection of appropriate therapies for treatment of pain
- Determine baseline pain intensity to future enable assessment of efficacy of treatment

Characterize pain location, distribution, duration, frequency, quality, precipitants

Take detailed history (e.g., comorbidities, prior treatment)

Conduct physical examination

Assess effects of pain on patient’s function

Complete risk assessment

Clarity etiology, pathophysiology

### Nociceptive vs. Neuropathic Pain

<table>
<thead>
<tr>
<th></th>
<th>Nociceptive</th>
<th>Neuropathic</th>
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</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>Pain caused by physiological activation of pain receptors</td>
<td>Pain initiated or caused by a primary lesion or dysfunction in the peripheral or central somatosensory nervous system</td>
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<tr>
<td><strong>Mechanism</strong></td>
<td>Natural physiological transduction</td>
<td>Ectopic impulse generation, central sensitization, and others</td>
</tr>
<tr>
<td><strong>Localization</strong></td>
<td>Local + referred pain</td>
<td>Confined to innervation territory of the lesioned somatosensory nervous structure</td>
</tr>
<tr>
<td><strong>Quality of symptoms</strong></td>
<td>Ordinary painful sensation</td>
<td>New strange sensations</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td>Good response (conventional analgesics)</td>
<td>Poor response (conventional analgesics)</td>
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</tbody>
</table>

Nociceptive Pain

**Somatic**
- Musculoskeletal injury
- Burn pain
- Post-operative pain
- Infection, e.g., pharyngitis

**Visceral**
- Ischemic, e.g., myocardial infarction
- Abdominal colic
- Dysmenorrhea

Recognizing Neuropathic Pain

Common descriptors:
- Shooting
- Electric shock-like
- Burning
- Tingling
- Numbness

Post-stroke pain
Diabetic peripheral neuropathy
Lumbar radicular pain
Postherpetic neuralgia
Chronic post-surgical pain

History
Pain History

- Location/distribution
- Onset
- Frequency/variation
- Intensity
- Type
- Aggravating and relieving factors
- Impairment and disability
- Previous pain treatments
- Other conditions/treatments
- Response to treatment
- Meaning of pain
Pain History Worksheet

- Site of pain
- What causes or worsens the pain?
- Intensity and character of pain
- Associated symptoms?
- Pain-related impairment in functioning?
- Relevant medical history

Body maps are useful for the precise location of pain symptoms and sensory signs.*

*In cases of referred pain, the location of the pain and of the injury or nerve lesion/dysfunction may not be correlated.*

## Clinical Assessment of Pain

<table>
<thead>
<tr>
<th>Functional Assessment</th>
<th>Psychological Assessment</th>
<th>Medication History</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the pain interfere with activities?</td>
<td>Does the patient have concomitant depression, anxiety, or mental status changes? Does the patient have sleep disorders or a history of substance abuse/dependence?</td>
<td>What medications have been tried in the past? Which medications have helped? Which medications have not helped?</td>
</tr>
</tbody>
</table>

Evaluate Impact of Pain on Functioning

Anxiety and depression

Pain Assessment: PQRST Mnemonic

- **P**rovocative and **P**alliative factors
- **Q**uality
- **R**egion and **R**adiation
- **S**everity
- **T**iming, **T**reatment
Pain Assessment Tools

Unidimensional Tools

• Visual Analog Scale
• Verbal Pain Intensity Scale
• Faces Pain Scale
• 0–10 Numeric Pain Intensity Scale

Multidimensional Tools

• Brief Pain Inventory
• McGill Pain Questionnaire

Determine Pain Intensity

Simple Descriptive Pain Intensity Scale

0–10 Numeric Pain Intensity Scale

Faces Pain Scale – Revised

Brief Pain Inventory

FORM 2.2 Brief Pain Inventory

Date: / / Time: __________

Name: ____________________________

1) Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, and toothaches). Have you had pain other than these everyday kinds of pain today?

1. Yes 2. No

2) On the diagram shade in the areas where you feel pain. Put an X on the area that hurts the most.

3) Please rate your pain by circling the one number that best describes your pain at its worst in the past 24 hours.

0 1 2 3 4 5 6 7 8 9 10
No pain pain as bad as you can imagine

4) Please rate your pain by circling the one number that best describes your pain at its least in the past 24 hours.

0 1 2 3 4 5 6 7 8 9 10
No pain pain as bad as you can imagine

5) Please rate your pain by circling the one number that best describes your pain on the average.

0 1 2 3 4 5 6 7 8 9 10
No pain pain as bad as you can imagine

6) Please rate your pain by circling the one number that tells how much pain you have right now.

0 1 2 3 4 5 6 7 8 9 10
No pain pain as bad as you can imagine

7) What treatments or medications are you receiving for your pain?

8) In the Past 24 hours, how much relief have pain treatments or medications provided? Please circle the one percentage that most shows how much relief you have received.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100% Complete relief

9) Circle the one number that describes how, during the past 24 hours, pain has interfered with your:

A. General activity

B. Mood

C. Walking ability

D. Normal work (includes both work outside the home and housework)

E. Relations with other people

F. Sleep

G. Enjoyment of life

Neuropathic Pain Screening Tools

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>LANSS</th>
<th>DN4</th>
<th>NPQ</th>
<th>painDETECT</th>
<th>ID Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pricking, tingling, pins and needles</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Electric shocks of shooting</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot or burning</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numbness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain evoked by light touch</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain evoked by cold touch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical examination</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Select tool(s) based on **ease of use and validation in the local language**

DN4 = Douleur Neuropathique en 4 Questions (DN4) questionnaire; LANSS = Leeds Assessment of Neuropathic Symptoms and Signs; NPQ = Neuropathic Pain Questionnaire

### Sensitivity and Specificity of Neuropathic Pain Screening Tools

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Sensitivity*</th>
<th>Specificity*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interview-based</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPQ</td>
<td>10 sensory-related items + 2 affect items</td>
<td>66%</td>
<td>74%</td>
</tr>
<tr>
<td>ID-Pain</td>
<td>5 sensory items + 1 pain location</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>painDETECT</td>
<td>7 sensory items + 2 spatial characteristics items</td>
<td>85%</td>
<td>80%</td>
</tr>
<tr>
<td><strong>Interview + physical tests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LANSS</td>
<td>5 symptom items + 2 clinical exam items</td>
<td>82–91%</td>
<td>80–94%</td>
</tr>
<tr>
<td>DN4</td>
<td>7 symptom items + 3 clinical exam items</td>
<td>83%</td>
<td>90%</td>
</tr>
</tbody>
</table>

Tests incorporating both interview questions and physical tests have higher sensitivity and specificity than tools that rely only on interview questions.

*Compared with clinical diagnosis
DN4 = Douleur neuropathic en 4 questions; LANSS = Leeds Assessment of Neuropathic Symptoms and Signs; NPQ = Neuropathic Pain Questionnaire; NR = not reported
LANSS Scale

- Completed by physician in office
- Differentiates neuropathic from nociceptive pain
- 5 pain questions and 2 skin sensitivity tests
- Identifies contribution of neuropathic mechanisms to pain
- Validated

LANSS = Leeds Assessment of Neuropathic Symptoms and Signs
The NPQ has been developed to assess patients’ neuropathic pain symptoms and to discriminate between neuropathic and non-neuropathic pain. The NPQ measures similar items to the other questionnaires, but also assesses circumstances that cause change in pain (e.g., touch). Further research is required to determine its clinical usefulness and distinguish it from the other questionnaires.

NPQ = Neuropathic Pain Questionnaire

DN4

- Completed by physician in office
- Differentiates neuropathic from nociceptive pain
- 2 pain questions (7 items)
- 2 skin sensitivity tests (3 items)
- Score $\geq 4$ is an indicator for neuropathic pain
- Validated

DN4 = Douleur neuropathique en 4 questions
painDETECT

- Patient-based, easy-to-use screening questionnaire
- Developed to distinguish between neuropathic pain and non-neuropathic pain*
- Validated: high sensitivity, specificity and positive predictive accuracy
- Seven questions about quality and three about severity of pain
- Questions about location, radiation and time course

*Validation was in patients with low back pain
ID Pain

- Patient-completed screening tool
- Includes 6 yes/no questions and pain-location diagram
- Developed to differentiate between nociceptive and neuropathic pain
- Validated

Physical Examination
Comprehensive Physical Examination Is Important

• Conduct comprehensive physical and neurological exams when evaluating and identifying patient’s subjective complaints of pain¹
  – Should serve to verify preliminary impression from history and guide the selection of laboratory and imaging studies²

• Confirm or exclude underlying causes

Examples of Bedside Tests for Neuropathic Pain

- **Touch tests can detect**
  - Differences in skin temperature
  - Hypersensitivity
  - Unpleasant abnormal sensations
  - Sensory deficit

- **Tests to evoke pain**
  - Response is the presence of positive sensory symptoms
  - Examples include touch, pinprick, pinch, and etiology-specific tests

Look: Simple Bedside Tests

Stroke skin with brush, cotton or apply acetone

Light manual pinprick with safety pin or sharp stick

Sharp, burning superficial pain → ALLODYNIA

Very sharp, superficial pain → HYPERALGESIA

Imaging and Other Tests
Pain Diagnostics

• Plain X-rays with multiple views
• MRI
• CT
• CT myelogram
• Nerve conduction velocity
• Electromyography

CT = computed tomography; MRI = magnetic resonance imaging
Newer Neuropathic Pain Assessment Techniques

- Newer, more objective assessment techniques for neuropathic pain include:
  - Laser-evoked potentials
  - Skin biopsy
  - Quantitative sensory testing

Arrows = IENFs, arrowheads = dermal nerve bundles. Bright-field immunohistochemistry in 50 µm sections stained with anti-PGP 9.5 antibody. Bar = 80 µm.

IENF = intra-epidermal nerve fiber

Laser-Evoked Potentials

How They Work

• Detect dysfunction of pain and temperature pathways, which are the basis of neuropathic pain development

• Laser-generated radiant heat pulses selectively excite free nerve endings in the superficial skin layers

• Brain responses are recorded

• Late laser evoked potentials reflect activity of Aδ nerve endings in superficial skin layers

• Laser evoked potential magnitudes may accurately gauge subjective experience of pain

Potential Place in Practice

• Easiest, most reliable, and most sensitive neurophysiological way to assess the function of nociceptive pathways

• EFNS has recommended the use of laser evoked potentials as an ancillary tool in the evaluation of neuropathic pain

• Use in diagnosis currently limited by availability of equipment

EFNS = European Federation of Neurological Societies
Skin Biopsy

- Circular punch is used to excise a hairy skin sample, usually from distal part of the leg
- Lidocaine used as a topical anesthetic
- No sutures are required
- No side effects
- Wound heals quickly

Quantitative Sensory Testing

How It Works

- Involves measuring the responses evoked by mechanical and thermal stimuli of controlled intensity
- Stimuli are applied to the skin in ascending and descending order
  - Mechanical sensitivity: assessed using plastic filaments and pin prick sensation with weighted needles
  - Vibration sensitivity: assessed using an electronic vibrameter
  - Thermal sensitivity: assessed using a probe that operates on a thermoelectric principle

Limitations

- Relies on the patient’s subjective assessment of pain
- Outcomes of quantitative sensory testing and bedside testing do not necessarily coincide
- Quantitative sensory testing abnormalities cannot be taken as conclusive demonstration of neuropathic pain because they also occur in other conditions, such as rheumatoid arthritis
- Time consuming and requires expensive equipment
- Results can be influenced by various factors (e.g., model or make of equipment, room temperature, site of stimulus, patient characteristics)

Diagnosis
Pain Diagnosis

• Confirm or exclude underlying causes
• There is no single diagnostic test for pain
• Multiple tests may not be helpful
Whenever possible, it is important to identify and treat the underlying cause of pain!

Evaluate for patients presenting with pain the presence of red flags!

Initiate appropriate investigations/management or refer to specialist

Assessment and Diagnosis: Summary

• Assessment of pain is critical and should include:
  – Location, duration, frequency, quality, severity, etc.
  – Medication history
  – Physical exam
  – Assessment of patient function
  – Psychological assessment
  – Risk assessment
  – Comorbidities
  – Determination of type(s) of pain