Non Opioid Approaches to Pain and Musculoskeletal Disorders

KEVIN ODONNELL, DO
FLAGSTAFF BONE AND JOINT

Learning Objectives

▶ Review Opioid Crisis

▶ CDC Guidelines for opioid prescribing

▶ Discuss Alternatives for opioids
Disclosures

- NONE

Chronic Pain and Prescription Opioids

- 11% of Americans experience daily (chronic) pain
- Opioids frequently prescribed for chronic pain
- Primary care providers commonly treat chronic, non-cancer pain
  - account for ~50% of opioid pain medications dispensed
  - report concern about opioids and insufficient training
Sharp Increase in Opioid Prescriptions

Increase in Deaths

Role of Prescribing Opioids and Overdose Deaths

Figure 7. Primary non-heroine opiates/synthetics admission rates, by State or jurisdiction: 2001-2011 (per 100,000 population aged 12 and older)

2001 (range 3 - 56)
2003 (range 0 - 139)
2005 (range -1 - 214)
2007 (range 1 - 341)
2009 (range 1 - 287)
2011 (range 1 - 435)

KEY YEAR: 2001
< 13
13 - 22
23 - 35
36 - 77
78 or more
Incomplete data

NOTE: See Table 1.1b.
SOURCE: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 10/15/12.

Governor Ducey Declares Statewide Health Emergency In Opioid Epidemic

News Release
June 5, 2017

As the number of opioid overdoses and deaths increase at an alarming rate, we must take action.

PHOENIX — Governor Doug Ducey today signed an emergency declaration to address the growing number of opioid deaths in our state.

Newly released data from the Arizona Department of Health Services shows in 2016, 790 Arizonans died from opioid overdoses — an average of more than two people per day. The trend shows an alarming increase of 74 percent over the past four years. Today’s declaration by the governor directs the Arizona Department of Health Services to rapidly respond to this public health emergency.
Opioid death counts among Arizona residents and non-residents in Arizona from 2007 to 2016.

Opioid average 10-Year death rate per 100,000 population by age group from 2007 to 2016.

Hospital opioid-related unique encounter rate per 100,000 population from 2007 to 2016.
State of Arizona Opioid Facts

- Arizona was 15th highest in the nation for drug overdose deaths (2014) and 5th highest in opioid prescribing (2011)
- From 2008-2014, the rate of infants born with Neonatal Abstinence Syndrome rose 245%.

Arizona Department of Health Services mortality data

Neonatal Abstinence Syndrome

[Image of a baby crying]
<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Opioid-Related Encounters</th>
<th>Estimated Costs for Opioid-Related Encounters</th>
<th>Net Annual Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>20,365</td>
<td>$151,535,815</td>
<td>5%</td>
</tr>
<tr>
<td>2010</td>
<td>23,437</td>
<td>$165,227,531</td>
<td>9%</td>
</tr>
<tr>
<td>2011</td>
<td>30,865</td>
<td>$207,568,031</td>
<td>26%</td>
</tr>
<tr>
<td>2012</td>
<td>32,751</td>
<td>$239,380,805</td>
<td>15%</td>
</tr>
<tr>
<td>2013</td>
<td>32,684</td>
<td>$238,423,028</td>
<td>0%</td>
</tr>
<tr>
<td>2014</td>
<td>36,459</td>
<td>$271,082,562</td>
<td>14%</td>
</tr>
<tr>
<td>2015</td>
<td>41,434</td>
<td>$341,457,011</td>
<td>26%</td>
</tr>
<tr>
<td>2016</td>
<td>51,473</td>
<td>Not Available</td>
<td>N/A</td>
</tr>
</tbody>
</table>
91 AMERICANS die every day from an opioid overdose (that includes prescription opioids and heroin).

COMMON CAUSES OF DEATHS: US CITIZENS 2014
How Did We Get Here?
CDC Addresses Need for Opioid Prescribing Guidelines

- Previous opioid prescribing guidelines have been developed by several states and agencies but were inconsistent

- Most recent national guidelines are several years old and don’t incorporate the most recent evidence

- Need for clear, consistent recommendations

Purpose, Use, and Primary Audience

- Internal medicine
- Physicians, nurse practitioners, Primary Care Providers
  - Family medicine physician assistants
- Treating patients >18 years with chronic pain
  - Pain longer than 3 months or past time of normal tissue healing
- Outpatient settings
- Does not include active cancer treatment, palliative care, and end-of-life care
GRADE Method

- Standard for guideline development
- Transparent approach for conducting systematic review, rating quality of evidence, and determining strength of recommendations
- Used by > 100 organizations (including Advisory Committee on Immunization Practices)

Recommendations based on:
- Quality of evidence
- Balance between benefits and harms
- Values and preferences
- Cost

GRADE Evidence Types

- Evidence Types:
  - Type 1: Randomized controlled trials (RCTs); overwhelming observational studies
  - Type 2: RCTs (limitations); strong observational
  - Type 3: RCTs (notable limitations); observational
  - Type 4: RCTs (major limitations); observational (notable limitations) clinical experience
GRADE Recommendation Categories

- Recommendation categories:
  - Category A: applies to all patients; most patients should receive recommended course of action
  - Category B: individual decision making required; providers help patients arrive at decision consistent with values/preferences and clinical situation

Clinical Evidence Review

- 2014 AHRQ sponsored review for NIH Pathways to Prevention
- Updated searches through 2015
- Review of effectiveness of long-term opioid therapy
- Key Questions addressed
  - Effectiveness and comparative effectiveness
  - Harms and adverse events
  - Dosing strategies
  - Risk mitigation strategies
  - Effect of opioid use for acute pain on long-term use
Clinical Evidence Summary

- No long-term (> 1 year) outcomes in pain/function; most placebo-controlled trials ≤ 6 weeks
- Opioid dependence in primary care: 3%-26%
- Dose-dependent association with risk of overdose/harms
- Inconsistent results for different dosing protocols; initiation with LA/ER increased risk of overdose
- Methadone associated with higher mortality risk
- No differences in pain/function with dose escalation
- Risk prediction instruments have insufficient accuracy for classification of patients
- Increased likelihood of long-term use when opioids used for acute pain

Contextual Evidence Review

- **CDC conducted additional review to assess:**
  - Benefits and harms associated with opioid therapy
  - Values and preferences of providers and patients
  - Resource allocation (costs)
  - Effectiveness of non-pharmacologic and non-opioid pharmacologic therapies
Contextual Evidence Summary

- Effective nonpharmacologic therapies: exercise, cognitive behavioral therapy (CBT), interventional procedures
- Effective nonopioid medications: acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), anticonvulsants, antidepressants
- Opioid-related overdose risk is dose-dependent
- Factors that increase risk for harm: pregnancy, older age, mental health disorder, substance use disorder, sleep-disordered breathing
- Providers lack confidence in ability to prescribe safely and are concerned about opioid use disorder
- Patients are ambivalent about risks/benefits and associate opioids with addiction

Organization of Recommendations

- The 12 recommendations are grouped into three conceptual areas:
  - Determining when to initiate or continue opioids for chronic pain
  - Opioid selection, dosage, duration, follow-up, and discontinuation
  - Assessing risk and addressing harms of opioid use
Determine when to initiate or continue opioids for chronic pain

Recommendation #1

- Nonpharmacologic therapy and nonopioid pharmacologic therapy are preferred for chronic pain.
- Clinicians should consider opioid therapy only if expected benefits for both pain and function are anticipated to outweigh risks to the patient.
- If opioids are used, they should be combined with nonpharmacologic therapy and nonopioid pharmacologic therapy, as appropriate.

(Recommendation category A: Evidence type: 3)
Opioids not first-line or routine therapy for chronic pain

- Use nonpharmacologic therapy such as exercise or cognitive behavioral therapy (CBT) to reduce pain and improve function.

- Use nonopioid pharmacologic therapy (nonsteroidal anti-inflammatory drugs, acetaminophen, anticonvulsants, certain antidepressants) when benefits outweigh risks, combined with nonpharmacologic therapy.

- When opioids used, combine with nonpharmacologic therapy and nonopioid pharmacologic therapy to provide greater benefits.

Recommendation #2

- Before starting opioid therapy for chronic pain, clinicians should establish treatment goals with all patients, including realistic goals for pain and function, and should consider how therapy will be discontinued if benefits do not outweigh risks.

- Clinicians should continue opioid therapy only if there is clinically meaningful improvement in pain and function that outweighs risks to patient safety.

(Recommendation category A: Evidence type: 4)
Establish and measure progress toward goals

- **Before initiating opioid therapy for chronic pain**
  - Determine how effectiveness will be evaluated.
  - Establish treatment goals with patients.
    - Pain relief
    - Function
- **Assess progress using 3-item PEG Assessment Scale***
  - Pain average (0-10)
  - Interference with Enjoyment of life (0-10)
  - Interference with General activity (0-10)

*30% = clinically meaningful improvement

Recommendation #3

- **Before starting and periodically during opioid therapy, clinicians should discuss with patients known risks and realistic benefits of opioid therapy and patient and clinician responsibilities for managing therapy.**

*(Recommendation category A: Evidence type: 3)*
Ensure patients are aware of potential benefits, harms, and alternatives to opioids

- Be explicit and realistic about expected benefits.
- Emphasize goal of improvement in pain and function.
- Discuss
  - serious and common adverse effects
  - increased risks of overdose
    - at higher dosages
    - when opioids are taken with other drugs or alcohol
  - periodic reassessment, PDMP and urine checks; and
  - risks to family members and individuals in the community.

Selecting, Dosing, Discontinuing Opioids
Recommendation #4

- When starting opioid therapy for chronic pain, clinicians should prescribe immediate-release opioids instead of extended-release/long-acting (ER/LA) opioids.

(Recommendation category A: Evidence type: 4)

Choose predictable pharmacokinetics and pharmacodynamics to minimize overdose risk

- In general, avoid the use of immediate-release opioids combined with ER/LA opioids.
- Methadone should not be the first choice for an ER/LA opioid.
  - Only providers familiar with methadone’s unique risk and who are prepared to educate and closely monitor their patients should consider prescribing it for pain.
- Only consider prescribing transdermal fentanyl if familiar with the dosing and absorption properties and prepared to educate patients about its use.
Recommendation #5

- When opioids are started, clinicians should prescribe the lowest effective dosage.
- Clinicians should use caution when prescribing opioids at any dosage, should carefully reassess evidence of individual benefits and risks when increasing dosage to ≥50 morphine milligram equivalents (MME)/day, and should avoid increasing dosage to ≥90 MME/day or carefully justify a decision to titrate dosage to >90 MME/day.

(Recommendation category A: Evidence type: 3)

Start low and go slow

- Start with lowest effective dosage and increase by the smallest practical amount.
- If total opioid dosage ≥50 MME/day
  - reassess pain, function, and treatment
  - increase frequency of follow-up; and
  - consider offering naloxone.
- Avoid increasing opioid dosages to >90 MME/day.
- If escalating dosage requirements
  - discuss other pain therapies with the patient
  - consider working with the patient to taper opioids down or off
  - consider consulting a pain specialist.
If patient is already receiving a high dosage

- Offer established patients already taking >90 MME/day the opportunity to re-evaluate their continued use of high opioid dosages in light of recent evidence regarding the association of opioid dosage and overdose risk.
- For patients who agree to taper opioids to lower dosages, collaborate with the patient on a tapering plan.

Recommendation #6

- Long-term opioid use often begins with treatment of acute pain. When opioids are used for acute pain, clinicians should prescribe the lowest effective dose of immediate-release opioids and should prescribe no greater quantity than needed for the expected duration of pain severe enough to require opioids.
- 3 days or less will often be sufficient; more than 7 days will rarely be needed.

(Recommendation category A: Evidence type: 4)
When opioids are needed for acute pain

- Prescribe the lowest effective dose
- Prescribe amount to match the expected duration of pain severe enough to require opioids.
  - Often < 3 days and rarely more than 7 days needed
- Do not prescribe additional opioids “just in case”
- Re-evaluate patients with severe acute pain that continues longer than the expected duration to confirm or revise the initial diagnosis and to adjust management accordingly
- Do not prescribe ER/LA opioids for acute pain treatment

Recommendation #7

- Clinicians should evaluate benefits and harms with patients within 1 to 4 weeks of starting opioid therapy for chronic pain or of dose escalation.
- Clinicians should evaluate benefits and harms of continued therapy with patients every 3 months or more frequently.
- If benefits do not outweigh harms of continued opioid therapy, clinicians should optimize other therapies and work with patients to taper opioids to lower dosages or to taper and discontinue opioids.

(Recommendation category A: Evidence type: 4)
Follow-up

- **Re-evaluate patients**
  - within 1-4 weeks of starting long-term therapy or of dosage increase
  - at least every 3 months or more frequently.

- **At follow up, determine whether**
  - opioids continue to meet treatment goals
  - there are common or serious adverse events or early warning signs
  - benefits of opioids continue to outweigh risks
  - opioid dosage can be reduced or opioids can be discontinued.

Tapering Opioids

- **Work with patients to taper opioids down or off when**
  - no sustained clinically meaningful improvement in pain and function
  - opioid dosages ≥50 MME/day without evidence of benefit
  - concurrent benzodiazepines that can’t be tapered off
  - patients request dosage reduction or discontinuation
  - patients experience overdose, other serious adverse events, warning signs.

- **Taper slowly enough to minimize opioid withdrawal**
  - A decrease of 10% per week is a reasonable starting point

- **Access appropriate expertise for tapering during pregnancy**

- **Optimize nonopioid pain management and psychosocial support**
Assessing risk and addressing harms of opioid use

Recommendation #8

- Before starting and periodically during continuation of opioid therapy, clinicians should evaluate risk factors for opioid-related harms.
- Clinicians should incorporate into the management plan strategies to mitigate risk, including considering offering naloxone when factors that increase risk for opioid overdose, such as history of overdose, history of substance use disorder, higher opioid dosages (>50 MME/day), or concurrent benzodiazepine use, are present.

(Recommendation category A: Evidence type: 4)
Certain factors increase risks for opioid-associated harms

- Avoid prescribing opioids to patients with moderate or severe sleep-disordered breathing when possible.
- During pregnancy, carefully weigh risks and benefits with patients.
- Use additional caution with renal or hepatic insufficiency, aged ≥65 years.
- Ensure treatment for depression is optimized.
- Consider offering naloxone when patients
  - have a history of overdose
  - have a history of substance use disorder
  - are taking central nervous system depressants with opioids
  - are on higher dosages of opioids (≥ 50 MME/day).

Recommendation #9

- Clinicians should review the patient’s history of controlled substance prescriptions using state PDMP data to determine whether the patient is receiving opioid dosages or dangerous combinations that put him/her at high risk for overdose
- Clinicians should review PDMP data when starting opioid therapy for chronic pain and periodically during opioid therapy for chronic pain, ranging from every prescription to every 3 months.

(Recommendation category A: Evidence type: 4)
If prescriptions from multiple sources, high dosages, or dangerous combinations

- Discuss safety concerns with patient (and any other prescribers they may have), including increased risk for overdose.
- For patients receiving high total opioid dosages, consider tapering to a safer dosage, consider offering naloxone.
- Consider opioid use disorder and discuss concerns with your patient.
- If you suspect your patient might be sharing or selling opioids and not taking them, consider urine drug testing to assist in determining whether opioids can be discontinued without causing withdrawal.
- Do not dismiss patients from care—use the opportunity to provide potentially lifesaving information and interventions.

Recommendation #10

- When prescribing opioids for chronic pain, clinicians should use urine drug testing before starting opioid therapy and consider urine drug testing at least annually to assess for prescribed medications as well as other controlled prescription drugs and illicit drugs.

(Recommendation category B: Evidence type: 4)
Use UDT to assess for prescribed opioids and other drugs that increase risk

- Be familiar with urine drug testing panels and how to interpret results.
- Don’t test for substances that wouldn’t affect patient management.
- Before ordering urine drug testing
  - explain to patients that testing is intended to improve their safety
  - explain expected results; and
  - ask patients whether there might be unexpected results.
- Discuss unexpected results with local lab and patients.
- Verify unexpected, unexplained results using specific test.
- Do not dismiss patients from care based on a urine drug test result.

Recommendation #11

- Clinicians should avoid prescribing opioid pain medication and benzodiazepines concurrently whenever possible.

(Recommendation category A: Evidence type: 3)
Avoid concurrent opioids and benzodiazepines whenever possible

- Taper benzodiazepines gradually.
- Offer evidence-based psychotherapies for anxiety.
  - cognitive behavioral therapy
  - specific anti-depressants approved for anxiety
  - other non-benzodiazepine medications approved for anxiety
- Coordinate care with mental health professionals.

Recommendation #12

- Clinicians should offer or arrange evidence-based treatment (usually medication-assisted treatment with buprenorphine or methadone in combination with behavioral therapies) for patients with opioid use disorder.

(Recommendation category A: Evidence type: 2)
If you suspect opioid use disorder (OUD)

- Discuss with your patient and provide an opportunity to disclose concerns.
- Assess for OUD using DSM-5 criteria. If present, offer or arrange MAT.
  - Buprenorphine through an office-based buprenorphine treatment provider or an opioid treatment program specialist
  - Methadone maintenance therapy from an opioid treatment program specialist
  - Oral or long-acting injectable formulations of naltrexone (for highly motivated non-pregnant adults)
- Consider obtaining a waiver to prescribe buprenorphine for OUD (see [http://www.samhsa.gov/medication-assisted-treatment/buprenorphine-waiver-management](http://www.samhsa.gov/medication-assisted-treatment/buprenorphine-waiver-management))

TOOLS AND RESOURCES
Tools and Materials

- Provider and patient materials
  - Checklist for prescribing opioids for chronic pain
  - Fact sheets
  - Posters
  - Web banners and badges
  - Social media web buttons and infographics

- CDC Opioid Overdose Website
  www.cdc.gov/drugoverdose/index.html
Overwhelmed?

Problems with Guidelines

- Require more expertise and attention than most PCP’s have
- Non-opioid treatments can be expensive and difficult to obtain
- Conflict of interest in healing suffering and doing no harm
- Doing right vs patient satisfaction
- Pain Management often not available or consistent with approach
What Else Can We Offer to These Patients?

Pain is inevitable. Suffering is optional.

“If you don't know where you are going, you'll end up someplace else.”

— Yogi Berra
Pain Types

- **Nociceptive**
  - Tissue Damage—stubbed toe to OA
- **Neuropathic**—sciatica to peripheral neuropathy
- **“Other”**—Fibromyalgia, “Non-specific LBP”, CRPS
Nociceptive pain:
Nociceptors in tissues send pain signals to the CNS.

Neuropathic pain:
Damage to the nerve itself causes typical pain symptoms.

---

**Table 1 – Types of pain**

<table>
<thead>
<tr>
<th></th>
<th>Nociceptive (somatic)</th>
<th>Nociceptive (visceral)</th>
<th>Neuropathic pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td>Aching</td>
<td>Crampy</td>
<td>Burning</td>
</tr>
<tr>
<td></td>
<td>Intense</td>
<td>Deep</td>
<td>Dysesthesia</td>
</tr>
<tr>
<td></td>
<td>Sharp</td>
<td>Squeezing</td>
<td>Paresthesia</td>
</tr>
<tr>
<td></td>
<td>Stabbing</td>
<td></td>
<td>Lancing</td>
</tr>
<tr>
<td>Signs</td>
<td>Tenderness</td>
<td>Autonomic sensations</td>
<td>Allodynia</td>
</tr>
<tr>
<td></td>
<td>Positional</td>
<td>Poorly localized</td>
<td>Hyperpathia</td>
</tr>
<tr>
<td></td>
<td>Incident pain*</td>
<td></td>
<td>Tinel sign</td>
</tr>
<tr>
<td></td>
<td>Localized</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>Repair etiology</td>
<td>Repair etiology</td>
<td>Reduce nerve</td>
</tr>
<tr>
<td></td>
<td>Reduce inflammation</td>
<td>Neural blocks (oncological origin)</td>
<td>compression</td>
</tr>
<tr>
<td></td>
<td>NSAIDs</td>
<td>Opioids</td>
<td>Anticonvulsants</td>
</tr>
<tr>
<td></td>
<td>Opioids</td>
<td>Tricyclic antidepressants</td>
<td>Antidepressants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anticonvulsants</td>
<td>Topical agents†</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Neural blocks</td>
</tr>
</tbody>
</table>

*Incident pain is pain aggravated by movement.
†Lidocaine patch, topical capsaicin.
To best take care of your patient, you must try to identify pain generator and/or pain type

Nociceptive Pain treatment is traditional

- NSAIDS
- ICE
- Opioids
- Steroids
Neuropathic Pain Quality and Treatment is Not Traditional

- Burning
- Searing
- Burning
- Numbing
- Lancinating
- Electric
- Raw

Alternatives and Adjuncts to Opioids for Chronic Painful Conditions

- Get the Right Diagnosis (name the pain)
- Identify co-morbid psychiatric, endocrine, nutritional issues (mood d/o, Vit D deficiency)
- Physical Therapy and Exercise Therapy
- Medications
  - NSAIDS and Acetaminophen
  - Antidepressants
  - Anticonvulsants
  - Topical Agents
  - Antispasmodics
  - Botox
  - Benzodiazepines
  - Cannabis
Additional Alternatives and Adjuncts to Opioids

- Behavioral Therapy (CBT, Biofeedback, Psychotherapy)
- Osteopathic Manipulation
- Neuromodulation (TENS and Spinal cord stimulators)
- Interventional and Regenerative (Botox, Trigger points, Steroid, Stem Cells and PRP)
- Surgery

A Sampling of the Options...
“To find Health should be the object of the physician. Anyone can find disease.”

-A.T. Still
Osteopathic Tenets

1. The body is a unit; the person is a unity of body, mind, and spirit
2. The body is capable of self-regulation, self-healing, and health maintenance
3. Structure and function are reciprocally interrelated
4. Rational therapy is based upon an understanding of the basic principles of body unity, self-regulatory mechanisms, and the interrelationship of structure and function

“He [the osteopath] should never dally with effects but ever go back to the cause, which when corrected results in a disappearance of the effect.” — Research and Practice, AT Still
**Conclusion:**

Clinically relevant effects of OMT were found for reducing pain and improving functional status in patients with acute and chronic nonspecific LBP...

---

What I do as a Physician...

Regenerative and Minimally Invasive Procedures for Acute and Chronic Pain
Chronic Tendon and Soft Tissue Injuries Treated with Regenerative Medicine

Traditional Treatment

Open Surgery for Calcific Tendonitis

Arthroscopy
Ultrasound Guided Needle Barbatoge

Orthobiologics

- Using biologic agents to prompt, stimulate, or support a healing process
- Rapidly evolving field
- Many promising studies
- Safe and often very effective
Pro Catabolic to Pro Anabolic
Regenerative Biologics and Stem Cell Therapy for Chronic Musculoskeletal Pain

- Adipose Derived Stem Cells
- BMAC
- Placental and Amnion Derived Cells
- Platelet Rich Plasma
BMAC Procedure

Take Home Points...

- Identify the pain generator and understand Anatomy
- Just because you call something non-specific doesn’t make it so
- Know your anatomy and your pain types
- Understand Co-morbid psychiatric and pyschosocial stressors
- Don’t start Opioids unless you’ve tried something (Anything Really) Else
Thank You!