

SAFE USE OF OPIOIDS IN HOSPITALS



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IntNSA Webinar Series

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Objectives

- Describe the common causes for adverse events associated with opioid use in hospitals
- Outline evidence-based actions and a systems approach to avoid opioid related adverse events
- Discuss management of acute pain in patients with substance abuse disorder

Case

A 56 year-old, 280 lb male is on methadone maintenance 80mg daily for a remote history of polysubstance abuse including Oxycontin. He is now about to undergo lumbar surgery in 1 month for back pain and radiculopathy. He has a lot of anxiety about uncontrolled postop pain and is requesting lorazepam perioperatively.

- Provide several options for the patient's perioperative pain control plan.
- What are his risks for opioid safety?
- Discuss goals and plans for pain management following hospital discharge

JC Sentinel Event Alert

- Lack of knowledge about potency differences among opioids
- Improper prescribing and administration of multiple opioids and modalities of opioid administration (i.e., oral, parenteral and transdermal patches)
- Inadequate monitoring of patients on opioids

Issue 49, August 8, 2012

Characteristics of patients at risk for oversedation and respiratory depression

- Increased opioid dose requirement or opioid naive
- Longer length of time receiving general anesthesia
- Receiving other sedating drugs such as benzos, antihistamines, sedatives, or other CNS depressants
- Preexisting pulmonary or cardiac disease or dysfunction or major organ failure
- Obstructive (obesity) or central sleep apnea
- Surgical incisions that may impair breathing
- Older age (2.8X higher 61-70, 5.4X age 71-80, 8.7X age>80)
- Smoker

Commonly Used IV Opioids

	Hydromorphone	Morphine	Fentanyl
Potency	7x > morphine	–	100x > morphine
Onset of Effect	~5 min	~6 min	~2 minutes (highly lipophilic)
Peak Effect	~15-20 min	~20 min	~4-5 min
Duration of Action	~1-3 hr	~96 min-4 hr	~30-60 min
Active Metabolites	No	Yes M6G: opioid agonist M3G: Neuroexcitatory, anti-analgesic effects	No

0.2mg of IV hydromorphone is approximately equal to 1.3mg of IV morphine
 2.0 mg of IV hydromorphone is approximately equal to 13.3 mg of IV morphine or 40mg PO morphine!

Stuart-Harris R et al., Br J Clin Pharmacol 2000;49:207-214; Upton RN et al., Clin Pharmacokin 1997;33(3):225-244; Valner JJ et al., J Clin Pharmacol 1981;21:152-156.

Respiratory Depression

- Less than 8-12 breaths per minute
- A vicious cycle
 - Progressive rise in PaCO₂ (and etCO₂) and fall in SPO₂
 - A lowered carbon dioxide (CO₂) drive
 - Blunting of chemoreceptor response to oxygen and CO₂
 - Prolonged exhalation
 - Suppression of depth of respirations
 - Impaired gas exchange
 - Supplemental O₂ in COPD causes increased CO₂ retention

Sedation is the most important predictor of respiratory depression in patients receiving IV opioids – a fact that only 22% of physicians, pharmacists, and nurses knew

Grissinger M. Pa Patient Saf Advis. 2013;10(1):19-26

Incidence of Somnolence/Sedation per Package Insert

Drug Class	Medication	Percentage of patients experiencing somnolence or sedation
Hypnotic Agents	Zolpidem (Ambien®)	2-15
	Trazodone (Desyrel®)	24-46
Antihistamines	Diphenhydramine (Benadryl®)	10-25
Antiemetics	Prochlorperazine (Compazine®)	Specific percentage not reported; drowsiness reported as a common side effect
	Promethazine (Phenergan®)	Specific percentage not reported; respiratory depression reported in the pediatric population
	Metoclopramide (Reglan®)	2-10
Benzodiazepines	Alprazolam (Xanax®)	23-76.8
	Clonazepam (Klonopin®)	25-50
	Diazepam (Valium®)	9
	Lorazepam (Ativan®)	Specific percentage not reported; sedation and respiratory depression at high doses
	Temazepam (Restoril®)	9
Muscle Relaxants	Baclofen (Lioresal®)	10-63
	Cyclobenzaprine (Flexeril®)	39
	Methocarbamol (Robaxin®)	Specific percentages not reported; drowsiness, dizziness, lightheadedness reported as common
Other	Hydroxyzine (Vistaril®)	Specific percentage not reported; drowsiness, sleepiness, and respiratory depression has been reported
	Gabapentin (Neurontin®)	4.5-21.4

- A System's Approach to Safety: Actions Suggested by The Joint Commission
- Effective processes
 - Safe technology
 - Appropriate education and training
 - Effective tools

- Effective Processes
- Policies and procedures for ongoing clinical monitoring of patients receiving opioid therapy
 - Serial assessments:
 - Quality and adequacy of respiration
 - Depth of sedation
 - Perform sedation and respiratory assessment before rousing the patient
 - Reinforce teaching; instruct family and visitors to NOT assist patient with IV PCA
 - Individualize monitoring according to patient response
 - Pulse oximetry useful to monitor oxygenation.
 - Capnography useful to monitor ventilation
 - Pulse oximetry and capnography when used should be **continuous**.

Effective Processes

- Policies and procedures that allow for a 2nd level review by a pain management specialist or pharmacist, would included high-risk opioids (e.g. methadone, fentanyl, meperidine, and IV hydromorphone)

- Policies and procedures for tracking and analyzing opioid-related incidents for quality improvement purposes.

Safe Technology

- Use information technology to monitor prescribing of opioids
 - Red flags/alerts in e-prescribing systems for all opioids.
 - Separate LASA opioids and use tall man lettering
 - Conversion support systems to calculate correct doses of opioids to help prevent problems with conversions from oral, IV and transdermal routes
 - PCA to reduce the risk of over sedation; use smart infusion pumps with dosage error reduction software

Appropriate Education and Training

- Advise to use both pharmacologic and non-pharmacologic alternatives
- Educate and assess understanding of:
 - Potential effect of opioid therapy on sedation and respiratory depression
 - Difference between ventilation and oxygenation
- Emphasis on how to assess patients for ADRs, how to recognize advancing sedation, and importance of making timely adjustments to plan of care
- Patient and caregiver education (verbal and written)

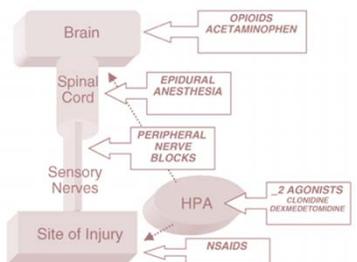
Effective Tools

- Standard tools to screen for risks
 - Oversedation and respiratory depression
 - Pasero Opioid-Induced Sedation Scale (POSS)
 - Richmond Agitation-Sedation Scale (RASS)
 - Misuse of opioids
 - Screener and Opioids Assessment for Patients with Pain (SOAPP)
 - Opioid Risk tool (ORT)
 - Screening Instrument for Substance Abuse Potential (SISAP)

Factors and activities to avoid accidental opioid overdose

- Screen patients for respiratory depression risk factors
- Assess the patient's history of analgesic use to identify potential opioid tolerance or intolerance
- Conduct a full body skin assessment to look for fentanyl patches or implanted drug delivery systems/infusion pumps
- Take extra precautions in patients new to opioids and those on other CNS depressants
- Consult a pharmacist or pain management expert for conversions
- Avoid rapid dose escalation in opioid-tolerant patients
- Take extra precautions at care transitions
- Avoid using opioids to meet an arbitrary pain rating or planned discharge date!!
- Use multimodal analgesia

Use a Balanced, Rationale, Multimodal Approach



Although analgesics techniques are the mainstay, cognitive and physical strategies are essential

Anand et al Contemporary Critical Care 2005;2(11):1-10.

Multimodal Analgesia

□ May consist of opioids with nonopioids along with regional anesthesia

□ Benefits of MMT

- Additive effects of classes of agents with different MOAs
- Improved pain relief with reduced side effects
- Opioid sparing (30%–50%)
- Continuous coverage with less sedation
- Improved patient outcomes through facilitated rehabilitation (mobilization) and recovery efforts; may allow earlier discharge

□ Potential drawbacks

- Some techniques are labor-intensive
- Side effects including dizziness, fatigue, headaches, renal failure, bleeding or ulcers in the digestive tract

Crews JC. 2002;5:629-632.
Raffa RB, Pergolizzi JV, Tallarida RJ. J of Pain 2010;11(8):701-709.

Pain Management Principles When Addiction is Present

- Single prescriber
- PO route preferred, limit use of short-acting PRN formulations
- When needed, IV PCA is appropriate
- Anticipate tolerance and need for higher than average opioid doses
- Understand opioids are less effective and may increase pain (opioid induced hyperalgesia)
- Explore options for regional & non-opioid alternatives
- Team approach and communication of appropriate goals and plan is essential

Perioperative Management

□ Preop

- Gabapentin 600mg
- Acetaminophen 1000mg
- Celecoxib 400mg
- Methadone 80mg

□ Intraop

- Ketamine
- Midazolam
- Remifentanyl
- Hydromorphone

□ Postop

- IV PCA X 24hrs lorazepam sparingly
- Methadone 80mg daily
- Gabapentin 600mg TID
- Acetaminophen 1000mg QID
- Hydromorphone 4-8mg PRN every 3 hr
- DC Orders
 - Taper over 2-3 weeks
 - How and Who

SAFE USE OF OPIOIDS:
COMPLEX CASES



Case

- A 34 year old Iraq war veteran recently diagnosed with Acute Lymphoblast Leukemia is hospitalized for neutropenia and increased pain. He has GVHD after stem cell transplant, with skin, respiratory and gi involvement. When hospitalized, he asks for IV hydromorphone despite being able to swallow. He asks the nurse to give it in the closest port and to inject it rapidly. He also requests diphenhydramine to reduce pruritus.

Case

- A 63 year old engineer undergoing chemo/radiation for head and neck cancer is hospitalized for pain, placement of g-tube. Morphine 10 IV every 2 hours is ineffective in relieving pain; the patient reports minimal relief and no sedation is observed. An increase to 15 mg provides little additional relief. He demands additional increases.

Case

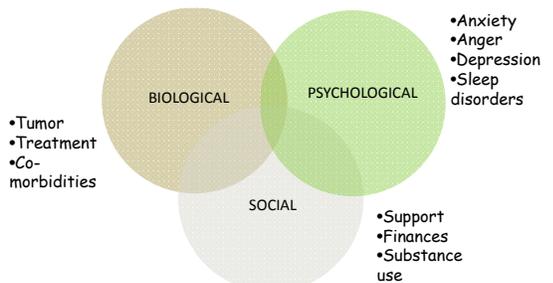
- An 82 year old artist with a known history of colorectal cancer presents to the hospital for confusion. He has been taking morphine extended release 60 mg q 12 hours and morphine ir 15 mg every 3 hours around the clock for visceral pain.

Differential Diagnosis of Aberrant Drug-Taking Behavior

- Addiction
- Pseudo-addiction (inadequate analgesia)
- Other psychiatric disorders
 - Chemical coping
 - Mood disorders (anxiety, depression)
 - Encephalopathy
 - Borderline personality disorder
- Inability to follow a treatment plan (low literacy)
- Criminal Intent

Adapted from Passik SD, Kirsh KL, and Portenoy RK. Pain and Addictive Disease. In: von Roenn JH, Paice JA, Preodor ME, editors. Current Diagnosis and Treatment of Pain. New York: Lange Medical Books, 2006: 78.

Biopsychosocial Model of Pain



Keefe F, et al., Pain 2003;103(1-2):157-62

Strategies to Address Opioid Abuse

- Thorough assessment
 - Pain
 - Risk factors for abuse
- Universal precautions
 - Agreements
 - Urine toxicology
 - Use of prescription monitoring programs
 - Education!



OPIOID RISK TOOL

	Max risk for the patient	Max Score Possible	Max Value
1. Family History of Substance Abuse	Alcohol [] [] []	3	3
	Illegal Drugs [] [] []	3	3
	Prescription Drugs [] [] []	4	4
2. Personal History of Substance Abuse	Alcohol [] [] []	3	3
	Illegal Drugs [] [] []	4	4
	Prescription Drugs [] [] []	5	5
3. Age (Max box if 16-45)	[] []	1	1
4. History of Prepubertal Sexual Abuse	[] []	3	0
5. Psychological Disease	Attention Deficit Disorder [] []	2	2
	Obsessive Compulsive Disorder [] []	2	2
	Bipolar [] []	2	2
	Schizophrenia [] []	2	2
	Depression [] []	1	1
	TOTAL		
	Total Score Risk Category		
	Low Risk 0-3		
	Moderate Risk 4-7		
	High Risk >8		

Reference: Wallace LR. Predicting aberrant behaviors in opioid-treated patients: Preliminary validation of the opioid risk tool. *Drug Alcoholism*. 2013;6(4):241-242. Used with permission.

The CAGE and CAGE-AID Questionnaires

Item	Text
1.	Have you ever felt you ought to cut down on your drinking <i>or drug use</i> ?
2.	Have people annoyed you by criticizing your drinking <i>or drug use</i> ?
3.	Have you ever felt bad or guilty about your drinking <i>or drug use</i> ?
4.	Have you ever had a drink <i>or used drugs</i> first thing in the morning to steady your nerves or to get rid of a hangover?

Note. The plain text shows the CAGE questions. The italicized text was added to produce the CAGE-AID. For this study, the CAGE-AID was preceded by the following instruction: "When thinking about drug use, include illegal drug use and the use of prescription drugs other than as prescribed."

Table from "The prevalence and detection of substance use disorder among inpatients ages 18 to 49: An opportunity for prevention" by Brown RL, Leonard T, Saunders LA, Pappasoulotis O. *Preventive Medicine*, Volume 27, pages 101-110, copyright 1998, Elsevier Science (USA), reproduced with permission from the publisher.

Prescription Painkiller Overdoses in the US

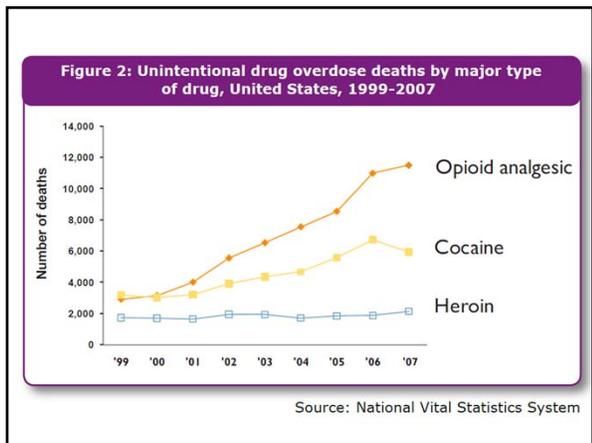
November 2011

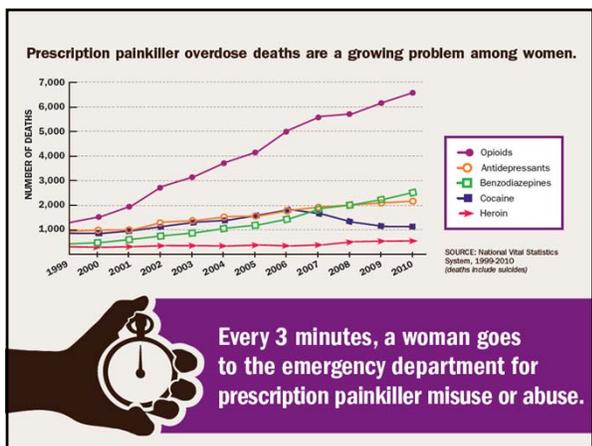


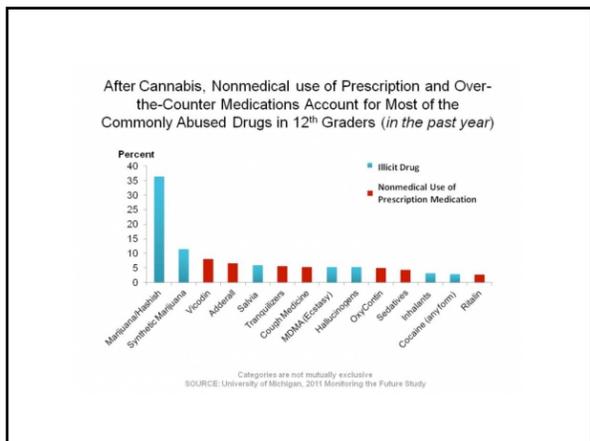

15,000
 Nearly 15,000 people die every year of overdoses involving prescription painkillers.

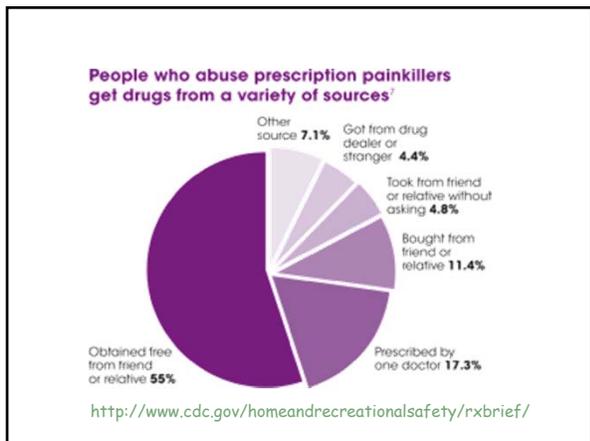
1 in 20
 In 2010, 1 in 20 people in the US (age 12 or older) reported using prescription painkillers for nonmedical reasons in the past year.

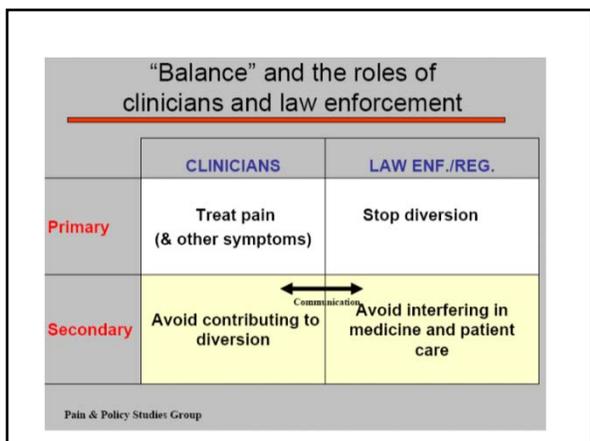
1 Month
 Enough prescription painkillers were prescribed in 2010 to medicate every American adult around-the-clock for a month.











Sources of Diversion

40

- Thefts from pharmacies, drug distribution centers
- Thefts from medicine cabinets**
- Internet
- Smuggling
- Prescriptions from "pill doctors"

Prevent Diversion

- Educate patients/families regarding safe medication practices
 - Don't leave medications out
 - Lock boxes
- Safe disposal
 - Take back programs – pharmacies, police depts
 - Mix drug in wet coffee grounds or kitty litter until dissolved, then dispose in garbage – do not flush down toilet

www.deadiversion.usdoj.gov

Case: Management?

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Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.

Margaret Mead

Questions?