

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

PAINWeek-End 2018

Theresa Mallick-Searle, MS, ANP-BC
Stanford Health Care, Division Pain Medicine
Tmallick@stanfordhealthcare.org

 <https://www.linkedin.com/in/theresa-mallick-searle>
 @tmallic

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.

Condition of the times

- Why is this lecture being presented at PWEnd 2018?
- Why is it a timely topic in pain management?
- What are the three key take a ways today:
 - Not all post-op patients are created equal
 - The peri-operative surgical home
 - Multimodal analgesia in the acute care setting

Pain Classification

Acute	<ul style="list-style-type: none"> ▪ Short duration ▪ Recent onset ▪ Transient ▪ Protective ▪ Known causality
Chronic/Persistent	<ul style="list-style-type: none"> ▪ Duration > 3 months ▪ Persistent or recurrent ▪ Outlasts protective benefit ▪ Unknown causality ▪ Associated with co-morbidities
Breakthrough/Flare	<ul style="list-style-type: none"> ▪ Unpredictable ▪ Fear association ▪ Multi-causality

Pain Characteristics

Nociceptive Pain	<ul style="list-style-type: none"> ▪ Normal processing of stimuli that damages normal tissues ▪ Responds to opioids
➤ Somatic	<ul style="list-style-type: none"> ▪ Pain arises from bone, joint, muscle, skin or connective tissue ▪ Aching, throbbing ▪ Localized
➤ Visceral	<ul style="list-style-type: none"> ▪ Organs ▪ Deep ▪ Not well localized

Pain Characteristics

Neuropathic Pain	<ul style="list-style-type: none"> ▪ Abnormal processing of sensory input by PNS or CNS ▪ Less responsive to opioids
➤ Centrally generated	<ul style="list-style-type: none"> ▪ Deafferent pain: injury to PNS or CNS (phantom limb) ▪ Sympathetically maintained pain: dysregulation of autonomic nervous system (CRPS)
➤ Peripherally generated	<ul style="list-style-type: none"> ▪ Polyneuropathies (diabetic neuropathy) ▪ Mononeuropathies (nerve root compression)

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



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.

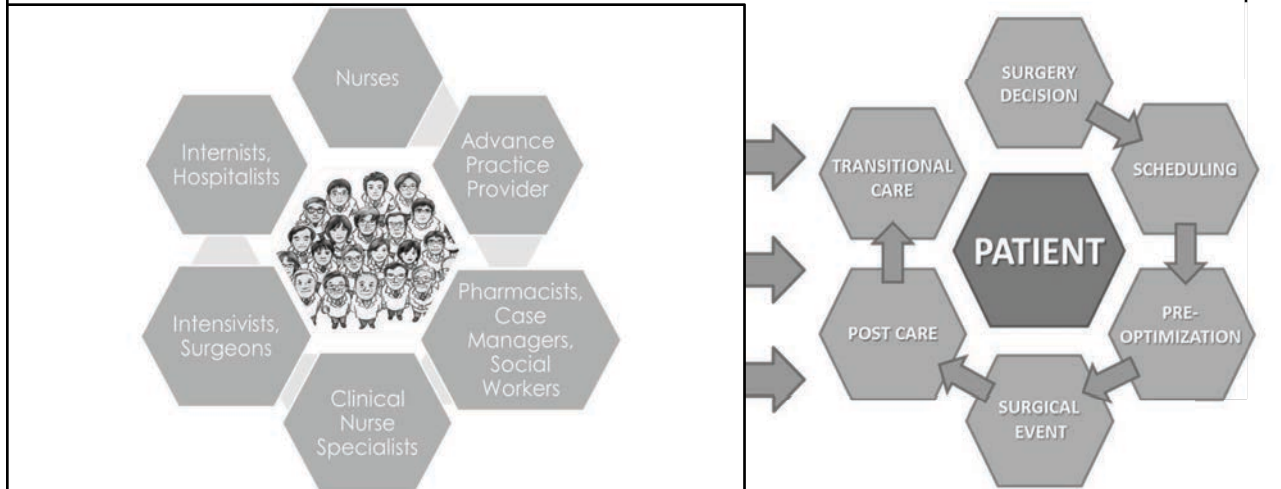
Perioperative Surgical Home (PSH)



Patient-Centered Medical
Home Team

Perioperative Surgical

Home Process



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.

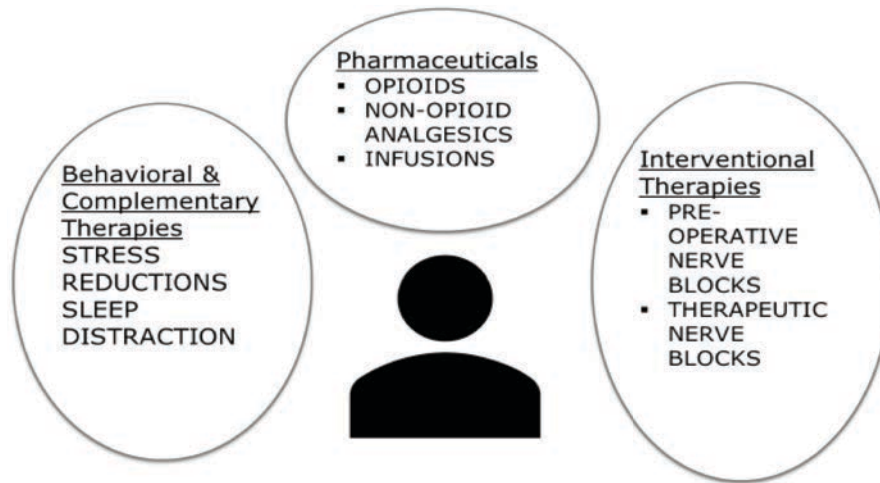
Goals of Pain Management - Acute Care Setting

- | | |
|---|---|
| <ul style="list-style-type: none"> ▪ 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. | <ul style="list-style-type: none"> ▪ Improve outcomes ▪ Cost effective therapy ▪ Facilitate recovery/rehabilitation ▪ Eliminate subjective discomfort <ul style="list-style-type: none"> 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

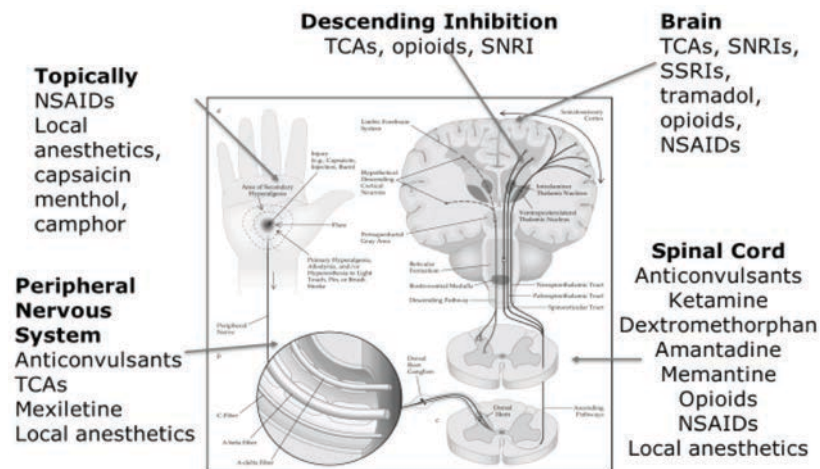
ANTICOAGULATION GUIDELINES FOR NEURAXIAL PROCEDURES <i>Guidelines to Minimize Risk Spinal Hematoma with Neuraxial Procedures</i>			
	Minimum time between last dose of anticoagulant & spinal injection or catheter placement * longer in CTRAD	Use of Antithrombotic Agents in Patients with Indwelling Neuraxial Catheters	Minimum time between spinal injection or catheter removal & next dose of anticoagulant
TRADITIONAL ANTICOAGULANTS			
Warfarin	when aPTT < 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	CONTRAINDICATED	6-12 hours
Fondaparinux (Arista) <2.5mg SQ qd (nonphases)	36-42 hours		
Fondaparinux (Arista) 5-10mg SQ qd (full dose)	Contraindicated		
Enoxaparin (Lovenox) 1mg/kg SQ bid; 1.5mg/kg SQ qd (full dose)	24 hours*		
Enoxaparin (Lovenox) 40mg SQ qd (nonphases)	12 hours*		24 hours
			6-8 hours
DIRECT THROMBIN INHIBITORS			
Argatroban	unknown (when DTI assay < 40 or aPTT < 40)	CONTRAINDICATED while catheter in place	unknown
Bivalirudin (Angiomax)			
Levulin (Bibactin)			
Dabigatran (Pradaxa)	7 days		
ORAL ANTIPLATELET AGENTS			
Aspirin/ASA	May be given. No time restrictions		
Clopidogrel (Plavix)	7 days	CONTRAINDICATED while catheter in place	2 hours
Prasugrel (Effient)	14 days		
Ticagrelor (Brilinta)			
GP IIb/IIIa INHIBITORS			
Abciximab (Repro)	48 hours	CONTRAINDICATED while catheter in place	2 hours
Eptifibatide (Integrin)	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



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

Pharmacological Approach to Treatment



Multimodal Analgesia: Behavioral

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

Inadequate pain relief occurs secondary to multiple factors:

- Insufficient knowledge of the care providers
- Inadequate 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-Naïve 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
 - gastrointestinal 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.

Stanford Perioperative Buprenorphine (+/- Naloxone) Containing Products Policy

<p>Preoperative</p> <p>Patients on ≤10mg Buprenorphine/day, Buprenorphine Patch, or Buprenorphine Implant</p> <p>Should be continued on buprenorphine; buprenorphine prescriber should be made aware of upcoming surgery and plan noted in preoperative assessment note</p> <p>Patients on >10mg Buprenorphine/day</p> <p>If anticipated high degree of post-surgical pain, consider taper to 8mg/day dose in conjunction with buprenorphine provider at least 72 hours prior to surgery; may warrant delay in surgery if elective.</p> <p>Same-Day Surgery</p> <p>Patients should be continued on buprenorphine through perioperative period</p> <p><small>*Patients on buprenorphine patch should bring supply to hospital (hospital formulary has Suboxone™ and Subutex™)</small></p>	<p>Day of Surgery</p> <p>Patients should continue buprenorphine; may discontinue up 24 hours before if necessary (ie patch would need to be replaced the evening before surgery and then would be removed upon arrival in the preop check in). Patients can arrive with patch on in preop area.</p> <p>Patients should receive acetaminophen + gabapentin/pregabalin + NSAID in the preoperative area</p> <p>Regional anesthesia or neuraxial anesthesia should be employed if possible; if not, all patients should receive ketamine infusion +/- lidocaine infusion</p> <p>Consult to Acute Pain Service for assistance in immediate postoperative management and recommendations for patient discharge if patient being admitted.</p>	<p>Postoperative</p> <p>All patients should be followed by the Acute Pain Service in the immediate postoperative period for multimodal management (PCA at higher doses with IV dilaudid +/- ketamine infusion +/- lidocaine infusion in addition to other non opioid analgesics).</p> <p>Patients should be continued on home dose of buprenorphine; higher home doses should be divided into q6h or q8h dosing with consideration of a supplemental PRN dose of buprenorphine.</p> <p>Discharge patient on home dose of buprenorphine with one week supply of PO opioid for acute pain needs; patient should have follow up plan with buprenorphine provider at time of discharge.</p>	<p>Why not stop buprenorphine prior to surgery?</p> <p>Patients often desire to remain on buprenorphine because of fear of relapse to illicit opioid use or withdrawal; in a meta-analysis, at 1 month of discontinuation, rates of relapse to illicit opioid use exceeded 50% in every study.</p> <p>Won't opioids be ineffective?</p> <p>The majority of patients (including all patients on patches) can be managed by supplemental opioids and multimodal analgesic management including patients on higher doses of buprenorphine. The bioavailability of naloxone is negligible at all doses in buprenorphine containing products.</p>
---	---	--	--

4/2017
Anuj Aggarwal

General Principles: SHC Existing Chronic Pain

Regional anesthesia:

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

Intrathecal space

Paravertebral space

Epidural space

Transverse abdominis plane (TAP)

UE regional block

LE regional blocks

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 ANESTHETIC 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, α_2 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

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

- **Foot/Ankle**
 - Popliteal catheter and single shot saphenous
 - PCA, short acting opioid (SAO) prn
- **Shoulder/elbow**
 - Interscalene or other brachial plexus catheter
 - PCA, SAO prn
- **Complex spine**
 - Surgeon placed epidural with mostly local anesthetic
 - PCA, SAO prn

Other potential target populations?

- **Major abdominal surgery**
 - Epidural, multimodal medications, early mobility
- **Breast surgery**
 - Paravertebral, 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

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

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



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.

Psychological preparation & postoperative outcomes for adults undergoing surgery under general anesthesia.

Cochrane Database Syst Rev. 2016 May 26;(5):CD008646.

Powell R, et al.

- Procedural information, sensory information, relaxation, cognitive intervention, hypnosis and emotion-focused intervention.
- Impact on: pain, behavioral recovery, length of stay & negative affect.
- The evidence suggested that psychological preparation may be beneficial for the outcomes postoperative pain, behavioral recovery, length of stay & is unlikely to be harmful.

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



REFERENCES

1. Albrecht E, Kirkham KR, Liu SS, et al. Peri-operative intravenous administration of magnesium sulfate and postoperative pain: a meta-analysis. *Anesthesiology* 2013;68:79-90.
2. Apfelbaum JL, Chen C, Mehta SS, Gan TJ. Postoperative pain experience: results from a national survey suggest postoperative pain continues to be unmanaged. *Anesth Analg* 2003;97:534-40.
3. Azzam PN, Alam A. Pain in the ICU: a psychiatric perspective. *J Intensive Care Med*. 2013 May-Jun;28(3):140-50
4. Benhamou D, Berti M, Brodner G, et al. Postoperative Analgesic Therapy Observational Survey (PATHOS): a practice pattern study in 7 central/southern European countries. *Pain* 2008 May;136(1-2):134-41.
5. Blaudszun G, Lysakowski C, Elia N, et al. Effect of perioperative system alpha2 agonists on postoperative morphine consumption and pain intensity: systematic review and meta-analysis of randomized controlled trials. *Anesthesiology* 2012;116:1312-22.

REFERENCES

6. Carmichael NM, Katz J, Clarke H, et al. An intensive perioperative regimen of pregabalin and celecoxib reduces pain and improves physical function scores six weeks after total hip arthroplasty: a prospective randomized controlled trial. *Pain Res Manag*. 2013 May-Jun;18(3):127-32.
7. Coley KC, Williams BA, DaPos SV, et al. Retrospective evaluation of unanticipated admission and readmissions after same day surgery and associated costs. *J Clin Anesth* 2002;14(5):349-53.
8. Darnall BD. Pain Psychology and Pain Catastrophizing in the Perioperative Setting: A Review of Impacts, Interventions, and Unmet Needs. *Hand Clin*. 2016 Feb;32(1):33-9.
9. Eipe N, Gupta S, Penning J. Intravenous lidocaine for acute pain: an evidenc-based clinical update. *BJA Education*. First published online: 12 April 2016
10. Garcia RM, Cassinelli EH, Messerschmitt PJ, et al. A multimodal approach for postoperative pain management after lumbar decompression surgery: a prospective, randomized study. *J Spinal Disord Tech*. 2013 Aug;26(6):291-7

REFERENCES

11. Gritsenko K, Khelemsky Y, Kaye AD, et al. Multimodal therapy in perioperative analgesia in *Best Practice & Research Clinical Anesthesiology* 2014;28:59-79.
12. Helfand M, Freeman M. Assessment and management of acute pain in adult medical inpatients: a systematic review. *Pain Med.* 2009 Oct;10(7):1183-99.
13. Ip HY, Abrishami A, Peng PW, et al. Predictors of postoperative pain an analgesic consumption: a qualitative systematic review. *Anesthesiology* 2009;111:657-77.
14. Jena AB, Goldman D, Karaca-Mandic P. Hospital Prescribing of Opioids to Medicare Beneficiaries. *JAMA Intern Med.* 2016 Jun 13. doi: 10.1001/jamainternmed.2016.2737. [Epub ahead of print]
15. Joshi GP, Bonnet F, Shah R, et al. A systematic review of randomized trials evaluating regional techniques for postthoracotomy analgesia. *Anesth Analg.* 2008 Sep;107(3):1026-40.
16. Joshi GP, and Ogunnaike BO. Consequences of inadequate postoperative pain relief and chronic persistent postoperative pain. *Anesthesiol Clin North America* 2005 Mar;23(1):21-36.

REFERENCES

17. Kehlet H and Mogensen T. Hospital stay of 2 days after open sigmoidectomy with a multimodal rehabilitation programme. *Br J Surg.* 1999 Feb;86(2):227-30.
18. Kehlet H, Wilkinson RC, Fischer HB, et al. PROSPECT: evidence-based, procedure-specific postoperative pain management. *Best Pract Res Clin Anaesthesiol* 2007 Mar;21(1):149-59.
19. Kohler M, Chiu F, Gelber KM, et al. Pain management in critically ill patients: a review of multimodal treatment options. *Pain Manag.* 2016 May 18.
20. Li BY, Geng ZY, Wang DX. Effect of dexmedetomidine infusion on postoperative recovery for patients undergoing major spinal surgery during propofol anesthesia. *Beijing Da Xue Xue Bao* 2016 Jun 18;48(3):529-33.
21. Mathiesen O, Dahl B, Thomsen BA, et al. A comprehensive multimodal pain treatment reduces opioid consumption after multilevel spine surgery. *Eur Spine J.* 2013 Sep;22(9):2089-96.
22. Michelson JD, Addante RA, Charlson MD. Multimodal analgesia therapy reduces length of hospitalization in patients undergoing fusions of the ankle and hindfoot. *Foot Ankle Int.* 2013 Nov;34(11):1526-34.

REFERENCES

23. Mohamed SA, El-Rahman AM, Fares KM. Intrathecal dexmedetomidine, ketamine, and their combination added to bupivacaine for postoperative analgesia in major abdominal cancer surgery. *Pain Physician* 2016 Jul;19(6):E829-39.
24. Moiniche S, Hjortso NC, Hansen BL, et al. The effect of balanced analgesia on early convalescence after major orthopaedic surgery. *Acta Anaesthesiol Scand*. 1994 May;38(4):328-35.
25. Nguyen-Lu N, Carvalho JC, Kingdom J, et al. Mode of anesthesia and clinical outcomes of patients undergoing Cesarean delivery for invasive placentation: a retrospective cohort study of 50 consecutive cases. *Can J Anaesth*. 2016 Jul 21. [Epub ahead of print]
26. Pletcher MJ, Kertesz SG, Kohn MA, et al. Trends on opioid prescribing by race/ethnicity for patients seeking care in US emergency departments. *JAMA* 2008;299:70-78.
27. Scott NB and Kehlet H. Regional anaesthesia and surgical morbidity. *Br J Surg*. 1988 Apr;75(4):299-304. Sinatra R. Causes and consequences of inadequate management of acute pain. *Pain Medicine* 2010;11:1859-1871.

REFERENCES

28. Sorenson RM and Pace NL. Anesthetic techniques during surgical repair of femoral neck fractures. A meta-analysis. *Anesthesiology*. 1992 Dec;77(6):1095-104.
29. Sun E, et al. 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.
30. Theunissen M, Peters ML, Bruce J, et al. Preoperative anxiety and catastrophizing: a systematic review and meta-analysis of the association with chronic postsurgical pain. *Clin J Pain* 2012;28(9):819-41.
31. Tumber PS. Optimizing preoperative analgesia for the complex pain patient: medical and interventional strategies. *Can J Anesth* 2014;61:313-140.
32. Villavicencio AT, Nelson EL, Mason A, et al. Preliminary results on feasibility of outpatient instrumented transforaminal lumbar interbody fusion. *J Spinal Disord Tech*. 2013 Aug;26(6):298-304.
33. Waldron NH, Jones CA, Gan TJ, et al. Impact of perioperative dexamethasone on postoperative analgesia and side-effects: systematic review and meta-analysis. *Br J Anaesth* 2013;110:191-200.
34. Warfield CA, Kahn CH. Acute pain management. Programs in U.S. hospitals and experiences and attitudes among U.S. adults. *Anesthesiology* 1995 Nov;83(5):1090-4.