Role of All Practice Providers involved in pain management in the acute-care setting

PAINWeek-End 2018

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Disclosures

- Speakers bureau: Allergan, Amgen & Pernix Pharmaceuticals
- Any unlabeled/unapproved uses of drugs or products referenced will be disclosed.

Objectives

- ✓Discuss importance of managing acute pain.
- ✓Explore the treatment options unique to the acute care setting.
- ✓Evaluate the use of pharmaceuticals & multimodal analgesia.

Hospital Consumer Assessment of Healthcare Providers & Systems (HCAHPS)

- **First** - Comparable data on the patient's perspective on care that allows objective and meaningful comparisons between hospitals.
- **Second** – Designed to create incentives for hospitals to improve their quality of care.
- **Third** - Enhance public accountability in health care by increasing the transparency of the quality of hospital care provided.

http://www.americangovernance.com/americangovernance/webinar/policy/pdf/final_rule_vbp_regulatory_advisory.pdf

https://youtu.be/jjCu4nxOHlQ

JCAHO Pain Standards 2001

- Pain is considered the "fifth" vital sign.
- **Awareness** the right of patients to appropriate assessment and management of their pain.
- **Assess pain in all patients.**
- **Facilitates regular reassessment & follow up**.
- **Educate** providers in pain assessment and management.
- **Determine competency** in pain assessment and management during the orientation of all new clinical staff.
- **Establish policies and procedures that support appropriate prescription or ordering pain medications.**

JCAHO Pain Standards: January 1, 2018

Pain assessment and management standards for hospitals:

- Identify pain assessment & pain management, including safe opioid prescribing, as an organizational priority.

- Highlights: The hospital…
  - Nonpharmacologic pain treatment modalities
  - Pain management strategies reflect a patient-centered approach.
  - Educates the patient & family on discharge plans related to pain management including the following:

✓ Pain management plan of care

✓ Side effects & medication safety

https://www.jointcommission.org/standards_information/r3_report.aspx

Perioperative Surgical Home (PSH)

- Care model applying a standardized multidisciplinary approach to patient care using evidence-based medicine to modify & improve protocols.
- Spans the entire experience from decision of the need for any invasive procedure - acute care period - to discharge from the acute-care facility and beyond.
- Aim is to provide greater integration and alignment of care, to deliver an enhanced surgical experience, recovery & outcomes.
- Improve outcomes & reduce cost.

Surgical Pain

- 48 million inpatient surgeries
- 48.3 million outpatient surgeries
- > 80% report postoperative pain, fewer than half of reported adequate pain relief.

(National Center for Health Statistics, 2009)
(https://www.cdc.gov/nchs/data/nhsr/nhsr102.pdf, 2010)
(Apfelbaum, 2003)

Other Acute Hospital Pain

- 40% of over 100 million ED visits annually for acute pain. (Pletcher et al. 2008)
- Pain was the most commonly reported reason for unanticipated admission or readmission. (Coley et al. 2002)
- Pain continues to be a prevalent problem for medical inpatients: ICU/CCU, oncology, transplant, psychiatry, infusion centers . . . (Helfand et al. 2009; Azzam et al. 2013; Kohler et al. 2016)

Deleterious Effects …

- **Cardio**: HR, PVR, MAP = > MI, arrhythmia
- **Pulmonary**: Splinting, cough, shallow breathing = > atelectasis, V/Q Mismatch, infection
- **GI**: reduced motility = > ileus, nausea/vomiting
- **Renal**: oliguria, urinary retention
- **Coagulation**: PLT aggregation, venostasis = > DVT/PE
- **Immune**: impaired = > infection
- **Muscle**: weakness, atrophy, fatigue
- **Psychological**: anxiety, fear, depression, satisfaction
- **IMPARED SLEEP**
- **Overall**: Delayed recovery, slower return of function, reduced QOL, delayed discharge, increased cost, possible development of persistent pain.

Goals of Pain Management - Acute Care Setting

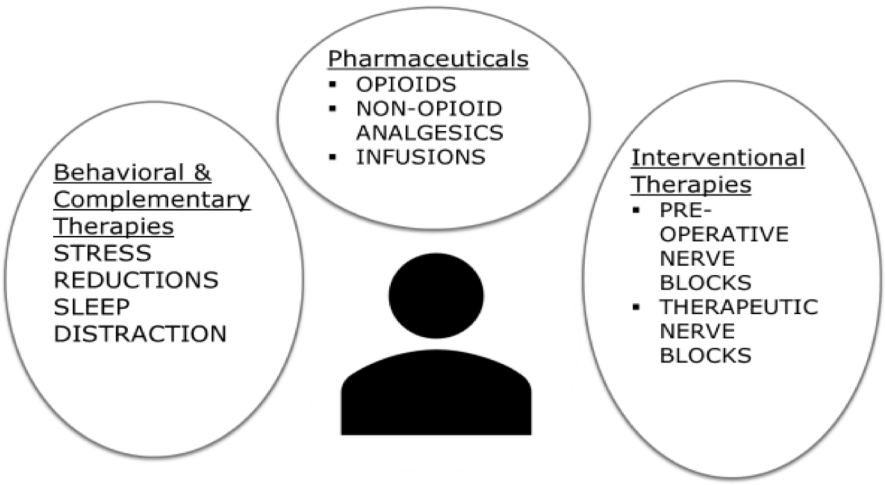
- Identify & address the cause of pain.
- Treat acute pain aggressively; reduce incidence of chronic pain.
- Maintain alertness and function; minimize SE.
- Expedite discharge.
- Excellent communication.
- Improve outcomes
- Cost effective therapy
- Facilitate recovery/rehabilitation
- Eliminate subjective discomfort

  Sensory & affective components of pain

PRE-EMPTIVE ANALGESIA

- Effective pre-emptive analgesic
  - ↓nociceptor activation
  - ↓activity of pain neurotransmitters
- Examples
  - local wound infiltration
  - regional anesthesia
  - pharmacotherapy & physiological preparation
- Studies show, patients receiving pre-emptive analgesia report lower pain scores and utilize less opioids.

Multimodal Analgesia



Multimodal Analgesia: PCA basics

Why, what drug, what dose, how often, loading?, basal?

- Morphine 0.5mg q10 minutes
- Hydromorphone 0.2-0.4mg q10 minutes; 0.4-0.6mg
- Fentanyl 12.5-25mcg q10 minutes

Multimodal Analgesia: Opioid basics

- Oral, IM, IV, epidural, intrathecal
- Immediate release opioids
- Sustained release opioids (8hr versus 12hr)
- Partial mu agonists (buprenorphine; mcg versus mg)
- Opioids w/mixed mechanisms of action (weak mu agonist w/SNRI)

Multimodal Analgesia: Non-opioids

- Acetaminophen PO IV
- NSAIDs: Celecoxib, ketorolac, ibuprofen
- Anticonvulsants: gabapentin, pregabalin, topiramate, trileptal
- Antidepressants (SNRI, TCA): duloxetine, desipramine, nortriptyline

Multimodal Analgesia: Infusions

- IV lidocaine
- IV ketamine
- V magnesium
- IV dihydroergotamine (DHE)

Multimodal Analgesia: Regional

Neuraxial anesthesia

- Epidural (thoracic, lumbar)
- Intra-spinal

Peripheral neural blockade (depending upon surgery)

- Paravertebral NB
- Infraclavicular NB
- Femoral NB
- Popliteal NB

Epidural Local Anesthetic & Orthopedic Surgery

↓ DVT incidence (31%) in patients receiving epidural vs. general anesthetic.

Reduction in intraoperative blood loss (29%).

Better pain relief at rest & with mobilization following total knee replacement.

Suppression of surgical stress response.

Decrease length of hospitalization.

(Scott & Kehlet 1988; Sorenson & Pace 1992; Moiniche et al. 1994)

Epidural or Spinal Analgesia with Local Anesthetics

Peri-operative parameter	Effect	Magnitude
Blood loss or transfusion requirements	↓	20-30%
Pulmonary complications (infection, embolism)	↓	30-40%
Other thromboembolic complications	↓	40-50%
Ileus	↓	2 days
Myocardial infarction	↓	30%

(Kehlet & Mogensen 1999; Joshi et al. 2008; Nguyen-Lu et al. 2016)

Regional Anesthesia Techniques for Acute Pain

Neuraxial Blockade – Single vs. Continuous

- Epidural
- Subarachnoid/Spinal
- Location is key (Lumbar epidurals limit walking)

Peripheral Nerve Block – Single vs. Continuous

- No hypotension
- Weakness can be variable depending on local anesthetic

Local Infiltration/Intra-articular

http://ether.stanford.edu/policies/Anticoagulation_Guidelines_Neuraxial_Procedures.html

ANTICOAGULATION GUIDELINES FOR NEURAXIAL PROCEDURES

Guidelines to Minimize Risk Spinal Hematoma with Neuraxial Procedures

STANFORD SCHOOL OF MEDICINE

	Minimum time between last dose of anticoagulant & spinal injection or catheter placement * longer in CRI/AKI	Use of Antithrombotic Agents in Patients with Indwelling Neuraxial Catheters	Minimum time between spinal injection or catheter removal & next dose of anticoagulant
TRADITIONAL ANTICOAGULANTS			
Warfarin	when INR < 1.5	CONTRAINDICATED	2 hours
Heparin full dose IV	when aPTT < 40. Check after holding 2 hours	Indwelling catheter OK	1 hour
Heparin minidose (5000 Units) SQ BID	No contraindication		
Heparin minidose (5000 Units) SQ TID	when aPTT < 40 or 6 hours after last dose		
Heparin full dose (>5000 Units) SQ bid or TID	when aPTT <40 or 6 hours after last dose		
Fondaparinux (Arixtra) <2.5mg SQ qd (prophylaxis)	36-42 hours	CONTRAINDICATED	6-12 hours
Fondaparinux (*Arixtra*) 5-10mg SQ qd (full dose)	Contraindicated		
Enoxaparin (*Lovenox*) 1mg/kg SQ bid; 1.5mg/kg SQ qd (full dose)	24 hours*		24 hours
Enoxaparin (*Lovenox*) 40mg SQ qd (prophylaxis)	12 hours*		6-8 hours
DIRECT THROMBIN INHIBITORS			
Argatroban	unknown orwhen DTI assay < 40 or aPTT < 40	CONTRAINDICATED while catheter in place	unknown
Bivalirudin (*Angiomax*)			
Lepirudin (*Refludan*)			
Dabigatran (Pradaxa)	7 days		
ORAL ANTIPLATELET AGENTS			
Aspirin/NSAIDS	May be given, No time restrictions		
Clopidogrel (Plavix) Prasugrel (Effient)	7 days	CONTRAINDICATED while catheter in place	2 hours
Ticlopidine (Ticlid)	14 days		
GP IIB/IIA INHIBITORS			
Abxicimab (*Reopro*)	48 hours	CONTRAINDICATED while catheter in place	2 hours
Eptifibatide (*Integrilin*)	8 hours*		
Tirofiban (Aggrastat)	8 hours*		
THROMBOLYTIC AGENTS			
Alteplase (TPA) Full dose for stroke, MI, etc	10 days	CONTRAINDICATED while catheter in place	10 days
Alteplase (TPA) 2mg dose for catheter clearance	May be given, No time restrictions (maximum dose 4mg/24 hrs)		
NEW AGENTS			
Apixaban (Eliquis)	unknown for neuraxial procedures but hold 48 hours for surgery		

Date 3/28/2013

ASRA COAGS REGIONAL

ASRA COAGS PAIN

https://www.asra.com/page/150/asra-apps

Multimodal Analgesia: Behavioral

- Relaxation
- Meditation
- Distraction
- Coaching
- PT/OT

Inadequate pain relief occurs secondary to multiple factors:

- Insufficient knowledge of the care providers
- In adequate patient preparation
- Fear of medication side effects

Optimal management of postoperative pain requires an understanding of:

- Pathophysiology of pain
- Methods used for assessment of pain
- Awareness of the various options available for pain control

General Principles: Pre-operatively

- History of poorly managed surgical pain
- On chronic opioid therapy
- High risk of surgical nerve damage/compromise (thoracotomy/amputation)
- History chronic pain
- Significant anxiety over post-surgical pain
- Other risk factors …

Risk Factors for Post-operative Pain

- Pain, moderate to severe, lasting more than 1 month
- Repeat surgery
- Catastrophizing, Anxiety, Depression
- Female gender, Younger age (adults)
- Workers' compensation
- Genetic predisposition
- Radiation therapy, Neurotoxic chemotherapy

Adapted from Macintyre PE, Scott DA, Schug SA, et al. Acute pain management: scientific evidence [Systematic reviews and meta-analyses]. 3rd edition. 2010

Incidence of and Risk Factors for Chronic Opioid Use Among Opioid-Naive Patients in the Postoperative Period

JAMA Intern Med. 2016;176(9):1286-1293.
Eric Sun, MD, et al.

Retrospective analysis of administrative health claims to determine the association between **chronic opioid use & surgery** among privately insured patients between January 1, 2001, and December 31, 2013.

Surgeries associated with increased risk of chronic opioid use:

- total knee arthroplasty
- total hip arthroplasty
- laparoscopic (open) cholecystectomy
- open appendectomy
- cesarean delivery
- simple mastectomy

- Male sex
- Age older than 50 years
- Preoperative history of drug abuse, alcohol abuse, depression, benzodiazepine use, or antidepressant use

General Principles: Pre-operatively

- Consider preemptive analgesia
  - Medications, multimodal
  - Regional anesthesia techniques
- Setting expectations
- Detailed history of all non-opioid analgesics used, anxiolytics, cannabinoids, illicit substances, alcohol, muscle relaxants, etc.
- Treat aggressively during hospital course
- Discharge planning

General Principles: Acute Hospitalization

Multimodal analgesia

- IV Lidocaine:
  - anti-inflammatory
  - anti-hyperalgesic
  - gastrointestional pro-peristaltic
  - sodium channel modulator (Eipe et al. 2016)
- PCA (principles dose stacking, safety, patient control).
- Non-opioid analgesics (NSAIDs, acetaminophen, antiepileptics, SNRIs)
- Ketamine (oral/IV)

General Principles: SHC Existing Chronic Pain

Give a Gabapentinoid:

- gabapentin 1200 mg two hours pre-incision. 400-600 mg three times a day for 14 days postoperatively.
- pregabalin (Lyrica) 300 mg two hours pre-incision. 150 mg twice a day for 14 days following surgery.

General Principles: SHC Existing Chronic Pain

Non-opioid Analgesics:

- acetaminophen 1000 mg by mouth the AM of surgery, and every 8 hours after surgery.
- Vitamin C 500-1000 mg for forty days starting the AM of surgery.
- venlafaxine 37.5mg of extended release starting the day before surgery and continuing for 10 to 14 days following surgery.

General Principles: SHC Existing Chronic Pain

Opioids:

- Continue current long acting opioids unchanged including the morning of surgery to prevent peri-operative withdrawal.
- May need to increase these 25-50% and supplement with a short acting such as oxycodone 5-10 mg every 2 hours as needed after surgery.

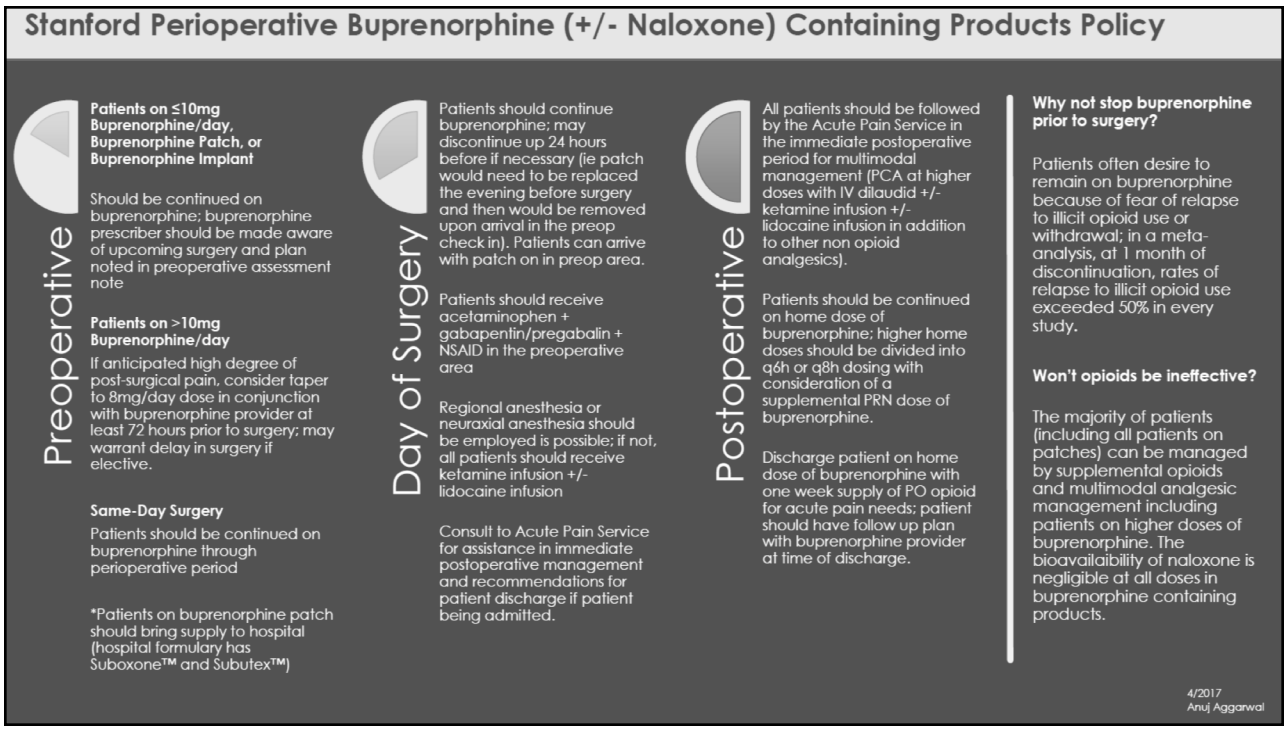
General Principles: SHC Existing Chronic Pain

methadone:

Make sure they continue to get their daily dose but don't increase their daily methadone dose without expert consultation. These patients have up to a 40% chance of developing significant postoperative sedation or respiratory depression so monitor appropriately and consider an inpatient pain consult.

buprenorphine (Suboxone/Subutex/buprenorphine):

Continues to be an ongoing debate.



General Principles: SHC Existing Chronic Pain

Regional anesthesia:

Where possible (continuous catheter technique would be preferable if possible)

Intrathecal space
Epidural space
UE regional block
LE regional blocks
Paraverterbral space
Transverse abdominis plane (TAP)

General Principles: SHC Existing Chronic Pain

Infusions:

IV ketamine - Pre-incision intravenous bolus 0.5 mg/ kg followed by intravenous infusion 0.25 mg/kg /hour.

IV lidocaine – Pre-incision intravenous bolus 1.5 mg/ kg followed by intravenous infusion 1-1.5 mg/kg /hour.

Wound Infiltration: COMMUNICATION IMPERATIVE WITH ALL CARE PROVIDERS TO REDUCE INCIDENCE OF LOCAL ANEHSTIC TOXICITY.

- Infiltrate ropivacaine 0.75% 20 mL in the wound.
- Liposomal bupivacaine (Exparel)
- Apply 20 g of EMLA cream around the site of the wound preoperatively 5 min. before surgery and daily for the first four days following surgery.

General Principles: Peri-operatively

Preoperatively

Cyclooxygenase-2-selective (e.g. Celecoxib 400 mg)

Oral lorazepam or clonidine for anxiety. (Blaudszun et al. 2012)

Intraoperatively

IV Magnesium 40-50mg/kg – single dose. (Albrecht et al. 2013)

IV dexamethasone at induction, 8mg – single dose. (Waldron et al. 2013)

Dexmedetomidine (Precedex): IV, IT

IV 0.2-1.4 mcg/kg/hr. – titrating to effect. (Li, et al. 2016; Mohamed, et al. 2016)

CLINICAL PATHWAYS (extension PSH)

- Coordination of care
- Expedites care
- Reduces decision making
- Requires input from all parties involved

✓ surgeons
✓ anesthesia
✓ regional proceduralist
✓ medicine/nursing

Best Practice & Research Clinical Anaesthesiology 28 (2014) 59–79

Colorectal Surgery		Thoracic epidural (intrathecal morphine/lidocaine infusion/TAP block), dexamethasone, ketamine magnesium, acetaminophen & NSAIDS/COX-2 selective	Epidural Acetaminophen NSAIDs IV-PCA
Hernia Surgery	Gabapentinoids	PVB, wound infiltration, acetaminophen & NSAIDS/COX-2 selective	Acetaminophen NSAIDs/COX-2 selective IV-PCA or PO opioid
Total Knee Arthroplasty	Gabapentinoids	Epidural (intrathecal morphine/lidocaine infusion/ACC/Femoral block), ketamine, acetaminophen & NSAIDS/COX-2 selective	Epidural (adductor canal catheters) Acetaminophen NSAIDs/COX-2 selective Ketamine Gabapentinoids IV-PCA or PO opioids
Spine Surgery	Gabapentinoids	Epidural (intrathecal morphine), lidocaine infusion, ketamine, acetaminophen & NSAIDS/COX-2 selective	Epidural Acetaminophen NSAIDs/COX-2 selective Ketamine Gabapentinoids IV-PCA or PO opioids
Consider for all other Surgeries	Gabapentinoids	Lidocaine infusion, dexamethasone, ketamine magnesium, incisional infiltration, α2 agonists, acetaminophen & NSAIDS/COX-2 selective	Acetaminophen NSAIDs/COX-2 selective Gabapentinoids IV-PCA or PO opioids

Example Total Hip Arthroplasty 2014
Pre-operative Holding Area
Acetaminophen 1000 mg oral Oxycodone SR 10-20 mg oral Gabapentin 300-600 mg oral Celecoxib 200-400 mg oral (alt etodolac 500 mg)
Intra-operative Area
Spinal anesthetic: 1.4-1.6 mg 0.75% bupivacaine + fentanyl 25 mcg **Per-articular injection:** epinephrine 1 mg/ml (0.5 ml), ketorolac 30 mg/ml (1 ml), clonidine 100 mcg/ml (0.8 ml), ropivacaine 5 mg/ml (49.35 ml), sodium chloride 0.9% (48.45 ml) Ketorolac 15 mg IV – **at the end of the case**
PACU
Oxycodone 5-10 mg q4hr PRN
PAIN WEEK

Example Total Hip Arthroplasty 2014
Postoperative
Acetaminophen 1000 mg orally q8hr Oxycodone SR 10-20 mg orally q12hr Gabapentin 300 mg qhs Tramadol 50 mg orally q6hr PRN Ketorolac 7.5 mg IV q6hr X2 doses, starting 6hr after surgery Oxycodone 5-10-15 mg PRN (mild-moderate-severe pain) Hydromorphone 0.2-0.4 mg IV q2hr PRN breakthrough pain
PAIN WEEK

Other potential target populations?

- Major abdominal surgery
  - Epidural, multimodal medications, early mobility
- Breast surgery
  - Paravetebral, multimodal medications, emotional support
- Major trauma
  - Multimodal medications, emotional support, regional catheter
- Pathway for patients' at high risk {high-intensity post-surgical pain, existing chronic pain, opioid tolerant/addiction history}
- In the ED

Multimodal Analgesia: Carmichael et al. 2013

A prospective randomized controlled trial: perioperative regimen of pregabalin & celecoxib reduces pain scores & improve physical function after total hip arthroplasty.

80 patients

All pregabalin & celecoxib 2h before surgery

Pregabalin 75 mg BID & celecoxib 100 mg BID for 14 days before surgery & 3 weeks after	Standard care (placebo)

- Lower pain scores prior to surgery
- More manageable pain in the hospital
- Quicker return of functioning at discharge

Multimodal Analgesia: Mathiesen et al. 2013

Complex multilevel spine fusion:

85 patients

Less opioids
Earlier mobilization & ambulation
Less nausea, sedation, dizziness
Less PACU LOS (270 vs 345 min)
Discharge (7 vs 9 days)

Acetaminophen NSAIDs Gabapentin S-ketamine Dexamethasone Ondansetron Epidural infusion (local anesthetic)	PCA w/morphine

General Principles: Acute Hospitalization

Why is it important?

↓ cost, ↓ suffering, ↓ morbidity, ↑ patient satisfaction

How best is pain managed?

- Identifying patients at risk for prolonged hospital course (co-morbid medical history, poor coping skills, catastrophizing, etc.).
- Incorporating behavioral management/setting expectations.
- Interdisciplinary care/coordinated care among disciplines.
- Family/team meetings.
- Multimodal analgesia.

General Principles: Acute Hospitalization

Discharge Planning

- At time of pre-surgical planning
- Pre-anesthesia visit
- Social work involved early
- Try discharge during week day

- Communication at discharge
  - Expected course
  - Follow up
  - Medications going home with (particularly new medications & opioids)

2016 CDC Guidelines Safe Opioid Prescribing

- Consider alternative options first
- Opioids when other options fail
- Start lowest effective dose for shortest duration
- Implementing pain treatment agreements
- Importance of monitoring (UDT, state PDMP)
- Encouraging manufactures to design abuse deterrent products

https://www.federalregister.gov/articles/2015/12/14/2015-31375/proposed-2016-guideline-for-prescribing-opioids-for-chronic-pain

Summary

Summary

- Importance & challenge of pain management in the acute care setting
- Options unique to the acute care/hospital setting
- Use of pharmaceuticals & multimodal analgesia
- Setting patient expectations and early discharge planning
- Identifying patients at risk for poor outcomes & modifications in management

THANK YOU

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