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#### **Pediatric Orthopaedic Surgery**

#### • Musculoskeletal conditions

**+ Upper extremity +**Lower extremity **\***Spine (neck to sacrum) Conditions Trauma **+ Deformity \***Congenital **\***Acquired **+**Tumors **+**Syndromes Prader-Willi Syndrome

Arthrogryposis







#### Pain Is Inherent to Our Specialty

• Patients present with pain **+Fractures/injuries +Infections** Tumors Corrective surgery includes pain

Relatively few chronically painful conditions







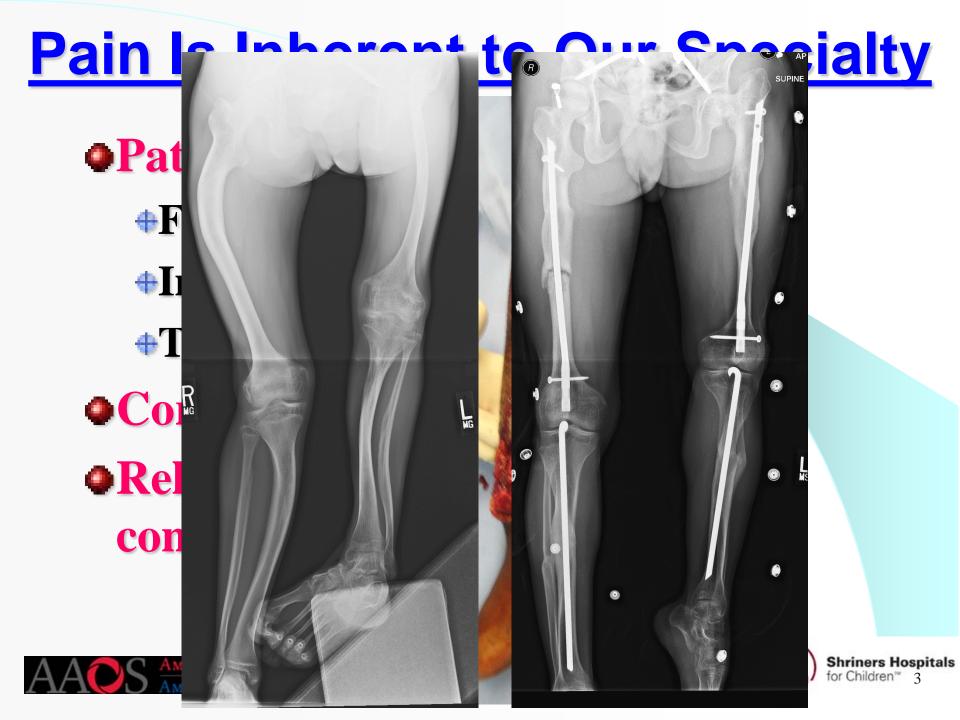
#### Pain Is Inherent to Our Specialty

Patients preser **+Fractures/inju +Infections +**Tumors Corrective sur Relatively few **conditions** 

#### pain unful







#### Pain Management Is Important

 Young patients have keen awareness of pain

Do not always understand why they are subjected to pain

• Identification of "post-traumatic stress disorder"

Need for several procedures









#### Pain Management

#### Non-steroidal anti-inflammatory drugs

- Ibuprofen
- Naproxen
- +Ketorolac
- Analgesics
  - Acetominophen
- Opioids

#### **+Intravenous**









#### Disadvantages of Opioid Medications

Respiratory depression
Gastrointestinal dysfunction (ileus)
Nausea, itching, confusion
Habituation/dependence
Abuse potential







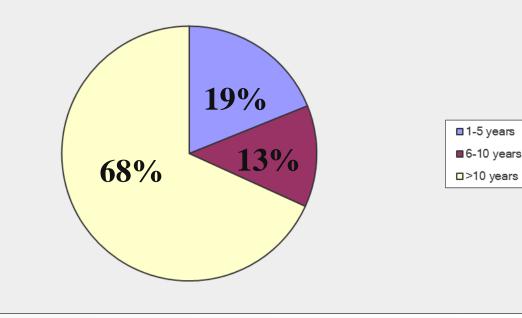




#### Pediatric Orthopaedic Society of North America

#### • 264 respondents (~25% of membership)

How many years have you been in practice?



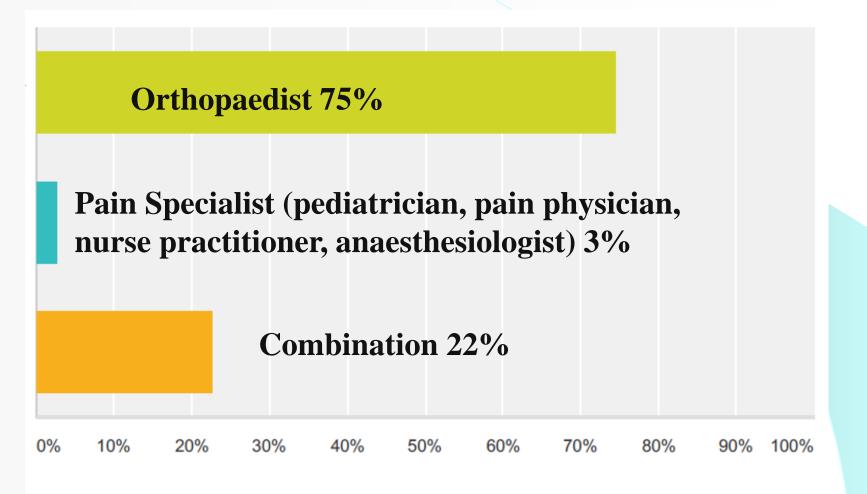


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#### Who Directs Outpatient Pain Management?





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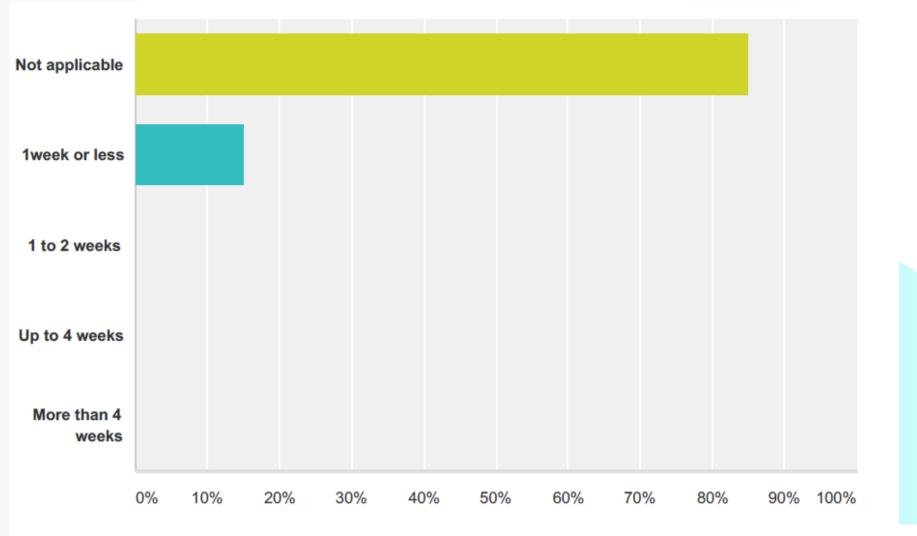




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#### Outpatient Fracture Reduction and Casting





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#### Outpatient Fracture Reduction and Casting

**No nar**cotics 32%

**Hydrocodone (Norco, Vicodin) 46%** Oxycodone/Oxycontin 14% Acetaminophen with codeine (Tylenol #3) 19%

#### Not Applicable 2%

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%



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#### **Outpatient Fracture Reduction and Casting**

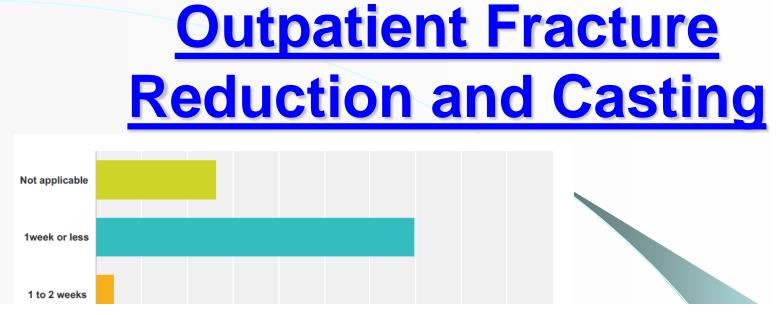
Not applicable										
1week or less										
1 to 2 weeks										
Up to 4 weeks										
More than 4 weeks										
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%





100%





#### Ibuprofen - main alternative

#### •Some preferred instantaneous release oxycodone over Oxycontin (E.R.)

#### **+Speed of onset**

#### **+State pressure to reduce opioid deaths**

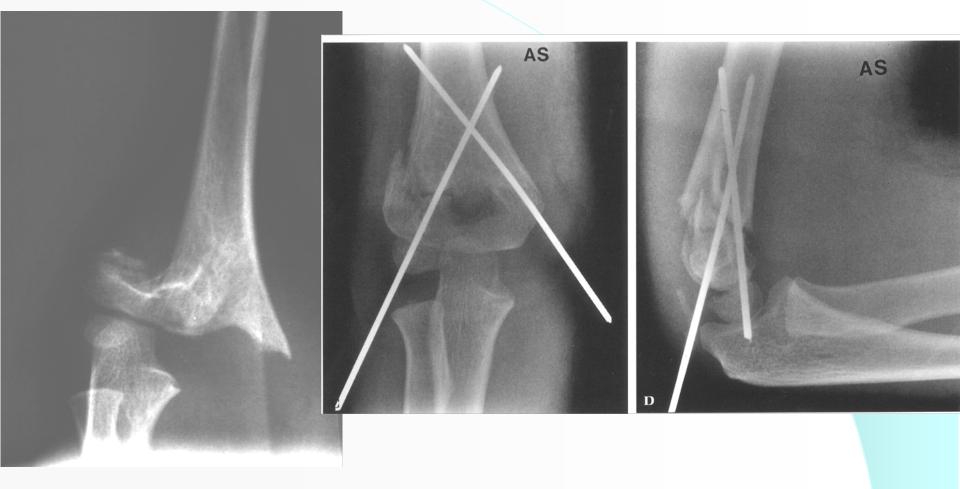








#### **Simple Operative Fracture**





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#### **Simple Operative Fracture**

No narcotics 11%

Hydrocodone (Norcoș Vicodin) 55% AS **Oxycodone/Oxycontin 26%** Acetaminophen with codeine (Tylenol #3) 21% **Oral Morphine (MS Contin, Duramorph) 1%** Hydromorphone (Dilaudid) Nalbuphine (Nubain) 0.4% Tramadol (Ultram) 1.6% Not Applicable 1.6%

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30%

40%

50%

60%

20%

0%

10%



70%

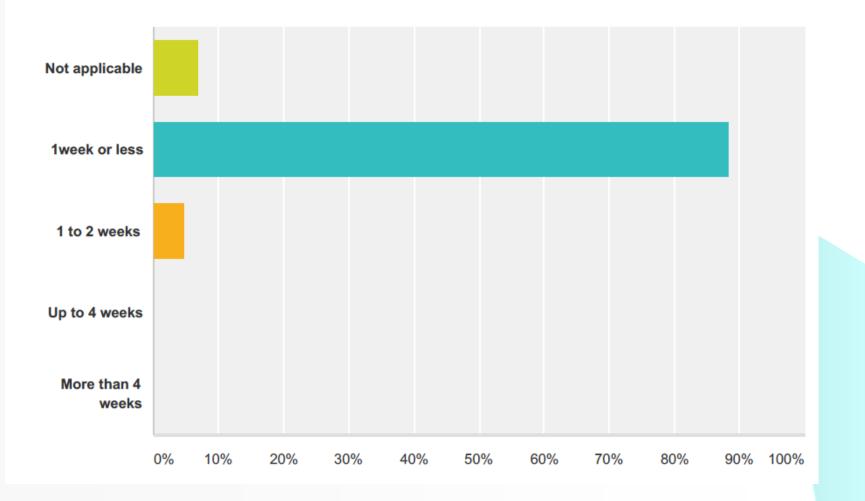
80%

90%

100%



#### **Simple Operative Fracture**





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#### Knee Arthroscopy



Arthroscopic instrument



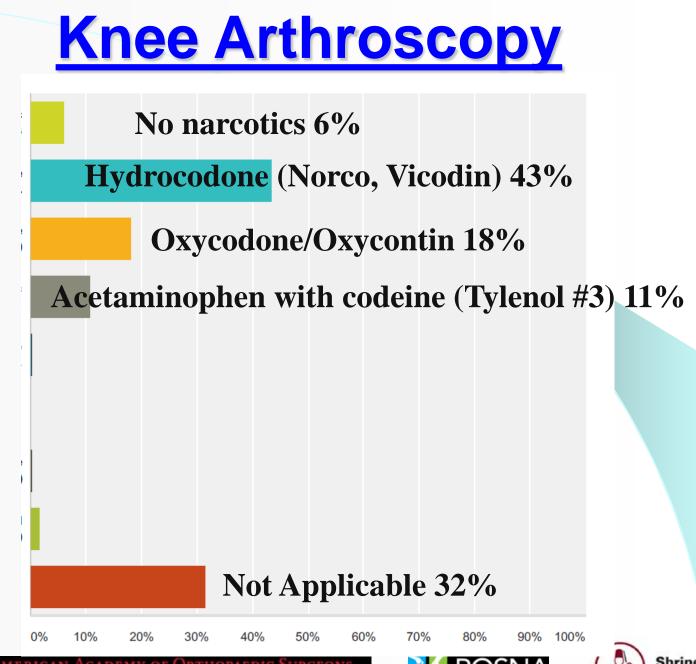
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Not applicable										
1week or less										
1 to 2 weeks										
Up to 4 weeks										
More than 4 weeks										
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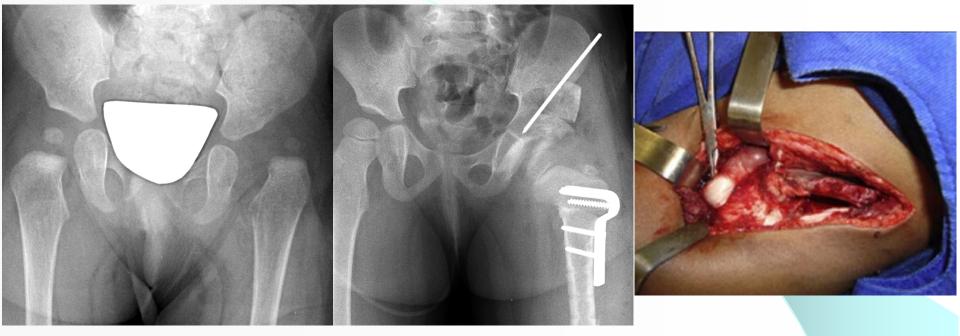


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#### **Hip Procedure Young Child**







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#### **Hip Procedure Young Child**

No narcotics 4%

Hydrocodone (Norco, Vicodin) 58%

**Oxycodone/Oxycontin 28%** 

Acetaminophen with codeine (Tylenol #3) 16%

Oral Morphine (MS Contin, Duramorph) 1.7%

Hydromorphone (Dilaudid) 2.5%

Nalbuphine (Nubain) 0.4%

Tramadol (Ultram) 0.8%

#### Not Applicable 6%

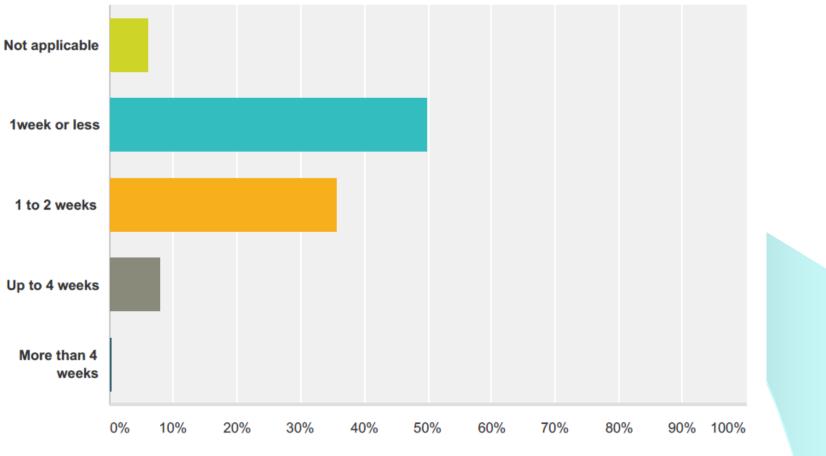
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#### **Hip Procedure Young Child**



#### Hycet – acetaminophen/hydrocodone

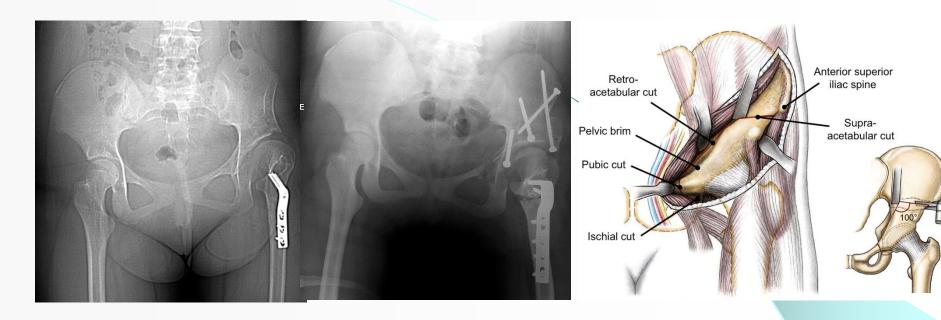


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#### **Hip Procedure Older Child/Teen**





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#### **Hip Procedure Older Child/Teen**

No narcotics 5%

Hydrocodone (Norco, Vicodin) 62%

**Oxycodone/Oxycontin 30%** 

Acetaminophen with codeine (Tylenol #3) 14%

Oral Morphine (MS Contin, Duramorph) 1% Hydromorphone (Dilaudid) 2%

Tramadol (Ultram) 2%

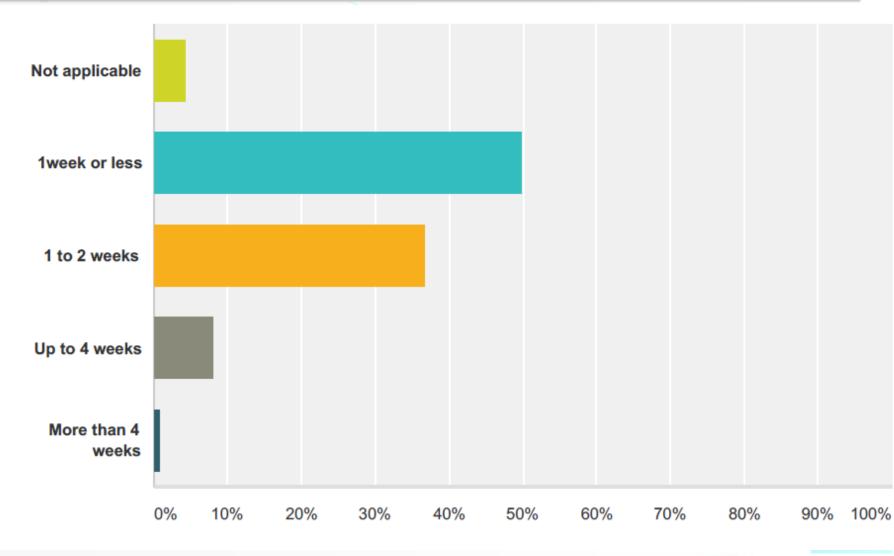
Not Applicable 4%

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%





#### **Hip Procedure Older Child/Teen**





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#### **Spinal Fusion**





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No narcotics 1%

Hydrocodone (Norco, Vicodin) 34%

**Oxycodone/Oxycontin 34%** 

Acetaminophen with codeine (Tylenol #3) 7%

Oral Morphine (MS Contin, Duramorph) 4%

Hydromorphone (Dilaudid) 4%

Nalbuphine (Nubain) 0.4%

Tramadol (Ultram) 2%

30%

Not Applicable 35%

70%

80%

60%

0%

10%

20%

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40%

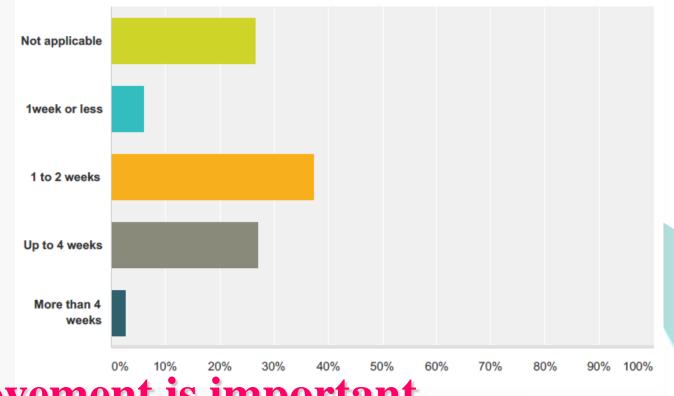
50%



90% 100%



#### **Spinal Fusion**



#### •Movement is important

#### Oral medications less constipating than IV

#### Return to school 4-8 weeks

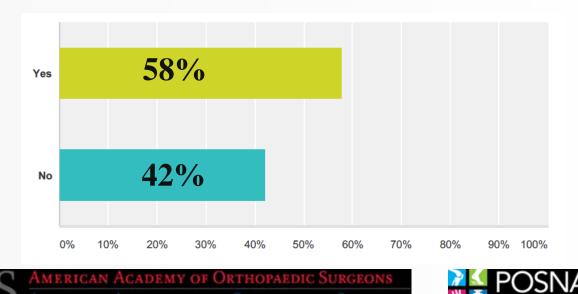
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## Narcotics as Backup Plan State specific narcotic prescription rules No telephone prescriptions, paper only Situations with lower probability of pain \* "Prophylactic" narcotic prescription?

**+Distance and "middle of night"** 







# Pre- or Non Surgical Patients Prescribed narcotics for painful conditions Prior to any surgical treatment No fracture







No

0%

10%

85%

20%

30%

40%

50%

60%

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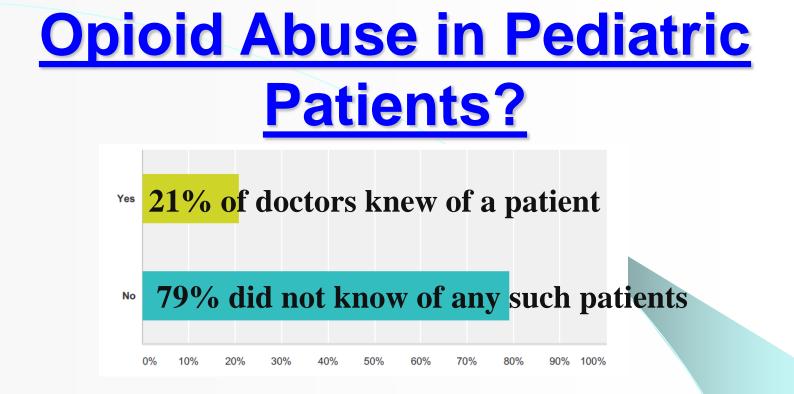
70%

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### Patients with chronic pain conditions Patient selling their pills Some had unconfirmed suspicions

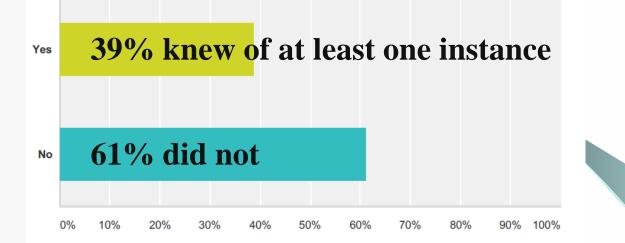








#### **Opioid Abuse by Patient's Family?**



### Some estimated at 0.5% of events Many had unconfirmed suspicions Especially in cases of refill requests Occasional "fictitious pain"









#### **Conclusions**

- Outpatient opioids in pediatric orthopaedics
   Very important for pain management
   Widely used
   Decrease hospital stays
- Oxycodone (immediate release or Oxycontin)
  - **+ Used in 14% to 34% of instances**
  - More often in more painful procedures
  - Should be initially trialed in hospital with patient days prior to discharge











#### Length of use

- + Less than one week for most situations
- Only the most extreme situations call for treatment up to 4 weeks
- **+ Medications refilled only rarely**
- "Prophylactic" prescribing

Need new strategies







#### **Conclusions**

#### Abuse

- Potential well recognized
- Ever vigilant
- Teach parents
  - **\*** Warning signs (sedation, nausea, dizziness)
  - **\***Only parents can dispense drugs
  - **\* Keep journal of medication use**

#### More research

Pediatric pain management strategies
Methods to prevent abuse

















