Chronic Pain Management in the Age of the Opioid Epidemic

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Disclosure

• Nothing to disclose
Who I am...

- Dual board certified Interventional Chronic Pain Specialist
- Pain Medicine Fellowship under Dr. Salim Hayek
  - University Hospitals Case Medical Center in Cleveland, OH
- Anesthesiology residency
  - University of Kentucky Medical Center in Lexington, KY
  - Behavioral research with rodents identifying physiologic causes for chronic pain signaling pathways and effect of endogenous and exogenous opioids

Objectives

- Outline the impact of the opioid epidemic in the Pennsylvania and the US
- Review literature and findings from current research studies regarding use of long-term opioid narcotics
- Review literature on the use of non-opioid medication management
- Outline current options in interventional procedures to target most common conditions
- Outline options in the treatment of chronic opioid narcotic use and options for weaning
Chronic Pain

- > 3 months duration
- Can be nociceptive, neuropathic, or mixed in etiology
  - Nociceptive - tissue injury
    - E.g. Acute incisional pain, Acute Pancreatitis
    - ‘sharp, throbbing’
    - Improves with time (e.g. POD 1 vs. POD 7)
  - Neuropathic - nerve pain
    - E.g. Inflammation or injury to nerves
    - ‘burning, stabbing, shooting, electrical’

Opioid Epidemic...
How it happened

- Prescribed with good intent by physicians with the objective to relieve suffering and improve daily function
- Bolstered by manufacturing pharmaceutical companies beginning in the 1990’s
- ‘if the patient is in pain...I must not have prescribed enough pain medications’
Public Health Epidemic

- 249, 000, 000 prescriptions for opioids were written in 2013 - enough for every adult in America to have a bottle of pills
- 300% increase in opioid prescription sales since 1999 WITHOUT overall change in reported pain

Source: Pennsylvania Department of Health

Downfalls of Chronic Opioid Use

- Tolerance
- Dependence
- Addiction
- Opioid Induced Hyperalgesia
- Long-term benefits not well supported in the treatment of chronic non-malignant pain (multiple studies)
Other Effects of Chronic Opioids

- **Sleep Disturbances**
  - Significant reduction in deep sleep & increased disruptive sleep; decreased efficiency and total sleep time

- **GI/GU effects**
  - nausea/vomiting, constipation, urinary retention

- **Endocrine:** decreased sex hormones and cortisol
  - Decreased energy, decreased libido, erectile dysfunction, reduced bone mineral density, amenorrhea

- **Immunologic:** cellular immune suppression
  - Down regulation and activity of NK cells, cytokines, and phagocytosis


Opioid Tolerance

- A physiological/pharmacologic process where a patient requires higher doses for an effect

- Adverse effects such as: pruritis, nausea, sedation and respiratory depression can be unpredictable and not subject to patient tolerance

- Patients with obesity and respiratory comorbidities (COPD, OSA) at high risk
  - Studies show relationship of opioid use with development of unpredictable patterns of respiration
    - Central sleep apnea
    - Ataxic breathing

Opioid Dependence

- Physiological process whereby cessation of opioid leads to withdrawal symptoms

- Opioid withdrawal
  - Early (6-12 hours): muscle ache, agitation, sleep disturbance, anxiety, lacrimation, rhinorhea, sweats, tachycardia, hypertension, fever
  - Late (peak at 72 hours and last a week or so): nausea/vomiting, diarrhea, goosebumps, stomach cramping, depression, drug cravings
- NOT life threatening

Source: http://americanaddictioncenters.org/withdrawal-timelines-treatments/opiate/

Opioid Addiction & Diversion

- A chronic relapsing illness characterized by compulsive drug seeking and use despite harmful consequences

- Patients are often polysubstance abusers

- Role of prescription drug monitoring programs and urine drug testing, pill counts
Patient Risk Factors for Abuse

- Age < 50 years
- Polysubstance abuse
- Psychiatric Conditions
  - PTSD, Bipolar disorder are at exceptional risk
- Concomitant use of benzodiazepines and sleep aids
  - risk of unpredictable respiratory depression and death
  - should not be prescribed together with opioids

Public Health Epidemic

- 80% of heroin addicts began with abusing prescription medications

Source: Pennsylvania Department of Health
Public Health Epidemic

• Heroin and opioid overdose has become the leading cause of accidental death in Pennsylvania

Source: Pennsylvania Department of Health

Public Health Epidemic: Pennsylvania

• Opioid abuse affects 1 in 4 families in PA
• Overdose deaths are on the rise (up 470%)
• Nationally, PA is ranked 7th for opioid related deaths
  • An estimated 7 Pennsylvanians die every day from opioid overdose

Source: Pennsylvania Department of Health
Opioid Induced Hyperalgesia

- State of nociceptive sensitization by exposure to opioids
- Paradoxical response where patients become more sensitive to painful stimuli which may be the same or different from the original pain
- Neuroplasticity in pain signaling pathways
  - Central glutaminergic system adaptation
  - Spinal dynorphins
  - Descending facilitation
  - Genetic mechanisms
- Decreased reuptake and enhanced nociceptive response


Opioid Induced Hyperalgesia

- Over the past decades many observational, cross-sectional, and prospective controlled studies on both animals and humans
- Human Subjects: former opioid addicts on methadone maintenance, perioperative exposure to opioids during surgery, healthy human volunteers
- Sensitization can occur with a single administration
- Intraoperative administration shown to increase post-operative requirement as well as requirement from subsequent surgeries
- Effect can last several months from single dose


Opioid Induced Hyperalgesia

- Has been shown to occur even with very low dose narcotic
- Patients on long-term use and high doses have increased risk
- Opioid infusion studies on normal volunteers leads to hypersensitivity
- Cannot be overcome by increasing doses of opioids
- Detoxification from high dose opioids leads to improvement in patients pain symptoms


Treatment of OIH

- Weaning: reduce or eliminate
- Manipulation of the glutaminergic system via NMDA receptor
  - Ketamine infusions
    - Can be beneficial in patients requiring high doses of opioid medications to aid in weaning process
    - Can be performed intraoperatively or on outpatient basis
  - Methadone
    - To reduce dose escalation in opioid appropriate patients
  - Other possibilities: Propofol, COX-2 inhibition, alpha2 agonists

Opioid Weaning

- Performed using 10-25% decrease over weekly or bi-weekly decrements
- Clonidine patch to treat withdrawal effects
- Patient Counseling
  - Educate on withdrawal symptoms and pain
  - Educate on expectations (‘no longer the standard of care’)
- Patients with significant comorbid psychiatric conditions should be evaluated by substance abuse/mental health specialist
  - Gaudenzia, Gage House, Esper Treatment Center, Safe Harbor, Mill Creek Community Hospital, Stairways Behavioral Health, Catholic Charities

PA PMP AWARxE

- [http://pennsylvania.pmpaware.net](http://pennsylvania.pmpaware.net)
- Went live August 2016 (37 states have databases)
  - Neighboring states also: New York, Ohio, West Virginia
  - Identify signs of addiction, doctor shopping, drug diversion
PA PMP AWARxE

- 2014 Act 191 **REQUIRES** all prescribers of controlled medications to query the database prior to prescribing narcotics the first time
  - Failure to do so is met by disciplining sanctions by the licensing board and/or could be viewed as criminal act

- Red flags: multiple prescribers, multiple pharmacies, concomitant use of opioids with benzodiazepines

- Patient records involving all scheduled prescriptions filled within 72 hours

- Patients can request a copy through the PA PDMP website quarterly

PA 2014 Act 191 Amendment

- **November 2016:** Governor Tom Wolf signs legislation to target Pennsylvania’s Heroin and Opioid epidemic

- Prescribers are required by law to check PDMP **every** time a controlled substance is prescribed

- PDMP will show medications dispensed in **last 24hrs**
PA 2014 Act 191 Amendment

- Limit opioid prescriptions to emergency room and urgent care patients and minors
- Cannot prescribe in quantities >7 days
- Cannot refill prescriptions that have been lost, stolen or destroyed
- Require insurance companies to cover abuse deterrent opioids
- Establish a voluntary directive non-opioid form for patients who refuse administration or prescribing of medication

‘Turn the Tide’ on Opioid Abuse

- A campaign initiated by the US Surgeon General - Dr. Vivek H. Murthy

- Pledge:
  - Educate ourselves to treat pain safely and effectively.
  - Screen our patients for opioid use disorder and provide or connect them with evidence-based treatment.
  - Talk about and treat addiction as a chronic illness, not a moral failing.
CDC Guidelines for Tx of Chronic Non-Cancer Pain

- Benefits of long-term opioid therapy for chronic pain **not** well supported by evidence
- Should **not** be a first line consideration

- Short-term benefits for **small to moderate** pain; inconsistent for improvement of function
- Should the patient require opioid medication during hospital stay for acute symptoms:
  - Query PDMP prior to ordering medication
  - Patients should be discharged with weaning scheduling
  - Assess, tailor, & **TAPER**

- Insufficient evidence for long-term benefits in low back pain, headache, fibromyalgia

Source: Centers for Disease Control
CDC Guidelines for Tx of Chronic Non-Cancer Pain

- If greater than 50 MEQ (50mg hydrocodone, 33mg oxycodone) increase frequency of follow-up and consider offering Naloxone
- Avoid greater than 90 MEQ/day (90 mg hydrocodone, 60mg oxycodone), consider specialist referral instead

Source: Centers for Disease Control

Treatments for Chronic Pain

- Establishing realistic expectations
  - Treatments do not eradicate symptoms, but are targeted to improve quality of life
  - Patients with history of high dose narcotic use and/or illicit drug use will be unlikely to be satisfied with pain control in the inpatient setting
    - Ordering increasing doses of opioids will not provide better symptom relief
    - Consider adjuvant therapies instead (nerve block, non-opioid medications)

- Physical Treatments
  - PT/OT, weight loss/bariatric surgery, smoking cessation

- Non-opioid medication management

- Interventional procedures
Non-Opioid Medication Management

- Membrane stabilizers (need to be titrated)
  - Topiramate 100mg BID
  - Gabapentin 600mg TID
  - Lyrica 225mg BID

- Anti-depressants
  - Duloxetine 60mg qHS
  - Amitryptiline 10mg qHS
  - Maprotiline 75mg qHS

- Anti-inflammatories
  - Scheduled Ketoralac
    - 30mg IV delivers the equivalent of 6-12mg IV Morphine
  - Scheduled Acetaminophen

- Anti-inflammatories
  - Lidoderm patches

- Compounding creams
  - PRN Tramadol 50mg 1-2 tablets q8hrs

Interventional Procedures

- Performed after a complete evaluation in the clinic
- Imaging currently not required for evaluation
- Great Lakes Pain Medicine is located in the Hamot Professional Building alongside Great Lakes Neurosurgery
- Benefit is to facilitate ongoing physical therapy

- Procedures in Hamot Surgery Center
  - Most performed in a few minutes under live image guidance; usually within 1-2 weeks from clinic evaluation
  - Light IV sedation is an option (patients are fully awake)
  - Anti-coagulants must be held per ASRA guidelines
  - No activity restrictions following injections
## Interventional Procedures

<table>
<thead>
<tr>
<th>Problem</th>
<th>Options Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal Radiculitis/Stenosis</td>
<td>Epidural Steroids, Spinal cord stimulation</td>
</tr>
<tr>
<td>Spinal Spondylosis</td>
<td>Medial branch block/RFA</td>
</tr>
<tr>
<td>Sacroilitis</td>
<td>SI steroid injection</td>
</tr>
<tr>
<td>Knee Pain</td>
<td>Steroid or Synvisc (office), Genicular denervation/RFA</td>
</tr>
<tr>
<td>Hip Pain</td>
<td>Steroid, Sensory denervation/RFA</td>
</tr>
<tr>
<td>CRPS</td>
<td>Sympathetic blocks, Spinal cord stimulation</td>
</tr>
<tr>
<td>Peripheral Neuropathy</td>
<td>Spinal cord stimulation</td>
</tr>
<tr>
<td>Myofascial Pain</td>
<td>Trigger point injections (office)</td>
</tr>
<tr>
<td>Migraine</td>
<td>Botox injections (office)</td>
</tr>
</tbody>
</table>

## ASRA 2015 Guidelines for Patients on Anticoagulation

<table>
<thead>
<tr>
<th>Medication</th>
<th>Minimum Hold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin</td>
<td>7 days for cervical injection</td>
</tr>
<tr>
<td>Brillinta</td>
<td>5 days</td>
</tr>
<tr>
<td>Coumadin</td>
<td>5 days (and normal INR)</td>
</tr>
<tr>
<td>Eliquis</td>
<td>5 days</td>
</tr>
<tr>
<td>Plavix</td>
<td>7 days</td>
</tr>
<tr>
<td>Pradaxa</td>
<td>5 days</td>
</tr>
<tr>
<td>Xarelto</td>
<td>5 days</td>
</tr>
</tbody>
</table>
Radiofrequency Ablation

- Injection technique to deactivate select types of nerves
- Effect should last 6-9 months after which nerves ‘regrow’ and the procedure will need to be repeated
- Spinal arthritis pain, knee & hip pain, some types of abdominal pain

Cryoablation is used for all other nerve denervation secondary to risk of development of ‘anesthesia dolorosa’ (deafferentation pain)

Spinal Cord Stimulation

- Surgically implanted device that disrupts pain signaling pathways via low level electrical stimulation from wires in the epidural space
- Treats pain that neuropathic in etiology
  - post-laminectomy, CRPS, peripheral neuropathy, peripheral vascular disease, refractory angina
- Trial before implant (similar to epidural injection)
- Wirelessly rechargeable battery will last 5-12 years
- Non-rechargeable battery will last 2.5-4.5 years
- Patients have a ‘remote’ to turn on and off as well as to change programming modes
**Intrathecal Drug Delivery**

- Surgically implanted device with catheter that delivers microdosed medication to the cerebral spinal fluid to act directly on the substantia gelatinosa
- Low dose narcotic opioid with local anesthetic
- Post-laminectomy patients with axial pain
- Cancer patients unable to tolerate narcotic pain medications (side effects vs. efficacy)
- Usually have basal rate with patient activated bolusing
- Pump life 5-7 years and requires medication refills


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**Ketamine Infusions**

- Level II evidence to treat central pain, fibromyalgia, nonspecific neuropathic pain, phantom limb pain, post-herpetic neuralgia
- Can be used to wean high dose narcotic dependent patients
- Targets NMDA receptors to treat pain and to ‘reset’ pain receptors
- Outpatient infusion over 6-8 hours
  - Many different protocols for delivery (single daily 500mg)
  - Also can be performed intraoperatively on patients who have a history of chronic pain

Behavioral Modification

- Clinical Pain Psychologist
- Patients often develop ‘learned helplessness’
- Avoidance behaviors
- Catastrophization
- Dependence on others and often may be enabled by other family members
- Malingering

- Coping skills
- Cognitive Behavioral Therapy
- Family Therapy

Chronic Pain Rehab

- Chronic Pain Rehabilitation Centers “Pain Boot Camp”
  - A daily three week long multidisciplinary rigorous program to treat pain management non-responders
  - Utilize multi-modal method alongside other patients
    - Opioid weaning
    - Medication management
    - Target psychosocial stressors and maladaptive behavior
      - Involves patient’s support network
    - Physical therapy/Aquatherapy
    - Biofeedback
    - Group therapy
- UPMC Shadyside (Pain Evaluation and Treatment Institute)
- Cleveland Clinic Chronic Pain Rehabilitation Program
Questions ?