

*Post-Operative Pain: The role of patient expectations, pre-operative counseling, and non-opioid treatment options*

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KISAN PARIKH, MD – RESIDENT PHYSICIAN

KIMBERLY TEMPLETON, MD – PROFESSOR OF ORTHOPEDIC SURGERY

UNIVERSITY OF KANSAS MEDICAL CENTER

# Post-operative pain

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- Introduction and scope of problem
- Multi-modal analgesia
  - Regional and/or local
  - Acetaminophen
  - NSAIDs
  - Gabapentinoid agents
- Prescribing Guidelines
- Patient Education
- Concluding thoughts and questions



# Opioid Epidemic

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- United States Opioid problem
  - Estimated to consume 80% of world's narcotics, 99% of hydrocodone [Manchikati et al.]
- Increase in prescribing since the 1990s
  - Focus on pain as a “vital sign”
  - American Pain Society and Agency for Healthcare Research and Quality
  - Increased number of formulations and advertising

# Controlling post-op pain

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- Patients need adequate pain control.
  - Reduce suffering
  - Allow early mobilization
  - Improve function
- Opioids are effective for acute pain
  - Side effects
  - Addiction
  - Overdose
  - Diversion
  - Transition to illicit opiates

# Multi-modal analgesia

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- Using medications of different classes, mechanisms of action, and routes of administration
- Treat pain at various points in pain transmission pathway
- Decrease need for opioids peri-operatively
- Provide options for patients who are opioid intolerant
- Promote early mobilization

# Regional blocks

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- Use of local anesthetic to provide pain relief
- Regional blockade – inject anesthetic near nerve
  - Block sensory distributions to decrease painful stimuli
  - Can have motor blockade
- Total knee arthroplasty patients receiving adductor canal block
  - Decreased morphine consumption, improved pain control, improved functional testing
- Fascia Iliaca Block for hip fractures
  - Decreased pain, decreased morphine consumption (Foss et al)



**NYSORA**  
THE NEW YORK SCHOOL OF REGIONAL ANESTHESIA

Photo: [nysora.com](http://nysora.com)

# Local Infiltration

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- Inject local anesthetic in the area of operation
- Cocktails of medication including: Local anesthetic, NSAIDs, morphine, epinephrine
- Decreased opioid use compared to placebo
- Potential benefits involving length of stay and function (Jiang et al)

# Acetaminophen

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- Widely used analgesic and anti-pyretic
- Decrease overall narcotic use in hip and knee arthroplasty  
(Sinatra et al. )
- IV versus oral formulation (Jibril et al.)
- Relatively safe in healthy adults
  - Acute overdose in high doses
    - Combined formulations with opioids
    - Caution in patients with hepatic disease or chronic alcohol use

# Non-steroidal Anti-Inflammatories

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- Inhibit COX enzymes which mediate inflammatory response
- Immediate post operative use of Toradol decreases morphine requirements
- Oral NSAIDs can decrease narcotic consumption, improve pain scores
  - Six weeks of use following total knee arthroplasty (Schroer et al)
  - Comparable analgesic effect to Norco after ambulatory procedures (Gimbel et al)

# Adverse effects of NSAIDs

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- Potential adverse effects
  - GI – including ulcers and bleeding
  - Renal injury in large doses
- Selective versus non-selective
  - Selective COX-2 inhibitors can have decreased side effect
  - Theoretical increased thrombosis and myocardial infarction
    - Large studies show no difference in adverse cardiovascular events comparing celecoxib to control and non-selective NSAIDs (White et al.)
  - Interference of bone and soft tissue healing ?

# Gabapentinoid Drugs

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- Typically used for neuropathic-type pain
- Act on central nervous system
- Patients receiving gabapentin peri-operatively show decreased opioid consumption, nausea, and pruritic after total knee arthroplasty Zhai et al.)
- Similar results in spinal surgery (Marquez-Lara et al.)
- Central mechanism of action means sedation can be an adverse effect

# Multi-modal analgesia

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- Addressing pain from different avenues can improve pain control
  - Regional blocks
  - Local infiltration
  - Acetaminophen
  - NSAIDs
  - Gabapentinoids
- Decreased need for opioids can reduce the associated adverse effects and potential for misuse
- Tailor regimen for individual patients to reduce suffering, maximize function, minimize side effects

# Prescribing of Opioids

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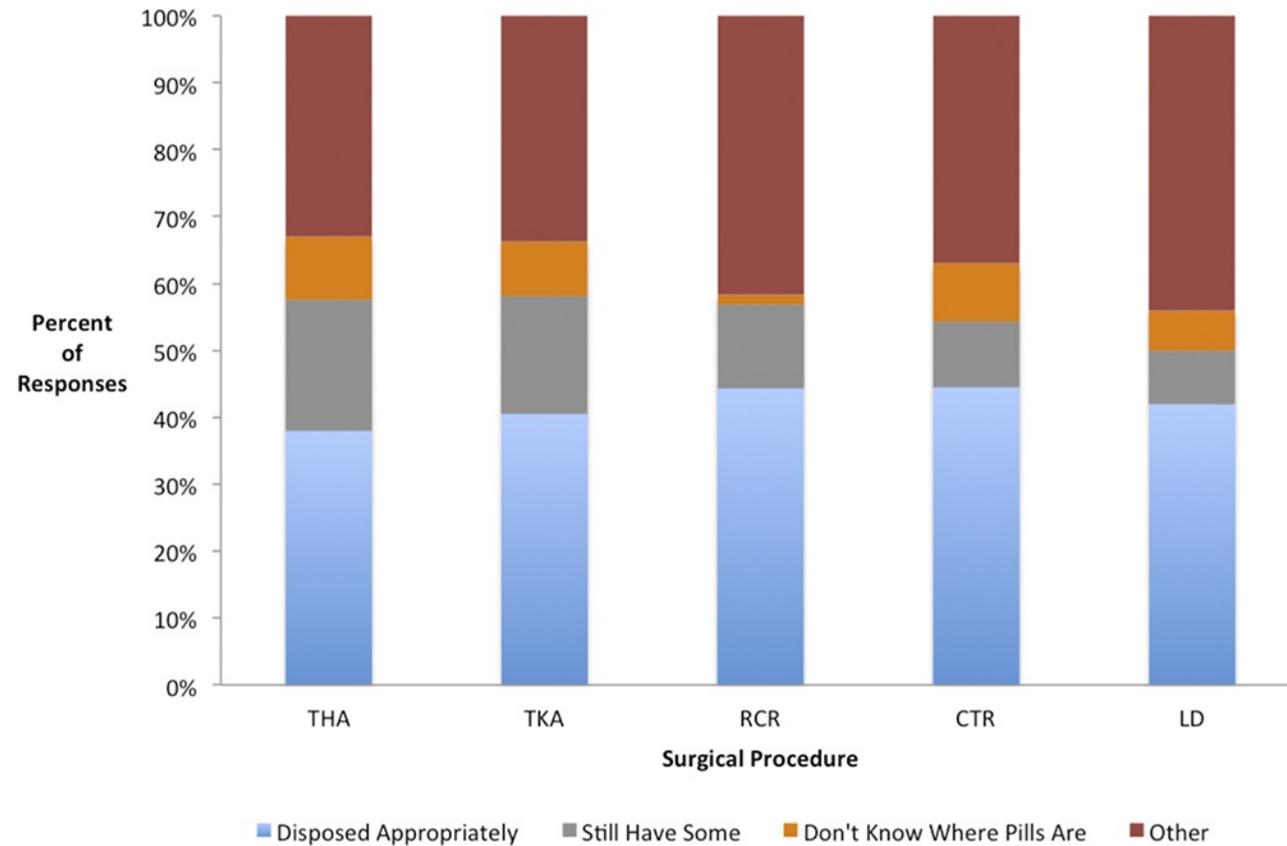
- CDC provides guidelines related to opioid prescription for acute pain:
  - Lowest effective dose of immediate acting opioid
  - Caution with >50 MME/day, use longer than 1-4 weeks
- Guidelines and protocols – Recommendations not mandates
  - Typically approached with hesitation
  - “Setting expectations of the use of opioids with a “pain management protocol” undermines shared decision-making and creates the specter of paternalism and coercion when introduced in the postoperative period. I am unaware of any evidence that pain protocols successfully reduce the incidence of narcotic dependence. In addition, adherence to a pain protocol violates the trust necessary for a successful outcome and may lead to patient abandonment if the pain management problem is not resolved.” – Response to The Opioid Epidemic – Impact on Orthopedic Surgery (JAAOS 2015)

# Prescribing Practices

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- Sabatino et al. tracked prescribing for total hip/knee arthroplasty, rotator cuff repair, carpal tunnel release, lumbar surgery
  - Wide variety of prescribing for similar procedures
  - 61% reported unused opioid pills
- Significant variation and over-prescribing in other fields including general surgery and urology (Thiels et al, Bates et al. )
- Using inpatient usage to predict outpatient need has pitfalls as well (Chen et al.)

# Disposal of excess opioids



Sabatino et al.  
JBJS Feb. 2017

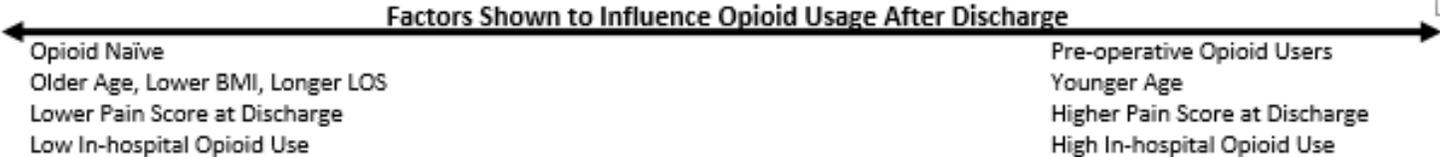
# Guidelines

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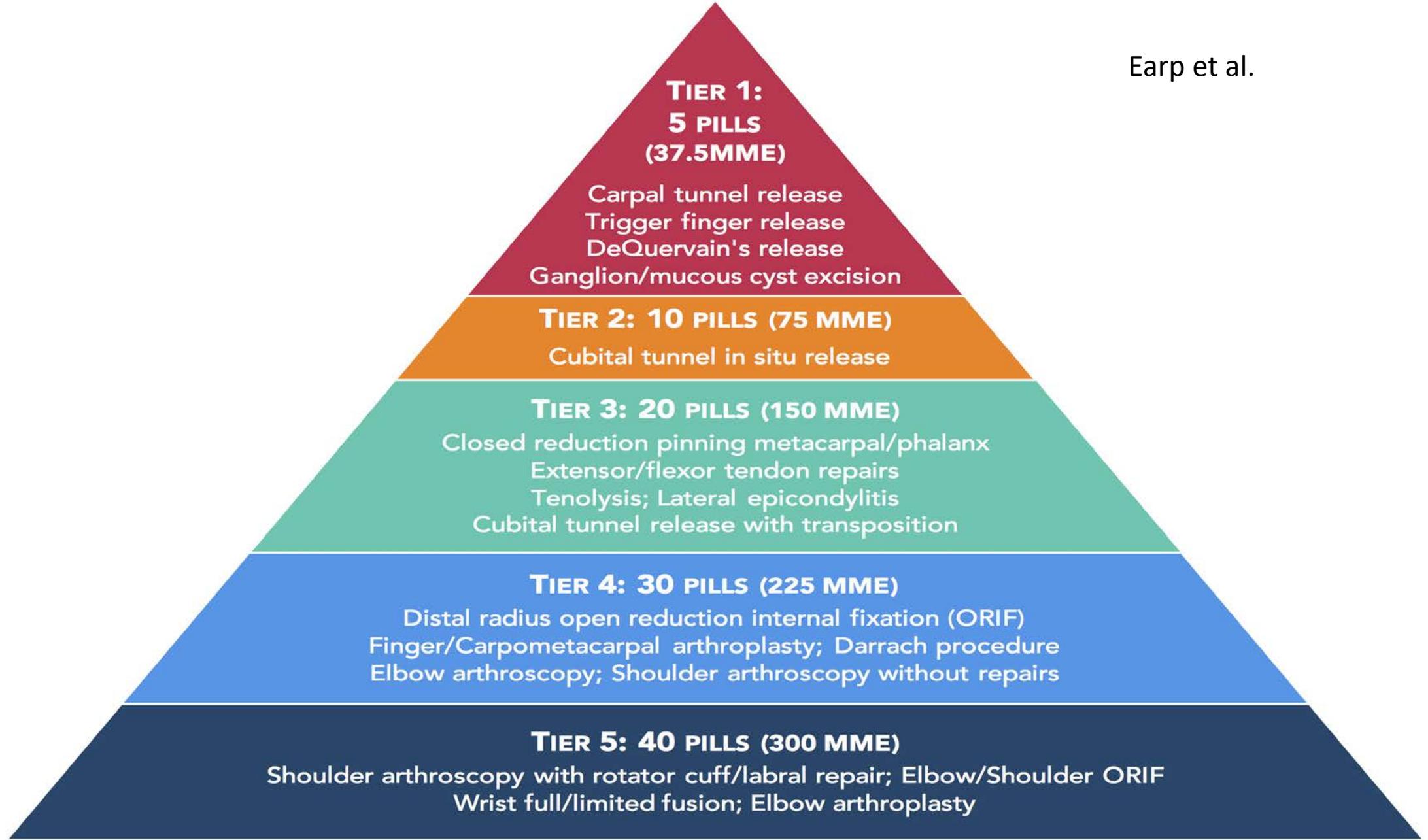
- Thiels et al. developed guidelines for 25 common surgical procedures
  - Categorized high and low opioid dosing tiers based on pre-operative narcotic use
  - Focus on maximum recommendations
  - Decreased narcotic prescribing, patient satisfaction remained similar
- Earp et al. focused on common upper extremity procedures
  - Decrease in opioids prescribed without increase in number of refills written
- Effect on patient satisfaction
  - Hospital survey data: satisfaction related to overall rating, pain medication, nor communication regarding medication was not associated with opioid consumption after knee surgery (Etcheson et al.)
- Is it the guidelines or the improved prescriber education?
  - Spillover effect to procedures not included in guidelines (Howard et al)

**Mayo Clinic Surgical Outcomes Program Recommendations for Adult Discharge Opioid Prescriptions**  
 (# of Tabs of 5 mg Oxycodone or 50 mg Tramadol)

<b>Vascular, Thoracic &amp; Endocrine</b>	Bronchoscopy or Upper Endoscopy (±Dilation)	NSAIDs/Acetaminophen Only	NSAIDs/Acetaminophen Only	NSAIDs/Acetaminophen Only
	Percutaneous Endovascular or Vascular Access Procedures (Cut-downs, Complex Endovascular, and AV Superficialization may require additional opioids)			5 Tabs Oxycodone OR* 10 Tabs Tramadol
	Carotid Endarterectomy			8 Tabs Oxycodone OR* 12 Tabs Tramadol
	Thyroid/Parathyroid Surgery, Mediastinoscopy, or POEM			10 Tabs Oxycodone OR* 15 Tabs Tramadol
	VATS Procedure (Pulmonary or Mediastinal)	20 Tabs Oxycodone OR* 30 Tabs Tramadol	40 Tabs Oxycodone OR* 60 Tabs Tramadol	
	Thoracotomy (Pulmonary, Pleural, or Chest Wall)	5 Tabs Oxycodone OR* 8 Tabs Tramadol	50 Tabs Oxycodone OR* 80 Tabs Tramadol	60 Tabs Oxycodone OR* 100 Tabs Tramadol



Clinical judgment and division level guidelines should supersede these recommendations as indicated.



# How much to prescribe?

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- Some evidence to guide prescribing
  - Median consumption of 7 hydrocodone 5 mg tabs after knee arthroscopy (Wojahn et al.)
  - Carpal tunnel release patients use 10 pills of either oxycodone, acetaminophen, or ibuprofen with similar pain scores and usage (Ilyas et al.)
  - Expert opinion and institutional consensus is a good starting point

# Patient Factors

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- Prior Opioid Use
- Risk factors for misuse or dependence
  - Depression
  - History of misuse
  - Sex-based differences

# Patient Education

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- Responsible prescribing practices are important, however, patient education is crucial
- Patients experience pain differently
  - Cultural perceptions (Carragee et al.)
    - 25 patients with femoral shaft fractures in Vietnam and United States
    - 0.9 mg/kg morphine equivalents per day versus 30.2 mg/kg
    - 8% felt pain control inadequate versus 80% in US group
    - Patient expectations matter
  - Sex-based differences
  - Anxiety sensitivity and Depression (Hina et al., Aceto et al.)

# Does patient education work?

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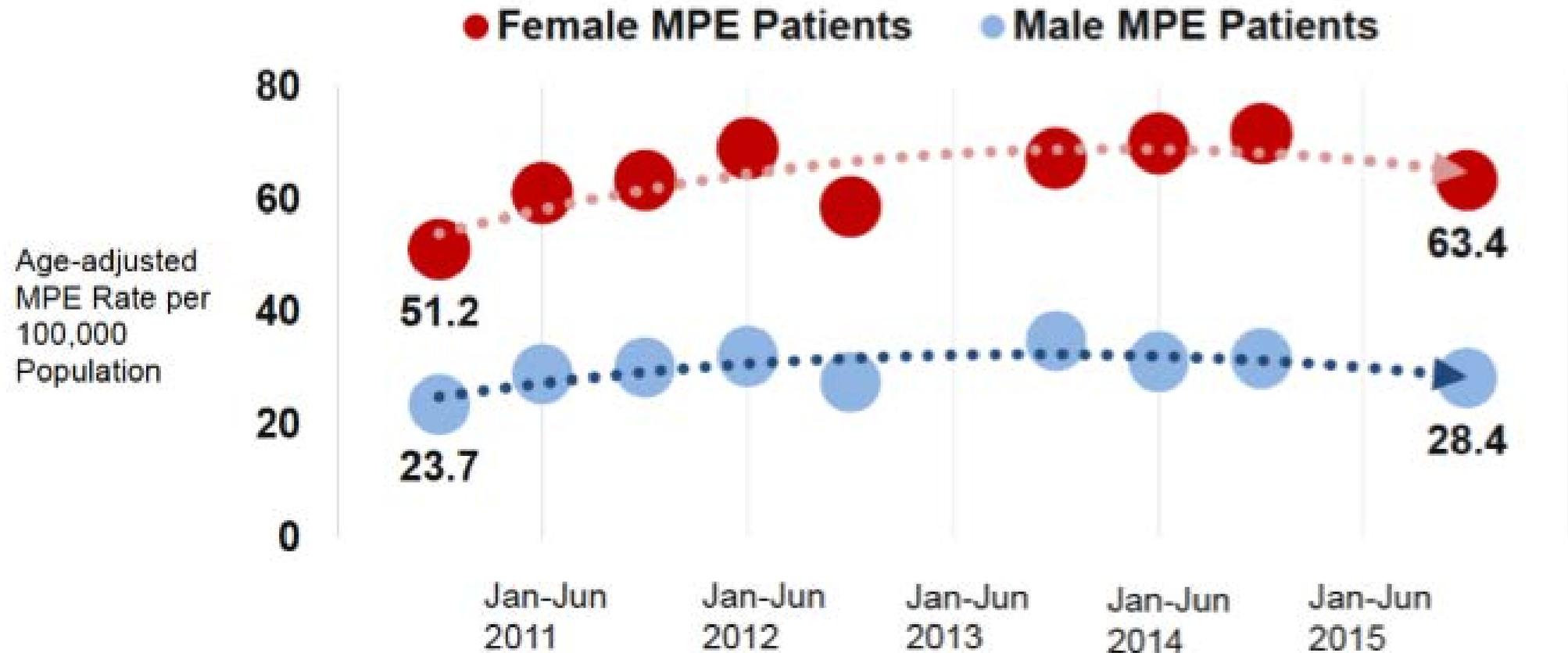
- Simple interventions can have an impact:
  - 2-minute video describing adverse effects and risks associated with narcotics (Syed et al.)
    - Patients with pre-operative use 6.8x as likely to cease use in post-op period after rotator cuff surgery
    - Decreased opioid consumption and shorter time to cessation
  - Memory prompt card for prescribers for discussion of misuse and diversion and to set expectation of cessation of opioid use post operatively (Stanek et al.)
    - Decreased prescription refill requests after hand surgery
  - Standardized patient instructions to start with non-opioid medications after breast surgery (Lee et al)
    - Decreased prescribing due to new guidelines
    - No increase in refill requests despite this

# Involving patients in the process

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- Simply decreasing the amount of opioid prescribed is not enough
- Orthopedic trauma and arthroplasty patients have demonstrated multiple provider episodes for narcotics at rates up to 20% (Morris et al., Nickel et al.)
  - Majority of patients with multiple provider encounters are female (K-TRACS)
  - Diversion concerns
  - Unaddressed concerns regarding pain
  - Unrealistic expectations of pain relief

# Females account for almost two-thirds of MPE rates



**Data Source:** Kansas Board of Pharmacy, Kansas Tracking and Reporting of Controlled Substance (2010-2012, 2015). Kansas population was based on the U.S. Census County Vintage 2015 post-censal estimate of the resident population of the United States by single year of age, bridge-race category and age-adjusted to the U.S. 2000 standard population. **Credit:** Images created by Iconarray.com, Risk Science Center and Center for Bioethics and Social Sciences in Medicine, University of Michigan. Accessed 2016-08-19. Comparison of indicators do not imply statistical significance. Each point estimate may include the same patients.

# Concluding Thoughts

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- Pain control is important and we must optimize patient function post operatively
- Opioids can be effective for acute pain but should be part of a multi-modal approach
- Prescribing guidelines can be beneficial but should consider patient factors
- Patient education is critical
- Questions?

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