Evaluation and Management of Low Back Pain in the Primary Care Clinic

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  and
- University of Washington School of Medicine, MEDEX Division
Acute low back pain (LBP)

- common reasons for adults to seek care
- most patients recover quickly with minimal treatment
- evaluation is mainly to rule out serious underlying pathology.
- Watch for red flags.
Red Flags in acute LBP

• significant trauma (particularly in an older patient with osteoporosis)
• progressive motor or sensory deficit
• new-onset bowel or bladder incontinence, or urinary retention, loss of anal sphincter tone, saddle anesthesia, history of cancer and possible metastatic bone lesions
• Risk for infection (immunocompromised)
Treating acute LBP

- Without clinical signs, imaging not required.
- There are numerous treatments for nonspecific acute LBP (most with little evidence of benefit)
- Patient education is KEY – Do NOT blow the patient off!!
Treating acute LBP

- Meds: nonsteroidal anti-inflammatory drugs, acetaminophen, and +/- muscle relaxants (no Soma)
- Opioids do not improve pain relief or time to return to work over NSAIDs/acetaminophen
- Physical therapy for spinal stabilization exercises
- Osteopathic and chiropractic spinal manipulation are effective when used judiciously
Remarkably little documented benefit from:

- taking a course of oral steroids
- Acupuncture
- Massage
- traction,
- lumbar corset
- epidural steroid injections (for isolated acute LBP)
Acute Treating acute LBP with radiculopathy

- A totally different animal
- May need imaging, including magnetic resonance
- Electrodiagnosis
- Treatment dictated by severity
Chronic LBP

- Also a totally different animal
- Factors include disc degeneration, osteoporosis causing inflammation in joints and discs
- Age with loss of muscle elasticity
- Chronic sprains and strains producing spasm in muscles or ligaments in the back.
- Chronic nerve root irritation
Risk factors for chronic LBP

- Obesity
- Smoking
- Weight gain during pregnancy
- Stress
- Deconditioning/sedentary lifestyle
- Non-restorative sleep patterns
What is “Chronic Pain”

- According to the International Association for the Study of Pain (IASP) it is

- "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage"
Further Defining Pain

- Acute vs. Chronic
- Neuropathic vs. Nociceptive
- Musculoskeletal
- Pathological vs. Functional
- Organic vs. Somatic
Classification of Pain

Duration

- Acute
- Chronic

Pathophysiology

- Nociceptive
- Neuropathic
**Acute vs Chronic Pain States**

**Acute**
- Usually accompanied by obvious tissue damage
- Increased autonomic nervous activity
- Pain resolves with healing of the underlying injury
- Serves a protective function

**Chronic**
- Pain that extends 3 or 6 months beyond onset or beyond the expected period of healing\(^1\)
- Ceases to serve a protective function\(^2\)
- Degrades health and functional capability\(^2\)
- Depressed mood\(^3\)

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Nociceptive vs Neuropathic Pain States

Nociceptive

- Pain that arises from a stimulus that is outside of the nervous system
- Proportionate to the stimulation of the receptor
- When acute serves a protective function

Neuropathic

- Pain initiated or caused by a primary lesion or dysfunction in the nervous system
- No nociceptive stimulation required
- Disproportionate to the stimulation of receptor
- Other evidence of nerve damage
- PHN is classified as neuropathic pain
Pain-Sensing System Malfunction in Chronic Pain

**Normal pain:**
Pain-sensing signals are initiated in response to a stimulus
• They elicit a pain-relieving response

**Chronic pain:**
Pain signals are generated for no reason and may be intensified
• Pain-relieving mechanisms may be defective or deactivated

In chronic pain, pain signals are generated without physiologic significance

Pathogenesis of Chronic Pain

1. Injury
   - Pain and inflammation
     - Injury heals but pain signals continue
       - Structural CNS changes alter neural transmission
         - Chronic pain
         - Allodynia
         - Hyperalgesia
         - Spread of pain

(Adapted from Marcus, 2000)
Chronic Pain Pathophysiology

- The nervous system remolds continuously in response to repeated pain signals
  - Nerves become hypersensitive to pain
  - Nerves become resistant to anti-nociceptive system
- If untreated, pain signals will continue even after injury resolves
- Chronic pain signals become embedded in CNS

(Marcus, 2000)
Epidemiological and Historical Perspective

- Incidence/Prevalence of Chronic LBP
- Economic Impact
- Societal Impact
- What are the Medical and Regulatory Guidelines?
Chronic Pain: Prevalence and Impact

- 35% of Americans have chronic pain
- >50 million Americans are partially or totally disabled by chronic pain
- 50 million lost workdays per year
- $65 to $75 billion per year cost to society in lost productivity and medical costs

(APS, 1999)
Taking a History

- Where it hurts
- When it hurts
- How bad it hurts
- What it feels like
- What makes it better or worse
- Depressed? History of Abuse?
Determine type(s) of pain

• Then see what further diagnostic tests are indicated

• ALWAYS review old medical records when treating CHRONIC LBP – do not assume patient remembers work-up or medication history correctly
Nociceptive Pain

- Somatic Pain Sources: - muscle, joints, bones, and ligaments –

- mechanical or musculoskeletal pain involves receptor activation (nociceptors) for heat, cold, vibration, stretch (muscles), inflammation (e.g. sprains which cause tissue disruption), and oxygen starvation (ischemic muscle cramps).

- injury or repetitive traumatic activities? type of work

- With mechanical pain may see abnormal biomechanics

- Body habitus: obesity, lordosis
Neuropathic (non-nociceptive) Pain

- Not typically seen in chronic LBP
- Pain is being generated directly by nerve cell dysfunction within the peripheral and central nervous system.
- Is a neuropathy present?
- Is autonomic dysfunction prominent?
Office Visits

- At a minimum:
- SOAP:
- pain is 5\textsuperscript{th} vital sign
- Include Four \textbf{A}'s: \textbf{A}nalgesia, \textbf{A}ctivities, \textbf{A}dverse reactions, \textbf{A}berrant behavior
- Document FUNCTIONALITY
APPROACHING CHRONIC LBP

- Targeted Pain Management
- Anti-epileptics
- Anti-depressants
- Opioids
**Targeted pain management**

- non-steroidal anti-inflammatory drugs (NSAIDs) are OK periodically for nociceptive pain: do not use long term uninterrupted due to kidney damage.

- Mild/moderate mechanical pain: acetaminophen - do not exceed 3 grams daily due to hepatotoxicity.
Targeted pain management

- Anti-epileptic drugs (AEDS): gamma-amino-butyric acid (GABA) mediators (pregabalin, gabapentin)
- These meds also work for central pain syndromes and may partially help with muscle spasms too
- Most “muscle relaxers” are too sedating to be effective – may help with sleep though
Utilize combinations of medications to hit more pain targets

**Peripheral Sensitization**

- PNS
  - Na⁺
  - GBP
  - OXC
  - CBZ
  - TCA
  - TCA
  - TPM
  - LTG
  - Mexiletine
  - Lidocaine

**Central Sensitization**

- **Ca²⁺**: GBP, OXC, LTG, LVT
- **NMDA**: Ketamine
  - Dextromethorphan
  - Methadone
- **Others**
  - Capsaicin
  - NSAIDs
  - Cox inhibitors
  - Levodopa

**Descending Inhibition**

- NE/5HT
- Opiate receptors

**BRAIN**

- TCAs
- SSRIs
- SNRIs
- Tramadod
- Opiates

**SPINAL CORD**
Depression and Chronic LBP

- Anti-depressants work locally in rat model of nerve pain
- Also help improve sleep
- Chicken or egg? Pain/sleep/depression all inter-related in a complex manner
- Analgesic effects appear independent from effect on mood
## Tri-cyclic Antidepressants in Chronic LBP

<table>
<thead>
<tr>
<th>Study</th>
<th>n</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitriptyline vs placebo</td>
<td></td>
<td>P: 5%</td>
</tr>
<tr>
<td>Amitriptyline vs placebo</td>
<td></td>
<td>P: 8%</td>
</tr>
<tr>
<td>Kishore-Kumar et al (1980)</td>
<td>19</td>
<td>D: 63%</td>
</tr>
<tr>
<td>Desipramine vs placebo</td>
<td></td>
<td>P: 11%</td>
</tr>
<tr>
<td>Amitriptyline vs maprotiline</td>
<td></td>
<td>M: 18%</td>
</tr>
<tr>
<td>Watson and Evans (1985)</td>
<td>15</td>
<td>A: 60%</td>
</tr>
<tr>
<td>Amitriptyline vs zimeldine (SSRI)</td>
<td></td>
<td>Z: 7%</td>
</tr>
</tbody>
</table>

### Common Side Effects Associated With Tricyclic Antidepressants

<table>
<thead>
<tr>
<th></th>
<th>Sedation</th>
<th>Anti-cholinergic effects</th>
<th>Hypotension</th>
<th>Cardiac effects</th>
<th>Seizures</th>
<th>Weight gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitriptyline</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Clomipramine</td>
<td>++</td>
<td>+++</td>
<td>++</td>
<td>+++</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Desipramine</td>
<td>0/+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Nortriptyline</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

0/+ = minimal; +/- mild; ++ = moderate; +++ = moderately severe.

Treating Depression in the setting of chronic LBP

- Older anti-depressants better studied but...
- Newer agents have less side effects, thus have better compliance
- Newer agents appear just as effective for pain
- Duloxetine 60 mg PO daily (FDA approved for Fibromyalgia)
- Venlaflaxine extended release 150 mg PO Daily
- If sexual side effects add buproprion 75 mg PO daily
Muscle relaxers?

- Very sedating
- Do not actually “relax” muscle
- Cyclobenzaprine initially marketed as an anti-depressant
- Carisoprodol (Soma) is a BAD ACTOR: metabolized in to meprobamate
FINALLY OPIOIDS: Pros/Cons/Risks/Benefits

- Good analgesia vs dependence
- High dosing ceiling vs toxicity
- Risk for addiction
- Drug-drug interactions
OPIOIDS WORK

• BUT you must follow the rules
• Establish protocols
• Patient contracts
• Monitor closely
• First, the bad stuff...
Misuse Potential of Opioids: A 3-Year Retrospective Review

Ratio of misuse/appropriate use

- Butorphanol: 4.4
- Propoxyphene: 2.5
- Hydrocodone: 1.45
- Codeine with acetaminophen: 1.61
- Oxycodone: 1.35
- OxyContin: 0.73
- MS Contin: 0.66
- Duragesic: 0.23
- Methadone: 0.08

(Mironer, 2000)
Opioid Mentions in Drug Abuse Warning Network (DAWN) Reports, 1990-96

DAWN recorded illicit drug-use incidents resulting in ER Visits at ~500 Urban Hospitals

- Opioids surveyed: fentanyl (all formulations), hydromorphone, meperidine, morphine, oxycodone
- Opioids accounted for <4% of total DAWN mentions
- Opioid drug mentions decreased by 25% from 1990 to 1996
- Year 2000 update shows increase in oxycodone mentions to 10,800 (1.8% of total) compared to 291 fentanyl mentions (.05% of total)

(Joranson, 2000; DAWN, 2000)
Issues That Complicate Opioid Prescribing

- Physician-patient agreement
- Fear of iatrogenic addiction
- Differentiating addictive vs other aberrant behaviors
- Management strategies for patients with substance-abuse-related problems
- Concern over regulatory scrutiny and ability to identify those who are seeking opioids for non-medical reasons (diversion, sale, recreation)
The Physician-Patient Agreement

- Build trust by using a patient agreement that defines what behaviors constitute responsible drug-taking:
  - Get medicine from only one prescriber and one pharmacy
  - Take medications only as prescribed
  - Refills for lost medicine cannot be given by staff or over the phone but require a visit to the prescribing physician
  - Do not take other non-prescribed medications or share your medications with others
  - Keep all appointments, including those with other professionals (psych, PT, marriage counselor)
  - Set and progress toward goals that improve your life
  - Specify the possibility of random urine screens. If illicit drugs are identified, note that police will be notified.
Positive Outcomes in Pain Management: Analgesia and Activities of Daily Living

- Document pain status:
  - Use 1 – 10 Numerical Pain Relief Scale (NPS)
  - Visual Analog Scale for Pain Intensity (VAS)
- Set goals related to ADLs:
  - Physical functioning
  - Mood
  - Family relationships
  - Social relationships
  - Sleep patterns
  - Overall functioning
- Document BOTH pain relief and progress toward ADL goals

(Passik, 1998)
# Essential Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Physical Dependence</td>
<td>Pharmacologic effect characteristic of opioids; withdrawal or abstinence syndrome manifest on abrupt discontinuation of medication</td>
</tr>
<tr>
<td>Tolerance</td>
<td>Pharmacologic effect characteristic of opioids; need to increase dose to achieve the same effect or diminished effect from same dose</td>
</tr>
<tr>
<td>Pseudo-Addiction</td>
<td>Pattern of drug-seeking behavior of pain patients receiving inadequate pain management that can be mistaken for addiction; resolves with reestablishing analgesia</td>
</tr>
<tr>
<td>Addiction</td>
<td>A chronic, relapsing condition resulting from many complicated influences including chemical, genetic, familial and social factors</td>
</tr>
<tr>
<td>Chemical Coping</td>
<td>Behavior bears a resemblance to addiction because pill-taking is inappropriately used to manage stress</td>
</tr>
</tbody>
</table>

# Behaviors That Raise Suspicion of Addiction/Abuse

<table>
<thead>
<tr>
<th>Probably more predictive</th>
<th>Probably less predictive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling prescription drugs</td>
<td>Aggressive complaining about need for higher doses</td>
</tr>
<tr>
<td>Prescription forgery</td>
<td>Drug hoarding during periods of reduced symptoms</td>
</tr>
<tr>
<td>Stealing or borrowing another patient's drugs</td>
<td>Requesting specific drugs</td>
</tr>
<tr>
<td>Injecting oral formulation</td>
<td>Acquisition of similar drugs from other medical sources</td>
</tr>
<tr>
<td>Obtaining prescription drugs from non-medical sources</td>
<td>Unsanctioned dose escalation 1 to 2 times</td>
</tr>
<tr>
<td>Concurrent abuse of related illicit drugs</td>
<td>Unapproved use of the drug to treat another symptom</td>
</tr>
<tr>
<td>Multiple unsanctioned dose escalations</td>
<td>Reporting psychic effects not intended by the clinician</td>
</tr>
<tr>
<td>Recurrent prescription losses</td>
<td></td>
</tr>
</tbody>
</table>

(Portenoy, 1997)
Treatment Plans To Reduce Risk in Patients With Higher Abuse Potential

- Select opioids with lower abuse potential
- Have patients sign written contracts
  - Use contract as a teaching tool, informed consent
- Schedule frequent clinic visits
- Prescribe small quantities of medications
- Renew prescriptions contingent upon clinic attendance
- Use 12-step programs where possible
- Consider urine toxicology screens
- Involve family in treatment planning
- Document all concerns
- Refer to addiction specialist

(Passik, 1998)
If you choose to use a opioid...

- Always screen the patients – see ref*
- Use on with low abuse potential
- Use one with good efficacy
- Use on the provides long term relief
- Use a route the minimizes side effects

There is more than one flavor...how do we pick the right one??

- Short acting vs Sustained release
- Oral vs transdermal meds
- Meds that are long acting by nature
Sustained-release capsules

  - Sustained release morphine worked in patients with chronic, non-malignant pain. Patients had a wide range of pain conditions: both nociceptive and neuropathic.
  - Median daily dose was 60 mg
  - Mean pain scores (visual numeric scale of 0-10) reduced from 7.7 to 4.9. Sustained release morphine use did not result in escalation of dose strength or frequency, and was safe and efficacious regardless of patient age.
What about methadone?

- Long half-life for analgesia
- Even longer for respiratory suppression
- Not completely metabolized by the liver on first pass
- Very inexpensive
- Has less street value
Other ways to deliver opioid medication

- Transdermal (Duragesic)
- Inhalation (stadol)
- Intrathecal pump
- Intravenous pump (in hospital setting only)
# Advantages of Transdermal Delivery

<table>
<thead>
<tr>
<th>Science</th>
<th>Clinical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fentanyl depot in upper layers of skin permits sustained, gradual release directly into systemic circulation</td>
<td>Up to 3 days (72 hours) of pain relief^1</td>
</tr>
<tr>
<td></td>
<td>Consistent serum levels^1</td>
</tr>
<tr>
<td>Minimizes peaks and troughs, compared to opioids dosed every 4, 6, 8, or 12 hours</td>
<td>Few nighttime awakenings^2</td>
</tr>
<tr>
<td></td>
<td>Less daytime drowsiness^3</td>
</tr>
<tr>
<td></td>
<td>Improved morning vigilance^3</td>
</tr>
<tr>
<td>Fentanyl enters directly into systemic circulation:</td>
<td>Improved bioavailability over oral opioid formulations^1</td>
</tr>
<tr>
<td>No GI transit^1</td>
<td>Low incidence of constipation^4</td>
</tr>
<tr>
<td>No first-pass metabolism in liver^1</td>
<td></td>
</tr>
</tbody>
</table>

Duragesic®: Fentanyl Transdermal System
delivers fentanyl directly to circulation

- Fentanyl gelled with hydroxyethyl cellulose in drug reservoir
- Fentanyl in controlled-release membrane
- Fentanyl direct to systemic circulation

(Adapted from 1. Jeal, 1997; 2. Southam, 1995)
Goals of Opioid Titration - 1

- Dose titration over time is critical to successful opioid therapy
- Gradually increase dose until pain relief is adequate or until unacceptable side effects occur
- A “correct” dose is one that best controls the pain without unacceptable side effects
- Responsiveness of an individual patient to a specific drug varies

Goals of Opioid Titration – 2

• There is no ceiling dose for opioids. Titrate the dose upward to obtain maximum pain relief without unacceptable side effects. Always prescribe rescue medication for breakthrough pain.

• If a patient does not respond well on one opioid, it is important to try another.

• Set the patient’s goals and expectations properly at the outset of therapy.

(Passik, 1998)
## Step 2: Anticipate and Manage Side Effects

<table>
<thead>
<tr>
<th>Problem</th>
<th>Clinical Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea/Vomiting</td>
<td>Use antiemetics as needed</td>
</tr>
<tr>
<td>Itching</td>
<td>Prescribe antihistamines as needed</td>
</tr>
<tr>
<td>Sedation</td>
<td>Tolerance to side effects usually develops within a few days</td>
</tr>
<tr>
<td>Constipation</td>
<td>Start a bowel regimen</td>
</tr>
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  - Mood
  - Family relationships
  - Social relationships
  - Sleep patterns
  - Overall functioning

- Document BOTH pain relief and progress toward ADL goals

(Passik, 1998)
Summary of Opioid Prescribing

- Remember the four “A’s”:
  - Analgesia
  - ADLs
  - Adverse Effects
  - Aberrant Usage
Summary of Opioid Prescribing—cont’d

• Use proper documentation
• consult when necessary - in WA state that means when morphine-equivalent dose [MED] is > 120 mg/day
• Watch for drug-drug interactions – esp: benzodiazepines!
• Start LOW, go SLOW –esp in elderly
Summary of Opioid Prescribing - cont

- Always watch for constipation and respiratory depression
- In elderly really watch for confusion, ataxia (increased fall risk)
- Always do random u/a’s
- Always use pain contract
- Try to use long acting whenever possible: less peaks and troughs, which foster drug hunger
Remember:

• It is always possible to wean off opioids
• Withdrawal is rarely life threatening
• Methadone can cause cardiac arrhythmia
• Opioid induced hyperalgesia syndrome: Validated in animal studies; Rigorous research in humans is lacking
UW TelePain Case Conferences every Wednesday

- 12.00pm to 1.30pm led by David Tauben, MD, Director of Pain Division
  Clinical Update & Presentation You may present a chronic pain case to the UW panel of pain specialists.

- UW School of Medicine grants 1.5 AMA PRA Category 1 Credits per session
For more information Contact:

• Cara Towle, RN MSN
• Director, Telehealth Services; University of Washington School of Medicine
• 206-459-7956 or ctowle@uw.edu
• “It is easier to find men who will volunteer to die, than to find those who are willing to endure pain with patience”
Julius Caesar