Pharmacology of Pain and Considerations in Older Adults in the Community and Long Term Care

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Disclosure

• Tanya Uritisly has nothing to disclose
Learning Objectives

• Identify different types of pain and their typical presentation in an older adult.
• Discuss the different pain severity assessment scales and implications for use in the cognitively impaired patient
• When presented a case, choose appropriate pharmacologic therapies for pain management in the older adult.
What a Pain!

- 70% of cancer-related deaths are in people over the age of 65
- Older adults are at highest risk for cancer related pain
- Under-treated pain can lead to altered mental status (AMS) and increased risk of falls
- So let’s talk about pain management!

Pain in the Older Adult

- Occurs in 45-85% of older adults
- No gender difference in global pain amongst 65-80 year olds
- May be under-reported
- Sparse data
- Older adults with dementia or in late stage disease → “vulnerable subjects”
- Under-treatment may lead to reduced QOL, decreased socialization, sleep disturbances, cognitive impairment, disability, and malnutrition

Under-reported pain on this and the next slide - do we need to keep on both?

so i think the context is different - as in here it is underreported in the literature; on the next slide it is under-reported by older adults themselves during assessments
Pain Management Challenges

• Underreporting of pain
• Multiple medical co-morbidities
• Higher incidence for medication associated adverse effects
• Higher potential for treatment related complications
• Difficulty with communicating pain
  • Cognitive impairment
  • Hearing difficulties
• Metabolic changes associated with aging
Pain Impact on Quality of Life

- Physical
  - Function
  - Strength
  - Sleep
  - Appetite
- Social
  - Caregiver burden
  - Relationships
  - Isolation
  - Sexual function
  - Healthcare costs
- Psychological
  - Anxiety
  - Fear
  - Concentration/memory
  - Depression
- Spiritual
  - Punishment from God
- Cultural
  - Stoicism due to cultural beliefs

Van der Leeuw G, et al. J of Pain, 2018; doi10.1016/j.jpain.2018.06.009
Sources of Pain in the Older Adult

- Musculoskeletal/chronic pain
  - Back Pain
  - Joint Pain
- Acute pain/post-operative pain
- Headache
- Leg cramps/restless legs
- Nerve pain (neuropathic pain)
  - Diabetes
  - Herpes Zoster
  - Nerve injury from surgery/amputations
- Cancer pain
Types of Pain

• Nociceptive pain
• Neuropathic (nerve) pain
• Cancer-related pain
• Combination pain
Interactive Audience Question

Which of the following is true about BOTH acute and chronic pain?

A. Objective signs are common (BP, HR changes)
B. There is a known etiology
C. The pain is proportionate to the cause
D. There may be an emotional component
Pain Duration: Acute vs. Chronic

**Acute**
- Brief duration
- Known etiology
- Pain is proportionate to cause
- Objective signs
- Emotions (anxiety, fear, frustration)

**Persistent (Chronic)**
- Longer duration
- May not be associated with clinical findings or illness
- Pain disproportionate to etiology
- Often no objective sign
- Mood alterations are common
Nociceptive Pain

- Stimulation of nerve endings (nociceptors) responsible for initiation of the pain signal
- Signal transmits from the site of injury through the dorsal horn of the spinal cord and to the brain
- The brain is responsible for the pain experience
- Described as sharp, aching, throbbing

Receptors: Opioid, Serotonin, Norepinephrine, COX, NMDA, GABA, CB1/2
Neuropathic Pain

- Abnormal pain process through the central nervous system (CNS) due to:
  - Actual nerve damage
  - Structural changes causing pain nerves to fire easier and more often
- Dysfunctional pain
- Described as burning, tingling, stabbing, electric shock
- Often moves from one point to another
General Recommendations

• Establish procedure for pain assessment
• Use behavioral pain assessment tools as appropriate
  • Communicative: VAS, NRS*, VRS, Faces
  • Behavioral observation – BPS, FLACC, etc.
• Minimize physiologic indicators
• Reassess and document
  • Should be frequent - throughout shift, after interventions, and at transitions

Pain Assessment

- P
- Q
- R
- S
- T
- U
Numerical Pain Assessment Scale

Agonizing | Horrible | Dreadful | Uncomfortable | Annoying | None

10 9 8 7 6 5 4 3 2 1 0

Unbearable Distress

No Distress

Task

Date _____________ Start _______ End _______
Faces Pain Scale

Wong-Baker FACES Pain Rating Scale

0  NO HURT
1  HURTS LITTLE BIT
2  HURTS LITTLE MORE
3  HURTS EVEN MORE
4  HURTS WHOLE LOT
5  HURTS WORST

0-10 Numeric Pain Intensity Scale

0  No Pain
1  Mild Pain
2  Moderate Pain
3  Severe Pain
4  Worst Possible

www.uihealthcare.com/.../paincontrolchart.gif
Thermometer Pain Scale

![Pain Distress/Intensity Scale Image](cme.medscape.com)
Pain Assessment in Cognitive Impairment

- Elderly with mild/moderate cognitive issues are able to report pain reliably
- Reports from family/caregivers may be helpful
  - Caregivers may overestimate pain
  - Physicians and nurses have been found to underestimate and under treat pain
  - Caregiver report of intensity of pain should be cautiously evaluated

### Pain Assessment in Advanced Dementia - PAINAD

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breathing</strong></td>
<td>Normal</td>
<td>Occasional labored breathing. Short period of hyperventilation</td>
<td>Noisy labored breathing. Long period of hyperventilation. Cheyne-stokes respirations</td>
<td></td>
</tr>
<tr>
<td><strong>Independent of vocalization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Negative Vocalization</strong></td>
<td>None</td>
<td>Occasional moan or groan. Low level speech with a negative or disapproving quality</td>
<td>Repeated troubled calling out. Loud moaning or groaning. Crying</td>
<td></td>
</tr>
<tr>
<td><strong>Facial expression</strong></td>
<td>Smiling, or inexpressive</td>
<td>Sad. Frightened. Frown</td>
<td>Facial grimacing</td>
<td></td>
</tr>
<tr>
<td><strong>Body Language</strong></td>
<td>Relaxed</td>
<td>Tense. Distressed pacing. Fidgeting</td>
<td>Rigid. Fists clenched, Knees pulled up. Pulling or pushing away. Striking out</td>
<td></td>
</tr>
<tr>
<td><strong>Consolability</strong></td>
<td>No need to console</td>
<td>Distracted or reassured by voice or touch</td>
<td>Unable to console, distract or reassure</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL**

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This material prepared by the Geriatric Research Education Clinical Center, is provided by the Iowa Foundation for Medical Care, the Medicare Quality Improvement Organization for Iowa, was prepared by Mentor, under contract with the Centers for Medicare & Medicaid Services (CMS), an agency of the U.S. Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy.

Pain Management in Dementia

- Systematic review – International Journal of Geriatric Psychiatry
- Community-dwelling people with dementia
- 32 studies - 11 on assessment; 27 on treatment
- Pain more commonly reported by informal caregivers than self-report
- Limited evidence for pain focused behavioral observation assessment
- Medications – Community-dwelling with dementia versus those without dementia:
  - Acetaminophen more common
  - NSAIDs used less
  - More likely to receive strong opioids
- Conclude lack of high-quality studies on pain assessment and treatment
  - Consequences are very serious and require urgent attention
  - Recommend patient and caregiver centered, multi-dimensional, longitudinal approach

Dr. McLaughlin's Electric Belt
Cures Pain & Nervous Diseases

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Are arresting widespread attention. Throngs of sufferers besiege the offices to avail themselves of this offer. To those calling upon me I give a trial treatment free by my new Static Battery. These treatments are practical proof of the curative power of my Improved Belt, which is hailed as the greatest blessing in the medical world. It is the most modern form of applying the restorative current, is easy to use and thorough in its results. Written evidence of the astonishing cures I am thus making pours in every day.

One of the most striking cases is the following:

Nervous Derangement.

"I suffered severely from irregular action of the heart and poor circulation, which caused sleeplessness and shocks on the brain. I treated with three physicians, one of whom said he could not cure me. I feared I should go insane from my sufferings."

Such was the condition of a man who, January 6th, states that my Belt cured him, restored him to full health and gave him an appetite like a butch saw." His address is Mr. Noble Conger, Kirkland, Ariz.

Electricity is the grandest remedy of the age, for it restores life force and cures disease. My way of using this power, as each case needs, appeals to your intelligence and reason. The current blends with your magnetism, aids the bodily functions, gives you strength and casts out disease. It keeps up a persistent glow through the blood vessels, prevents shrinkage of the muscular coats of the arteries, feeds the cells and tissues with new force and by this nutrifying power builds up muscle.

You need no plaster, lotion or physic. My method absolutely cures your rheumatism, kidney, backache, nervous weakness or congestion. Try this remedy and you will lose your pain and recover strength. Call and take a trial treatment or send for Illustrated book free.

DR. M. A. McLAUGHLIN,
702 Market St., Corner Kearny, San Francisco, and
Bridle Beth, Corner Spring and Second Streets, Los Angeles.

Office hours—9 A.M. to 6 P.M., Sundays, 10 to 1. NEVER SOLD IN DRUG STORES.
## Nonpharmacologic Pain Management

<table>
<thead>
<tr>
<th>Physical Interventions</th>
<th>Complementary Approaches</th>
<th>Psychological Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat/Cold pads</td>
<td>Relaxation</td>
<td>Cognitive therapy</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>Imaging</td>
<td>Behavioral therapy</td>
</tr>
<tr>
<td>Massage</td>
<td>Distraction</td>
<td>Biofeedback</td>
</tr>
<tr>
<td>Exercise</td>
<td>Meditation</td>
<td>Hypnosis</td>
</tr>
<tr>
<td>Transcutaneous electrical nerve stimulation</td>
<td>Reiki</td>
<td>Mind-body interventions</td>
</tr>
</tbody>
</table>

Hartjes TM et al. AJN, 2016:116(10)
Interventional Treatments

- Epidural injections
- Nerve blocks
- Treatment of spinal cord compression
  - Kyphoplasty
  - Vertebroplasty
- Spinal cord stimulators
- Intrathecal injections
Pharmacokinetic Changes

• Absorption – PO/IM/Topical
• Distribution – Body composition and protein binding
• Metabolism – Active metabolites and reduced phase I reactions
• Elimination - Decreased renal blood flow, muscle mass, drug clearance

Decrease initial doses and extend out dosing intervals

Sera L, Uritsky, TJ. Progress in Palliative Care, 2016.
Pharmacodynamic Changes

- Assumed when kinetic changes do not explain alterations
- More variable & not as well understood
- Changes are seen in:
  - numbers or sensitivity of receptors
  - counter regulatory mechanisms
- Examples:
  - ↑ risk of tardive dyskinesia & parkinsonism with antipsychotics
  - ↑ sensitivity to anticholinergic effects
  - ↑ sensitivity to warfarin and NSAIDs

Sera L, Uritsky, TJ. Progress in Palliative Care, 2016.
Analgesic Use in Older Adults

• Must balance benefit vs. burden of treatments
• Use least invasive route of administration
• Dosing recommendations
  • Start at 30%-50% lower initial doses of most pain medications
  • Reassess frequently for dose adjustments
  • Goal: balance pain relief and better quality of life from treatment related side effects
• Options: opioids, nonopioids – acetaminophen/NSAIDs, co-analgesics
Interactive Audience Question

Which of the following agents is considered a Beers List medication and should be **avoided** in the older adult?

A. Duloxetine
B. Ibuprofen
C. Oxycodone
D. Gabapentin
Beers List

- **Analgesics**
  - Non-selective NSAIDs
    - Ibuprofen, etc.
  - Opioids
    - Meperidine, pentazocine
  - Muscle relaxants
    - Cyclobenzaprine, carisoprodol, etc.

- **Cardiovascular**
  - Clonidine

- **Psychotropics**
  - Tertiary tricyclic antidepressants (TCAs)
  - SNRIs
  - Benzodiazepines
  - Sedative/Hypnotics
    - Zolpidem, zaleplon, etc.
Opioids

- Suggested by the American Geriatric Society (AGS 2009) for use in older adults – as addition to acetaminophen
- Older adults generally require lower doses of opioids
- When selecting an agent, it is best to understand pharmacokinetics, equi-analgesic dosing, and adverse effects
- Consider adjuvant medications (co-analgesics)
- Frequently reassess treatment goals
Opioid Selection

- Morphine
- Hydromorphone
- Oxycodone
- Oxymorphone
- Fentanyl
- Methadone

- Buprenorphine
- Hydrocodone
- Codeine
- Tramadol
- Tapentadol
Opioid Dosing Considerations

• Individualize dose based on patient response
  • Adequate analgesia
  • Intolerable/unmanageable side effects
  • Over-dosage

• When switching opioids, consider incomplete cross-tolerance (30-50% reduction in dose)
## Basic Opioid Equivalency Chart

<table>
<thead>
<tr>
<th>OPIATE</th>
<th>ORAL</th>
<th>PARENTERAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine</td>
<td>30 mg</td>
<td>10 mg</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>20 mg</td>
<td>-</td>
</tr>
<tr>
<td>Hydrocodone</td>
<td>30 mg</td>
<td>-</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>7.5 mg</td>
<td>1.5 mg</td>
</tr>
<tr>
<td>Codeine</td>
<td>200 mg</td>
<td>130 mg</td>
</tr>
</tbody>
</table>
Opioids – Adverse Effects

- Constipation
- Nausea
- Urinary retention
- Pruritus
- Respiratory depression
- Cardiovascular
- CNS effects
Opioids- Special Populations

• Cancer Pain
  • “Around the clock” dosing for persistent, chronic, or frequently recurring pain
  • As needed “prn” dosing for “rescue” dosing and determining opioid dose requirement
    • Usually 10-20 % of the TOTAL DAILY DOSE of opioid per dose at usual dosing interval
  • Important to distinguish between
    – Incident pain
    – End-of-dose failure
Case: Cancer Pain

AT is an 82 year old man with pancreatic cancer, receiving 10 mg oxycodone/650 mg acetaminophen tablets. He takes 2 tablets every 4 hours around the clock. He reports an allergy to morphine.

When he takes 12 tablets per day his pain is well controlled.
Case: Cancer Pain

What do you want to do to provide safe and effective analgesia for Mr. T?

A. Discontinue oxycodone/acetaminophen and start oxycodone 10 mg PO q4h PRN
B. Discontinue oxycodone/acetaminophen and start Oxycodone ER 20 mg PO q12h PRN
C. Continue oxycodone/acetaminophen and start Oxycodone ER 60 mg PO q12h
D. Discontinue oxycodone/acetaminophen and start Oxycodone ER 60 mg PO q12h
Opioids- Special Populations

• Chronic pain
  • Opioids should be last resort
  • Maximize non-opioid and non-pharmacologic interventions
  • Many states and insurances following the CDC Guidelines
    • Maximum daily morphine equivalents (MEDD) of 90 mg
    • Check PDMP
    • Trial non-opioids first
    • Avoid starting long-acting opioid medications
    • Screening and close monitoring for high-risk patients
Case: Chronic Pain

• Mr. BB is a 75 yo male with a history of CAD, HTN, and BPH

• CC: Severe joint pain upon awakening. It takes about 3 hours to get moving to about 50% of his normal pace. His knees seem to be his biggest problem, followed closely by his hips. They are achy and sore and seem only to improve after heat and lots of massage.

• He has only tried the occasional dose of acetaminophen when he really needs to get moving – and it does not seem to help very much. He is worried he will be unable to care for his sick wife if it continues on in this way.
Interactive Audience Question

What do you recommend for Mr. BB?
A. Tramadol 50 mg PO q6h
B. Acetaminophen 1000 mg PO q8h
C. Ibuprofen 600 mg PO q6h
D. Oxycodone 5 mg PO q4h
Acetaminophen

- Drug of choice for mild/mod pain in the elderly
- Initial recommended treatment for osteoarthritis
- Used in combination with opioids for moderate to severe pain
- No effect on inflammation
- Good safety profile
  - Liver toxicity can occur with prolonged high dose use
  - Maximum dose: 4 g/day from all sources (3 g/day in older adult)
  - Caution with combination products
- Recent therapeutic reviews
Non-Steroidal Anti-Inflammatory Drugs (NSAIDS)

- Mild to moderate pain treatment
- Short term use for inflammatory pain
  - Gout, rheumatoid arthritis flare ups, headache
- Potential to affect blood pressure control, kidney function, and heart failure management
- Low dose opioid use may be a safer alternative
- Consider topical formulations to minimize systemic risks
- A course of steroids (dexamethasone) may be preferred for boney pain in cancer patients or for severe joint pain (RA)
Co-analgesic Agents

• Co-analgesic characteristics
  – Often used off label for pain
  – Agents consist of anti-depressants, anticonvulsants, topicals
  – Often used in combination with one or more usual pain medications
  – Individualized approach needed
Co-analgesic Agents

• Anti-epileptics
  • Gabapentin
  • Pregabalin
• Antidepressants
  • SSRIs: citalopram, sertraline, etc
  • SNRIs: duloxetine, venlafaxine
  • TCAs: nortriptyline
  • Mirtazapine
  • Others
Cannabis

• Appears to have utility in treatment of pain and chemotherapy-induced nausea/vomiting
• Local laws vary – investigate before use
• Perform thorough history and physical – including psychiatric history, history of substance abuse
• Has neuropsychiatric effects, but does not appear to increase the risk of lung cancer
• Positive and adverse effects may be different in older adults due to lack of studies in this population
• Metabolized by CYP2C9 and CYP3A4

Cannabis and Pain

- No subgroup analyses for pain in older adults
- Growing evidence of benefit in neuropathic pain
- Some evidence in relief of cancer-related pain
- Demonstrated efficacy in MS-related spasticity
- Possibly opioid-sparing in pre-clinical data
- Caution with other CNS depressants

How’s a girl (or guy!) to choose?

• For mild to moderate pain
  • NSAIDS, acetaminophen, low dose opioids
  • As needed for acute pain

• For severe pain
  • Opioids often mainstay in elderly
  • Determine pattern of pain (around the clock vs. as needed) when determining treatment

• Co-analgesics often used for nerve related pain or multi-modal analgesia in place of/addition to opioids

• Use combinations of medications with different mechanisms of actions
Case: Broken Hip

PT is an 88 year old female admitted with a fractured hip, now 1 day post surgery. She is reporting 8/10 pain. Hydromorphone 1mg IV q3h prn is ordered for pain.

Is this appropriate? Why or why not?

What should be considered in this case?
Interactive Audience Question

What type of pain is PT having?

A. Acute on chronic nociceptive pain
B. Acute neuropathic pain
C. Acute nociceptive pain
D. Mixed nociceptive/neuropathic pain
Post-operative Pain

• ACS NSQIP, and AGS joined forces to provide guidance on the pre-/peri-/post-operative management of older adults undergoing surgery
  • Anesthesiologists should provide ongoing education and training
  • Every older adult should receive a pain history and physical examination
  • Multimodal analgesic regimen prior to the operation
    • Appropriate titration
    • Prophylactic bowel regimen
    • Avoid Potentially Inappropriate Medications (PIMs)
    • Use opioid-sparing techniques
  • Prevent postoperative nausea/vomiting – preferred agent is 5HT3-RA
  • Prevent and screen for delirium daily

Multimodal Analgesia

Strategies for Managing Pain and Associated Disability

- Pharmacotherapy
  - APAP, NSAIDS, SNRI’s, TCAs, opioids, topical agents
- Interventional Approaches
  - Injections, neurostimulation
- Physical Medicine and Rehabilitation
  - Assistive devices, electrotherapy
- Complementary & Alternative Medicine
  - Massage, Supplements
- Psychosocial Support
  - Psychotherapy, group support
- Lifestyle Changes
  - Exercise, weight loss

https://paininjuryrelief.com/chronic-pain-a-multidimensional-disease
Interactive Audience Question

You recommend to discontinue the IV hydromorphone for your patient, PT. What else would you recommend for her pain?

A. Avoid further opioids to decrease risk of delirium
B. Acetaminophen 650 mg PO q4h PRN
C. Gabapentin 300 mg PO q8h
D. Oxycodone 5 mg PO q4h for severe pain
Key Take-Aways

• Pain is highly prevalent in older adults
• Changes in body composition and function lead to increased sensitivity in older adults
• Assess pain etiology and tailor treatments as best practice
• Avoid PIMs to minimize risk of harm in the older adult
• Multimodal analgesia should be the focus with lower initial doses and cautious initiation of each agent to assess benefits and effects