Modern Pain Management: Acute and Chronic

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Disclosures

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- No other financial disclosures
OBJECTIVES

- Perils of opioid use
- Opioids for post surgical pain
- Strategies to minimize post-op opioids
  - Multimodal analgesia
  - Regional analgesia
- Opioid weaning
POOR POST-OP ANALGESIA

- Tachycardia, Hypertension
- Venous stasis, hypercoagulability
- Decrease alveolar ventilation
- Immunosuppression
- Hyperglycemia, impaired wound healing
- Hospital length of stay ($$
- Risk of chronic pain

Amputation 50–85%  
Thoracotomy 5–65%  
Cardiac surgery 30–55%  
Mastectomy 20–50%  
Cholecystectomy 5–50%  
Hernia repair 5–35%  
Hip replacement 12%  
Caesarean section 6%  

**CHRONIC PAIN**

- Defined by the IASP as:
  
Pain that persist beyond normal tissue healing time, which is assumed to be 3 months.”
<table>
<thead>
<tr>
<th>Condition</th>
<th>Prevalence</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Pain</td>
<td>116 million</td>
<td>Institute of Medicine of The National Academies</td>
</tr>
<tr>
<td>Diabetes</td>
<td>25.8 million Americans (diagnosed and estimated undiagnosed)</td>
<td>American Diabetes Association</td>
</tr>
<tr>
<td>Coronary Disease</td>
<td>16.3 million Americans</td>
<td>American Heart Association</td>
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<tr>
<td>Stroke</td>
<td>7.0 million Americans</td>
<td>American Heart Association</td>
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<tr>
<td>Cancer</td>
<td>11.9 million Americans</td>
<td>American Cancer Society</td>
</tr>
</tbody>
</table>
COST

OPIOIDS
Opioid cause negative side effects for almost every body part!
<table>
<thead>
<tr>
<th>Common Adverse Events</th>
<th>Tolerance</th>
<th>Dependence</th>
<th>Hyperalgesia</th>
<th>Hypogonadism</th>
<th>Addiction (use despite harm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constipation</td>
<td>Leads to loss of treatment effectiveness requiring an increase in dose</td>
<td>Can be both mental and physical</td>
<td>Diffuse heightened pain sensitivity despite increasing dosage of opioids or disease stability</td>
<td>Decreased testosterone-leading to fatigue</td>
<td>Leads to risk of aberrant behavior</td>
</tr>
<tr>
<td>Nausea</td>
<td>Increased dose in turn leads to a greater risk for adverse events</td>
<td>Lead to risk of withdrawal</td>
<td></td>
<td>Osteopenia-leading to risk of fractures</td>
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<tr>
<td>Vomiting</td>
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<td>Respiratory depression</td>
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<tr>
<td>Sedation</td>
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<tr>
<td>Urinary retention</td>
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<tr>
<td>Pruritus</td>
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<table>
<thead>
<tr>
<th>Category</th>
<th>OUD Diagnosis: Mild 2-3, Moderate- 4-5, Severe- 6+</th>
</tr>
</thead>
</table>
| Impaired control      | - Opioids used in larger amounts or for longer than intended  
|                       | - Unsuccessful efforts or desire to cut back or control opioid use  
|                       | - Excessive amount of time spent obtaining, using, or recovering from opioids  
|                       | - Craving to use opioids  |
| Social impairment     | - Failure to fulfill major role obligations at work, school, or home as a result of recurrent opioid use  
|                       | - Persistent or recurrent social or interpersonal problems that are exacerbated by opioids or continued use of opioids despite these problems  
|                       | - Reduced or given up important social, occupational, or recreational activities because of opioid use  |
| Risky use             | - Opioid use in physically hazardous situations  
|                       | - Continued opioid use despite knowledge of persistent physical or psychological problem that is likely caused by opioid use  |
| Pharmacological properties | - Tolerance as demonstrated by increased amounts of opioids needed to achieve desired effect; diminished effect with continued use of the same amount  
|                       | - Withdrawal as demonstrated by symptoms of opioid withdrawal syndrome; opioids taken to relieve or avoid withdrawal  |

Not counted if taking prescribed opioids only.
In 2007, **hydrocodone was the most popular** prescription drug

>135 million prescriptions written, much more than cholesterol lowering agents (statins), blood pressure medications or antibiotics

High level of acetaminophen causes liver damage
OPIOIDS- USAGE, RISING ADDICTION

- 2014- DEA rescheduled hydrocodone combination products to Schedule II from Schedule III

- Rescheduling alerts the prescribers about addiction and misuse potential

THE OPIOID EPIDEMIC BY THE NUMBERS

130+ People died every day from opioid-related drug overdoses

47,600 People died from overdosing on opioids

11.4 m People misused prescription opioids

2.1 million People had an opioid use disorder

81,000 People used heroin for the first time

2 million People misused prescription opioids for the first time

28,466 Deaths attributed to overdosing on synthetic opioids other than methadone

886,000 People used heroin

15,482 Deaths attributed to overdosing on heroin

SOURCES
2. NCHS Data Brief No. 293, December 2017
In 2016, 11.5 million people self-reported personally misusing prescription opioids. Most commonly-reported reason for misuse was to relieve pain (62.3%).

https://www.cdc.gov/drugoverdose/data/overdose.html
Key Substance Use and Mental Health Indicators in the United States: Results from the 2016 National Survey on Drug Use and Health.
Increases in Rx Opioid Prescribing Coincide with Increases in Rx Opioid Overdose Deaths

Opioids now account for more overdose deaths than heroin and cocaine combined.

50-85% of heroin users start by abusing prescription opioids.

3 Waves of the Rise in Opioid Overdose Deaths

- Wave 1: Rise in Prescription Opioid Overdose Deaths
- Wave 2: Rise in Heroin Overdose Deaths
- Wave 3: Rise in Synthetic Opioid Overdose Deaths

Most of this loss (96%) was unintentional; 0.21 years were lost to opioid related deaths.
12 Leading causes of death (ranked highest to lowest according to No. of deaths in year 2015)

Diseases of the heart
Malignant neoplasms
Chronic lower respiratory diseases
Unintentional injuries
Cerebrovascular diseases
Alzheimer disease
Diabetes mellitus
Influenza and pneumonia
Nephritis, nephrotic syndrome, and nephrosis
Suicide
Septicemia
Chronic liver disease and cirrhosis

Drug, opioid, and alcohol poisoning deaths

- Drug poisoning
- Opioid-involved poisoning
- Alcohol poisoning

Dowell D, JAMA. 2017
Distributed MEQ (morphine in mg/patient in need of palliative care, average 2010-2013), and % of need that is met.

http://www.worldmapper.org/
Knaul et al. The Lancet. 2017
International Narcotics Control Board and WHO Global Health Estimates, 2015
Americans consume more opioids than any other country.

Source: United Nations International Narcotics Control Board
Credit: Sarah Frostenson
Some states have more painkiller prescriptions per person than others.

Number of painkiller prescriptions per 100 people:
- 52-71
- 72-82.1
- 82.2-95
- 96-143

SOURCE: IMS, National Prescription Audit (NPA™), 2012.
So Who’s Prescribing?..........Everyone!

Top 25 Prescriber Specialties by Total Medicare Part D Claims for Schedule II Opioids in 2013

Values are reported on logarithmic scale.

Chen et al. JAMA Intern Med 2016
Trends in Opioid Rx over Total Rx

* Percent change depicts the cumulative, absolute change away from 2007 rate for opioid prescriptions as a fraction of total prescriptions.
Trends in Annual Opioid Prescribing Rates by Overall and High-Dosage Prescriptions

Source: IQVIA® Transactional Data Warehouse

https://www.cdc.gov/drugoverdose/data/prescribing.html
EXCESSIVE AND WIDE VARIATIONS OF POST-OP OPIOID PRESCRIPTIONS

FIGURE 1. Frequency of opioid pills prescribed (A, C) and taken (B, D) after partial mastectomy and partial mastectomy with sentinel lymph node biopsy.

Prescribed

Taken

Unused Pills- Where Did They Go

- 5% returned them to a DEA approved collection site
- 4% flushed them down the toilet
- 3% mixed it with coffee grounds or kitty litter and disposed them in trash
- 14% disposed directly in trash
- Rest (>70%) didn’t recall a disposal method or still had them in possession

ABUSERS’ SOURCES OF PRESCRIPTION PAINKILLERS

55% Obtained free from friend or relative
7.1% Other source
4.4% Obtained from drug dealer or stranger
4.8% Took from friend or relative without asking
11.4% Bought from friend or relative
17.3% Prescribed by 1 doctor

Centers for Disease Control and Prevention.
NEW PERSISTENT OPIOID USE AFTER MINOR AND MAJOR SURGICAL PROCEDURES IN US ADULTS

• Population-based study of 36 177 surgical patients
• Incidence of new persistent opioid use after surgical procedures was **5.9 to 6.5%**
• Did not differ between major and minor surgical procedures
ACUTE PAIN CDC RECOMMENDATION FOR OPIOIDS

- Use lowest effective dose
- Shortest expected duration of pain (<3 d for most, rarely>7d)

Responding to an Epidemic

115 Opioid Deaths Each Day
40% From Prescription Opioids
4x as many as in 1999 and still rising

28 States Have Limited Opioid Prescriptions

Statutory Limits
- 14 days
- 7 days
- 5 days
- 3-4 days
- Morphine Milligram Equivalents (MME)
- Direction or authorization to other entity to set limits or guidelines
- No limits

Source: Centers for Disease Control and Prevention, National Conference of State Legislatures
NEJM Catalyst (catalyst.nejm.org) © Massachusetts Medical Society
# Opioid Prescribing Recommendations for Opioid Naïve Patients (Updated 2019)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Oxycodone* 5mg tablets</th>
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<tr>
<td>Dental Extraction</td>
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<tr>
<td>Thyroidectomy</td>
<td>5</td>
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<tr>
<td>Laparoscopic Anti-reflux (Nissen)</td>
<td>10</td>
</tr>
<tr>
<td>Appendectomy – Lap or Open</td>
<td>10</td>
</tr>
<tr>
<td>Laparoscopic Donor Nephrectomy</td>
<td>10</td>
</tr>
<tr>
<td>Hernia Repair – Major or Minor</td>
<td>10</td>
</tr>
<tr>
<td>Sleeve Gastrectomy</td>
<td>10</td>
</tr>
<tr>
<td>Laparoscopic Cholecystectomy</td>
<td>10</td>
</tr>
<tr>
<td>Open Cholecystectomy</td>
<td>15</td>
</tr>
<tr>
<td>Colectomy – Lap or Open</td>
<td>15</td>
</tr>
<tr>
<td>Ileostomy/Colostomy Creation, Re-siting, or Closure</td>
<td>15</td>
</tr>
<tr>
<td>Open Small Bowel Resection or Enterolysis</td>
<td>20</td>
</tr>
<tr>
<td>Prostatectomy</td>
<td>10</td>
</tr>
</tbody>
</table>

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<tbody>
<tr>
<td>Carotid Endarterectomy</td>
<td>10</td>
</tr>
<tr>
<td>Cardiac Surgery via Median Sternotomy</td>
<td>15</td>
</tr>
<tr>
<td>Cesarean Section</td>
<td>15</td>
</tr>
<tr>
<td>Hysterectomy – Vaginal, Lap/Robotic, or Abdominal</td>
<td>15</td>
</tr>
<tr>
<td>Breast Biopsy or Lumpectomy</td>
<td>5</td>
</tr>
<tr>
<td>Lumpectomy + Sentinel Lymph Node Biopsy</td>
<td>5</td>
</tr>
<tr>
<td>Sentinel Lymph Node Biopsy Only</td>
<td>5</td>
</tr>
<tr>
<td>Wide Local Excision ± Sentinel Lymph Node Biopsy</td>
<td>20</td>
</tr>
<tr>
<td>Simple Mastectomy ± Sentinel Lymph Node Biopsy</td>
<td>20</td>
</tr>
<tr>
<td>Modified Radical Mastectomy or Axillary Lymph Node Dissection</td>
<td>30</td>
</tr>
<tr>
<td>Total Hip Arthroplasty</td>
<td>30</td>
</tr>
<tr>
<td>Total Knee Arthroplasty</td>
<td>50</td>
</tr>
</tbody>
</table>

Opioid Prescribing Engagement Network. [https://opioidprescribing.info/](https://opioidprescribing.info/)
CONCERNS?

- **Concern**: If we write for fewer opioids, there will be
  - an increase in phone calls for refills or
  - inadequate pain control.

- However, studies found that with appropriate patient education,
  - not only did patients consume less medication,
  - but requests for refills did not increase.

COUNSELLING PATIENTS

- **SET EXPECTATIONS**
  - “Some pain is normal. You should be able to walk and do light activity, but may be sore for a few days. This will gradually get better.”

- **SET NORMS**
  - “Half of patients who have this procedure take under 10-15 pills.”

- **NON-OPIOIDS**
  - “Take acetaminophen and ibuprofen around the clock, and use the stronger pain pills only as needed for breakthrough pain.”
  - Avoid NSAIDs in patients with peptic ulcer disease and associated risk factors (smoking, drinking), bleeding disorders, renal disease, and specific operations at surgeon discretion.

- **APPROPRIATE USE**
  - “These pills are for pain from your surgery, and should not be used to treat pain from other conditions.”

- **ADVERSE AFFECTS**
  - “We are careful about opioids because they have been shown to be addictive, cause you harm, and even cause overdose if used incorrectly or abused.”

- **SAFE DISPOSAL**
  - “Disposing of these pills prevents others, including children, from accidentally overdosing. You can take pills to an approved collector (including police stations), or mix pills with kitty litter in a bag and throw them in the trash.”

Michigan OPEN [https://opioidprescribing.info/](https://opioidprescribing.info/)
AAOS-PAIN RELIEF TOOL KIT

- Preoperative Pain Relief Discussion
  Help prepare patients for what to expect and make a plan for pain relief.

- Postoperative Pain Relief
  Pain is part of the healing process and knowing what to expect will help patients achieve peace of mind.

- Preoperative Screening Questionnaires
  Determine your patients’ risk for opioid dependence.

- Emergency Dept. Opioid Strategy
  Strategies for relief of musculoskeletal pain in the Emergency Department.

- Orthopaedic Dept./Service Strategies
  Having a prescribing policy in place, such as receiving prescriptions from one provider or limiting the number of pills prescribed, will reduce the number of pills that can potentially be diverted, abused, and/or misused.

- Safe Use, Storage, and Disposal
  Strategies for safely using, storing and disposing of opioids.

- Doctor-Patient Scripts
  Scripts for dealing with common pain relief situations.

https://aaos.org/PainReliefToolkit/?ssopc=1
POST-OP PAIN RELIEF

- Pain relief after surgery
  - Remember pain is part of the normal healing process after surgery
  - Pain will improve day by day. The first few days are the worst. Things will continue to heal and improve the entire next year.
  - To get the work done we have cut through healthy tissue. Your body needs time to heal.

- Getting comfortable
  - Try to take as little opioid pain medication as possible
  - If there is no acetaminophen in the opioid pills, add acetaminophen (Tylenol)- either take 2 extra strength every 6 hours or 2 regular strength every 4 hours for two days
  - Add ibuprofen 600-800mg every 6 hours for two days.
  - Stagger Tylenol and ibuprofen so that you are taking one or the other every 3 hours
  - Elevate surgical area, use ice (10 min on, 5 min off)

- If you had a nerve block
  - When your block is wearing off, you need to “catch up”. You can take the stronger pain reliever every 3 hours for the next 3 doses.

https://www.aaos.org/Quality/PainReliefToolkit/AfterSurgery/
Pre-operative Screening Tools

Pain Self-Efficacy Questionnaire (PSEQ-2)
- A measure of effective coping strategies
- Pain self efficacy questionnaire (PSEQ-2)

Patient Health Questionnaire (PHQ-2)
- A measure of symptoms of depression
- Patient health questionnaire (PHQ-2)

Risk of opioid abuse
- The Screener and Opioid Assessment for Patients in Pain (SOAPP)

Patient Health Questionnaire 2 (PHQ-2)
A measure of symptoms of depression
- Over the past 2 weeks, how often have you been bothered by any of the following problems?

1. Little interest or pleasure in doing things.
   - Not at all
   - Several days
   - More than half of the days
   - Nearly every day

2. Feeling down, depressed, or hopeless.
   - Not at all
   - Several days
   - More than half of the days
   - Nearly every day

*Total score 6-9. A "cut-off" score of 3 is suggested for considering additional screening and treatment for major depression, but the categories aren't as important as the fact that symptoms of depression will lead to greater pain. Working to decrease symptoms of depression prior to discretionary/elective surgery could be helpful.

The Screener and Opioid Assessment for Patients in Pain (SOAPP)*
- Brief paper and pencil tool to facilitate assessment and planning for chronic pain patients being considered for long-term opioid treatment.

Resources: SOAPP
1. General
   a. Intended for use by licensed health care professionals only
   b. Copyrighted by Inflixion, Inc.

Citations
2. https://ccde.drupabase.gov/instrument/fc/21670be8e-ac44-e044-ba90ad3387
**PHONE CALL SCRIPTS**

**Strategy:**
- empathize
- normalize the pain
- rule out problems
- strategize
- be available

- One at a time with pauses between. Listen more than speak.
- "Does the surgery hurt more than you expected?"
- "Pain can feel like something is wrong" (Rule out compartment syndrome)
- "Your body needs time to heal"
- "Are you using all of the pain management strategies?"

https://www.aaos.org/Quality/PainReliefToolkit/Scripts/
**RED FLAG WARNING SIGNS - PRESCRIBING AND DISPENSING CONTROLLED SUBSTANCES**

- **Screening tool** to be considered before prescribing an opioid

- Developed by coalition of multiple societies, pharmacists, pharmacy stores and DEA:
  - American Academy of Family Physicians
  - American Medical Association
  - American Osteopathic Association
  - American Pharmacists Association
  - American Society of Anesthesiologists
  - American Society of Health-System Pharmacists
  - Cardinal Health
  - CVS Health
  - Healthcare Distribution Management Association
  - National Association of Boards of Pharmacy
  - National Association of Chain Drug Stores
  - National Association of Boards of Pharmacy
  - National Community Pharmacists Association
  - Pharmaceutical Care Management Association
  - Purdue Pharma L.P.
  - Rite Aid Walgreen Co.
RED FLAG WARNING SIGNS

Initial visit/Presentation

- Patients who travel to the prescriber’s practice as a group and all request controlled substance on the same day
- Decline physical exam, or diagnostics, or permission to obtain records
- Conduct suggest abuse of controlled substances

Medication Taking/Supply

- Multiple unsanctioned dose escalations
- Route of drug administration used other than prescribed
- Seeking medications from non-coordinated sites of care - e.g., ED, urgent care
- Unintentional or intentional overdose

RED FLAG WARNING SIGNS

Patient behavior/communication
- Prescriptions from multiple practitioners without the prescribers’ knowledge of other prescriptions
- Discharged from another practice for egregious behavior
- Pressuring physician to prescribe by implying or making direct threats to the prescriber or staff

Treatment Plan Related
- Resists change in treatment plan despite clear evidence of adverse effects
- Refuse to sign or fail to comply with opioid agreement governing use of opioids

Illicit/Illegal
- Altering or forging prescriptions
- Diverting or selling medication, or “borrowing” drugs from others
- Requesting controlled substance prescriptions written in the other people names for whom patient is not the designated caregiver
TRAINED AS AGENTS OF CHANGE IN THE
opioid epidemic

- Method
  - Anonymous online survey
  - At an ACGME accredited general surgery program at a university-based tertiary hospital

- Surgical trainees are relying almost exclusively on opioids for postoperative analgesia, often in excessive amounts.

- They are
  - heavily influenced by their superiors
  - are not receiving formal opioid-prescribing education

- Great need for increased resident education on postoperative pain and opioid management to help change prescribing habits.

MULTIMODAL ANALGESIA

- Combination of analgesics that act by different mechanisms
  - Medications focusing on non-opioids
  - Local anesthetic infiltration
  - Regional anesthesia
  - Non-pharmacologic approaches
    - Physical therapy
    - Complementary therapy

Result:
- additive or synergistic analgesia
- lowered adverse event compared to sole agent
- decrease opioids
MULTIMODAL ANALGESIA

Management of Postoperative Pain

- Expert panel guideline from the
  - American Pain Society
  - American Society of Regional Anesthesia and Pain Medicine, &
  - American Society of Anesthesiologists

- Based on a systematic review of evidence on management of postoperative pain

- Support **use of multimodal regimens**: High quality evidence

- The **exact components** of effective multimodal care will **vary** depending on the patient, setting, and surgical procedure.

MULTIMODAL ANALGESIA REDUCES OPIOID USE

- Retrospective review, national population based data source
- >1.5 million patients
MULTIMODAL ANALGESIA REDUCES ADVERSE EVENTS

- Patients receiving more than 2 modes (compared to "opioids only") experienced
  - 19% fewer respiratory complications
  - 26% fewer gastrointestinal complications
  - 18.5% decrease in opioid prescription
  - 205 vs. 300 overall median oral morphine equivalents
  - 12.1% decrease in length of stay

REGIONAL ANESTHESIA- MECHANISM

- Temporarily blocks nerve impulses to a certain intended area of the body, thus reducing pain
- Inhibits neural conduction from the surgical site to the spinal cord
- Decreases spinal cord sensitization
- In some cases may be used as the sole anesthetic

Chen et al. Cochrane Database of Systematic Reviews 2014
REGIONAL ANESTHESIA-OPTIONS

- Duration:
  - Single shot or continuous

- Central to peripheral:
  - Neuraxial - spinal/epidural
  - Plane blocks and Peripheral nerve block
  - Local infiltration
EXAMPLES OF REGIONAL

- Gastrointestinal: epidural, spinal or paravertebral nerve blocks/catheters
- Gynecology: epidural, spinal or paravertebral nerve blocks and catheters
- Ophthalmology: injection of local anesthetics
- Orthopedics: epidural, spinal, or peripheral nerve blocks/catheters
- Thoracic surgery: epidural, paravertebral or intercostal nerve blocks/catheters
- Urology: epidural, spinal or paravertebral nerve blocks/catheters
- Vascular surgery: cervical blocks for carotid surgeries; epidural or paravertebral nerve block for abdominal aortic endovascular or lower extremity bypass procedures

https://www.asra.com/page/41/regional-anesthesia-for-surgery
- Retrobulbar and peribulbar block
- Superficial cervical plexus block
- Occipital nerve block
  - Supraorbital,
  - Infraorbital
  - Maxillary and
  - Mandibular divisions
- Glossopharyngeal nerve block
PERIPHERAL NERVE BLOCK - UPPER EXTREMITIES

- **Brachial plexus block**
  - Interscalene
  - Supraclavicular
  - Infraclavicular
  - Axillary

- **Individual nerve block**
  - Median,
  - Radial,
  - Ulnar,
  - Musculocutaneous
  - Suprascapular block
  - Axillary nerve block
PERIPHERAL NERVE BLOCK - CHEST AND THORAX

- Paravertebral block
- Erector spinae block
- Intercostal nerve block
- Pec I and II block
- Serratus anterior plane block
PERIPHERAL NERVE BLOCK-ABDOMEN, GROIN AND GENITALIA

- Transversus Abdominis Plane block
- Rectus sheath block
- Quadratus lumborum block
- Ilioinguinal nerve block
- Genitofemoral nerve block
- Pudendal nerve block
PERIPHERAL NERVE BLOCK- LOWER EXTREMITIES

- Lumbar plexus
- Fascia iliaca
- Lateral femorocutaneous nerve block
- Femoral/Adductor canal/saphenous nerve block
- Sciatic/popliteal/post tibial/peroneal/sural nerve block
- Obturator nerve block
- Ankle block, Digital block
<table>
<thead>
<tr>
<th>Thoracic Surgery</th>
<th>Upper Abdominal Surgery</th>
<th>Colorectal Surgery</th>
<th>Urologic Surgery</th>
<th>Gynecologic Surgery</th>
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<tbody>
<tr>
<td>Thoracotomy</td>
<td>Esophagectomy</td>
<td>Colectomy</td>
<td>Cystectomy</td>
<td>Ovarian tumor debulking</td>
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<td>Repair of pectus deformities</td>
<td>Gastrectomy</td>
<td>Bowel resection</td>
<td>Nephrectomy</td>
<td>Pelvic exenteration</td>
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<tr>
<td>Thoracic aortic aneurysm repair</td>
<td>Pancreatectomy</td>
<td>Abdominal perineal resection</td>
<td>Ureteral repair</td>
<td>Radical abdominal hysterectomy</td>
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<tr>
<td>Thymectomy</td>
<td>Hepatic resection</td>
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<td>Radical abdominal prostatectomy</td>
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<tr>
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<td>Abdominal aortic aneurysm repair</td>
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<tr>
<td></td>
<td>Cholecystectomy</td>
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</table>
NEURAXIAL-BENEFITS OF THORACIC EPIDURAL

- Better pain control
- Reduced opioid intake
- Optimizes respiratory function
- Avoids sedation
- Blunts surgical stress response
- Lower incidence of DVT
- Improved bowel recovery
- Decrease nausea

Carli et al. Dis Col Rectum 2001
Manion et al. Anesth 2011
>1 million patients who underwent hip and knee arthroplasty reviewed

Only 12.5% received peripheral nerve block

Several benefits noted for those received peripheral nerve block:
  - Reduce opioid consumption
  - Reduced odds of wound complications
  - Reduced odds of pulmonary complications
  - Decrease length of stay
  - Lower rates of transfusion
  - Lower rate of ICU admission

Memtsoudis et al. Pain 2016
Effect of **Regional anesthesia** on persistent post surgical pain
- Moderate-quality evidence - Reduced risk after thoracotomy and caesarean section
- Low-quality evidence - Reduce the risk after breast cancer surgery

Effect of intravenous infusion of local anaesthetics
- Moderate evidence after breast cancer surgery
NON-OPIOID MEDICATIONS FOR PAIN

- **Herbals**
  - Turmeric, ALA

- **NSAIDs**
  - Selective Cox-2: meloxicam, celecoxib

- **Acetaminophen**

- **Topicals**
  - Lidocaine ointment/patch (OTC as aspercream w/lido), voltaren gel (OTC as emugel)
NON-OPIOID FOR PAIN

- Anticonvulsants
  - Gabapentin, pregabalin, topamax, levitiracetam
- Antidepressants/Anxiolytics
  - TCAs (nortriptyline, amitriptyline),
  - SNRIs (duloxetine, venlafaxine)
- Muscle relaxants
  - Baclofen, cyclobenzaprine, tizanidine
NON-PHARMACOLOGIC OPTIONS

- Ice/heat
- TENS
- Acupuncture
- Massage
- Yoga
- Physical therapy
- Mindfulness/Meditation
- Cognitive behavioral skills
- Biofeedback
CHRONIC OPIOIDS AND WEANING
When to start opioids for chronic pain?

- Presence of clear anatomical source of pain
- Moderate to severe pain having an adverse impact on function or quality of life
- Failure of other conservative methods such as:
  - physical therapy
  - non-opioid medications
- Opioid risk assessment - low/moderate risk for opioid use disorder
- Potential therapeutic benefits outweigh potential harms

The Opioid Risk Tool (ORT)
- five-question
- self-administered assessment
- should be utilized on a patient’s initial visit
- accurately predicted risks of exhibiting aberrant, drug-related behaviors associated with abuse or addiction
AT INITIATION OF CHRONIC OPIOIDS

- Prescription database monitoring should be used in decision making
- An opioid agreement should be signed
- Regular drug monitoring, e.g. urine testing, should be done, at least every 3 months, while patient is maintained on opioids
- Advise to take the opioid medications as sparingly as possible
- Discuss goals of opioid therapy, alternatives, use of concomitant therapy, indications for tapering/discontinuing

Continued use of opioids should be guided by assessing the following 4 areas:

- **Analgesia**: Does the patient derive pain relief?
- **Activity**: Does use of opioids improve activity levels/functioning?
- **Adverse effects**: Are there significant medication side effects?
- **Aberrant behavior**: Is the patient engaging in any inappropriate behavior with regard to opioid medication use—such as frequent request for early refills, perseverating about opioid medication?
17 item self-assessment to monitor patients on maintenance opioid

Questionnaire identifies 6 key issues to determine aberrant medication related behaviors:

- Signs and symptoms of intoxication
- Emotional volatility
- Evidence of poor response to medications
- Addiction
- Healthcare use patterns
- Problematic medication behavior

Simple to score, completed in <10 minutes, score >9 is positive

Dose response relationship between –
- risk of opioid overdose death and
- max daily prescribed dose of opioid

Significant increase in risk of opioid overdose
- \( \geq 50 \text{mg/day MEQ} \) (morphine equivalent)

Adjusted hazard ratios for risk of overdose death
- at \( \geq 100 \text{ MEQ} \) vs 1-20 MEQ => 7.18
- at 50-100 MEQ vs 1-20 MEQ => 4.63
- at 21-50 MEQ vs 1-20 MEQ => 1.88

- Bohnert et al. JAMA 2011.
- Dunn et al. Ann Intern Med 2010
- https://www.cdc.gov/drugoverdose/images/opioids/Opioid_use_in_United_States_RX-300x300.jpg
WHEN TO WEAN OPIOIDS?

- Failure to achieve or maintain anticipated pain relief or functional improvement

- Intolerable adverse effects at minimum dose that produces effective analgesia

- Persistent nonadherence with patient treatment agreement - ex.
  - failure to comply with monitoring,
  - selling prescription drugs, forging Rx, stealing or borrowing drugs,
  - aggressive demand for opioids, unsanctioned dose escalation, concurrent use of illicit drugs,
  - multiple prescribers, multiple pharmacies, recurring ER visits for pain

- Physical, emotional, or social deterioration secondary to opioids

- Resolution or healing of the painful condition

HOW TO WEAN?

- Daily to dose to prevent withdrawal is ~25% of previous days dose
- No published data on speed of tapers in patients on long term opioid treatment for chronic non-cancer pain
- Patients who take PRN opioids less than once daily do not need formal taper

HOW TO WEAN?

- First reduce dose of the medication to the smallest available dose
- Next increase time interval
- Example—wean 10% per week, until last 1/3 then wean 5% per week
- May choose slower wean (ex. 10% per month) for patients who have been on opioid for long term.

OPIOID WITHDRAWAL ONSET

- Symptoms start 2 to 3 half-lives after the last dose of opioid
- Ex. - for oxycodone: $t_{1/2}$ - 3-4 hours; symptoms would start after 6-12 hours
- In this situation, symptoms peak at ~ 48 to 72 hours; symptoms would start after 6-12 hours
- Variability depending on specific dose, speed of taper, and duration of use

Variability depending on specific dose, speed of taper, and duration of use.

- https://americanaddictioncenters.org/withdrawal-timelines-treatments/opiate/
Opoid Withdrawal Symptoms

- Signs and symptoms of **sympathetic stimulation** (from decreased sympathetic antagonism of opioids)
  - Anxiety, Restlessness, Insomnia,
  - Dizziness
  - Hypertension, Tachycardia,
  - Mydriasis, Lacrimation, Diaphoresis,
  - Yawning, Piloerection
  - Tremor, Shivering,
  - Rhinorrhea, Sneezing
  - Nausea, Anorexia
  - Abdominal cramps, Diarrhea,
  - Hot flashes, Myalgias or arthralgias

- Symptoms can be mitigated by use alpha 2 agonist such as clonidine - 0.1mg Q6 hours PO or 0.1mg per 24 hours transdermal patch
CONCLUSION

- Basics of modern pain management
  - Minimize opioids
  - Use multiple modalities
  - Regional anesthesia has strong evidence
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