

Welcome!

# Managing Perioperative Pain: Strategies For Success

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# Topics to Be Covered

- ◆ Patient's Rights; Professional Duties
- ◆ Patient's Concerns
- ◆ Professional Concerns
- ◆ Common Barriers to Optimal Pain Control
- ◆ Effective Strategies for Managing Pain
- ◆ Challenge of Chronic Pain in Perioperative Areas

# Financial Disclosures 2008 - 2010

## ◆ Advisory Board Consultation

- Cephalon
- Ortho McNeil

## ◆ Projects receiving unrestricted educational grants

- Ortho-McNeil (PriCara)
- Purdue Pharma LP

## ◆ Other Consulting

- Inflexxion
- American Society for Pain Management Nursing
- American Pain Foundation
- Foundation for Informed Medical Decision Making
- Legal firms

# Pain A Public Health Problem

- ◆ 15% Americans major trauma/surgery pain (45 million)
- ◆ 25% Adults have chronic pain (>76 million)
  - More than diabetes, heart disease & cancer combined
- ◆ Pain-related disorders increasingly prevalent
- ◆ 50% of inpatients/outpatients have pain
- ◆ 30% patients give hospital low marks for pain control
- ◆ Untreated/undertreated pain still common

CDC(2007) *Fast Facts A-Z* @ CDC.gov

Ries et al (2008). SEER Cancer Statistics Review

Martin BI, et al. (2008). Back/Neck Problems. *JAMA*, 299

CDC (2008). Targeting Arthritis: @cdc.gov

National Center for Health Statistics (2006), *Special Feature on Pain*

Jha et al. (2008) [HCAHPS] *NEJM*, 359 (18):1921-31

# Policy Push to Improve Pain Care

- ◆ AHCPR genesis
- ◆ AHCPR guidelines 1, 9, 10, 14 (1992-4)
- ◆ Year 2000, JC Standards integrated
  - Focus: Quality, standardization, & safety
  - 2009 new language, specific pain standard
- ◆ Medicare / Medicaid standards follow suit
  - ... more active in recent years
    - Demand adherence to outdated practices .... but
    - Denies payment if care not evidence-based
    - Non-negotiable, non-collaborative

# TJC Standards, 2009: Patient Rights & Professional Duty

## Rights and Responsibility:

- ◆ Organization respects patient's right to pain management

## Human Resources:

- ◆ Provides orientation to staff on assessing / managing pain

## Medical Staff Chapter

- ◆ Hospital educates all LIPs on assessing & managing pain\*

\*LIPs = licensed independent practitioners

# TJC Standards: Assess, Treat, Reassess and Document Pain PC.01.02.07

Identifying & treating pain is a key part of care

Need to assesses & reassesses patients' pain

- Define how every patient gets screened
- Define who assesses pain & when it is reassessed
- Define how pain information is collected / recorded
- Define when a more in-depth evaluation is needed

## TJC Pain Standards: (continued) PC.01.02.07

Patients can expect that when they have pain ...

- A professional comprehensive assessment of pain
- Evaluation methods will be individualized
  - Consistent with age, condition & ability to understand
- Treat pain when present or refer for treatment
- Effects of treatments will be evaluated

# Ethical Duty of the Nurse

- ◆ Provide clinically competent, ethically defensible care
- ◆ Duty to relieve pain and provide humane care
  - Including those with a suspected/known addiction disorder
  - Administer opioids when clinically indicated & ordered
- ◆ Protect patients/society from unauthorized opioid use
- ◆ When ethical dilemmas exist, communicate them

# Common Patient Barriers

## ◆ Fears

- Pain, effects of drugs, death
- Addiction to analgesics
- Pain will be intolerable

## ◆ Anxiety

- Cured? ... What post-op sensations are “Normal”?

## ◆ Unrealistic expectations

## ◆ Interpretation of experience different than team

- Age, culture, personal / family background

## ◆ Pessimism and Catastrophizing

# Common professional barriers

- Mistaken beliefs about pain &/or its treatment
- Inconsistent assessment / reassessment
- Systems barriers (e.g. computers/access to resources)
- Inadequate “handoff” communication
- Biases, attitudes

# Potential Biases as Barriers

- ◆ Value stoicism and problem-focused coping
- ◆ Expecting a certain degree of pain
- ◆ Patient is drug seeking, solely on the basis of:
  - Report of pain greater than expected
  - Pain medication requirements higher than usual
  - Lifestyle, diagnosis, or demographic factors
- ◆ Nurse is a better judge of the pain than the patient
- ◆ Pain is punishment for sins or wrong-doing

# Pain A Perioperative Problem

- ◆ Nearly all patients have postoperative pain (45 million)
- ◆ Pain is the most common reason for elective procedures
- ◆ Fear of pain is the #1 reason for delaying elective surgery
- ◆ 50% patients still have pain 1 year after surgery
- ◆ 30% patients still have pain 10 years after surgery

National Center for Health Statistics (2006), *Special Feature on Pain*

Jha et al. (2008) [HCAHPS] *NEJM*, 359 (18):1921-31

Kehlet et al. *Lancet*. 2006;367(9522):1618-1625.

Katz J, et al *Clin J Pain*. 1996; 12:50-5.

Martin BI, et al. (2008). Back/Neck Problems. *JAMA*, 299

CDC (2008). Targeting Arthritis: @cdc.gov

# Assessment Barriers

- Self report in the perioperative setting limited
  - Some are alert, verbal & reliable
  - Alert, but non-verbal
  - Non-verbal
- Misunderstandings of pain scales
- Over-reporting / underreporting of Pain
- When to Assume Pain is Present / Relieved?

# Gain Control Model of Pain

Spiritual distress  
 Lost connections  
 Dire meaning  
 Suffering  
 Energy imbalance

## Dampeners

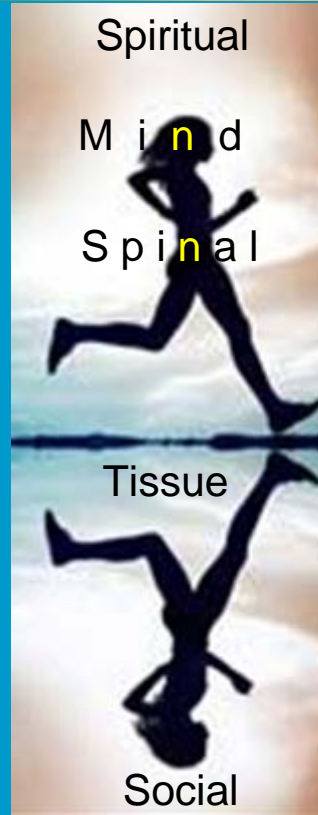
## Amplifiers

Emotionally stable, loved  
 Self efficacy, optimistic  
 Acceptance, realistic appraisal  
 Mental Distraction  
 Pain & stress coping

Counter-stimulation  
 Endorphin release

Tissue repair, healing  
 Tissue stimulation  
 Optimal nutrition, O<sub>2</sub>  
 Position support (brace)

Socially engaged  
 Meaningful, pleasurable  
 activities pursued  
 Effective communication  
 Work, volunteering



Emotional distress  
 High or prolonged stress  
 Unhelpful thoughts

Dermatone overstimulation  
 Central sensitization  
 Neuronal inflammation

Ongoing tissue damage  
 Inflammation/infection  
 Hypoxia  
 Muscle tension/spasm

Socially isolated  
 Relationship/role conflict  
 Over-dependency  
 Dysfunctional coping

Adapted from Arnstein PM (2010) *Clinical Coach for Effective Pain Management*. Philadelphia; FA Davis

# Is pain a symptom or disease?

## Transient pain

- Relatively brief duration
- Etiology known
- Pain proportionate to damage
- ~ Transient objective signs
- Anxiety, anger, fear common

## Persistent pain

- Longer duration
- Etiology ~ unknown
- Pain ~ disproportionate
- Often no objective sign
- Depression is common

# How can Acute Pain become Chronic Pain ...

... despite tissue healing

See pictures and descriptions in :  
Arnstein PM (2010) *Clinical Coach for Effective  
Pain Management*. Philadelphia; FA Davis

# Physiological Categories of Pain

- ◆ Nociceptive

  - Somatic

  - Visceral

- ◆ Neuropathic

  - Central

  - Peripheral

- ◆ Sympathetically Maintained

# Strategies Differ based on Pain Type

- ◆ Acute, Transient Pain
  - Pre-emptive
  - Pain reduction > 50%
  - Functional focus
- ◆ Persistent Pain
  - De-emphasis pain reduction (30%)
  - Functioning and coping despite pain
  - Emotional stability and QOL
- ◆ Pain at the end of life

# How strong is your pain?

No  
pain

Quite a lot  
of pain

Worst Pain  
imaginable

0 1 2 3 4 5 6 7 8 9 10

## Sample Tools for Self-report



0

No hurt



2

Hurts  
little bit



4

Hurts  
little more



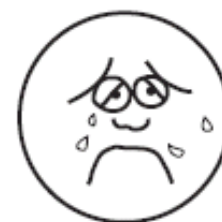
6

Hurts  
even more



8

Hurts  
whole lot



10

Hurts  
worst

# In-Depth Pain Assessment

- W** Words describing pain
- I** Intensity (severity on 0-10 scale)
- L** Location (body part affected)
- D** Duration (change since starting)
- A** Aggravating /Alleviating factors
- A** Activity level & Affect

See specific tools and descriptions in :  
Arnstein PM (2010) *Clinical Coach for Effective Pain Management*. Philadelphia; FA Davis

Adapted with permission  
Regina Fink, RN, PhD  
University of Colorado

# Hierarchy of Pain Assessment

- ◆ Self report (THE “Gold Standard”)
- ◆ In non-verbal patient combination needed
  - Behavioral observation
  - Surrogate reporting
  - Assume Pain is Present
  - Analgesic trials (NSAID or opioid)
- ◆ Avoid using pain as a pressor, or stimulant

# Reassessment after *EACH* Intervention

- **Analgesia:**
  - Numeric rating on same scale
  - Percent reduction in the pain intensity
  - Categorical Relief Scale (some, good, excellent effect)
- **Activity:**
  - Able to better move, follow therapeutic directions or sleep
- **Adverse effects:**
  - Side effects, toxicity, technology-related complications
  - Aberrant behaviors

Opioids:  
1<sup>st</sup> line  
peri-op  
analgesic

# Chemical classes of Opioids

## ◆ Morphinans

- Morphine
- Hydromorphone
- Codeine
- Buprenorphine

## ◆ Phenylheptylamines

- Methadone
- Propoxyphene

## ◆ Phenylpiperidines

- Fentanyl
- Meperidine

Large degree of inter-patient variability, even within class

# Absorption of opioids

- ◆ Lipophilicity affects rate of crossing BBB and the relative potency by route

■ Morphine	Hydrophilic
■ Hydromorphone	Intermediate
■ Methadone	Lipophilic
■ Fentanyl	Lipophilic

# Opioid Analgesic Actions

## ◆ Periphery

- Reduce release of inflammatory products

## ◆ Spine

- Block presynaptic voltage-sensitive  $\text{Ca}^{++}$  ion channels
- Inhibits  $\text{Na}^{+}$  ion channel activity
- Lowers the production and release of EAA
- Lowers postsynaptic excitability ( $\text{K}^{+}$  escape)

## ◆ Brain

- Activates descending pain inhibitors

# Opioids: Effective ... but how safe?

- ◆ Highly effective for a range of pains
- ◆ All opioids are “high alert”
  - Independent double checks advised
  - Vigilant monitoring required
- ◆ Slow IV push
  - Avoid speed-shock
- ◆ Watch for additive sedation; respiratory depression

# Identify Factors Predictive of respiratory depression

- ◆ Basal Rate
- ◆ Age
- ◆ Obesity
- ◆ Upper abdominal surgery
- ◆ Sleep apnea
- ◆ Concomitant CNS depressants
- ◆ Impaired organ function & elimination
- ◆ Respiratory disorders
- ◆ Pump Programming
- ◆ Proxy errors
- ◆ Opioid Naiveté and Opioid Tolerance
- ◆ Trauma patients

# Selection & Initiation of Opioids

- ◆ Best medicine for the individual
  - Pain Intensity
  - Pharmacologic effect
  - Side-effect burden/toxicity
  - Individual vulnerabilities
    - Past Experience
    - Genetic / familial pattern
    - Past drug abuse

# With Impaired Renal / Hepatic Function

## ◆ Renal Impairment

- Avoid drugs with toxic metabolites
  - Demerol, Propoxyphene
  - Co-analgesic compounds
- Titrate opioid, observe for accumulation
  - Fentanyl best (biliary excretion)
  - Methadone good choice (long term use)

## ◆ Hepatic Impairment

- Do not use Acetaminophen or Demerol
- Do not use pro-drugs
  - Codeine – morphine
  - Hydrocodone (Vicodin) to Hydromorphone (Dilaudid)
- Oxycodone, Methadone or Fentanyl ~ best

# Opioid Selection: Poor Choices

- ◆ **Meperidine**
  - Poor absorption and toxic metabolite
- ◆ **Propoxyphene**
  - Poor efficacy and toxic metabolite
- ◆ **Mixed agonist-antagonists** (e.g. pentazocine)
  - Compete with agonists → withdrawal
  - Analgesic ceiling effect
- ◆ **Codeine; Tramadol**
  - Potency similar to ASA
  - Risks of opioids, including falls risk (elderly)

# Potency ~ vary Based on Route

## ◆ Example of Morphine

- 300mg PO
- 100mg IV
- 10mg Epidural
- 1mg Intrathecal

## ◆ Ratio technique used e.g. 3:1 oral:IV

- Patient needs 300mg/d oral, requires 100mg/d IV

# Finding the Correct Dose

- ◆ Establish therapeutic goal
- ◆ Opioid naïve start at standard dose
- ◆ ~Start lower end for those sensitive to meds
- ◆ Start no more than 120% dose for obese
- ◆ Adjust based on response
  - Pain & respirations  $> 10/\text{min}$  as endpoints

# Safe Use of Range Orders

Do not  
base dose  
on pain  
score

- ◆ Permit flexibility & rapid response to patient needs
- ◆ Professional judgment is allowed based on:
  - Patient condition
  - Other medications and Diseases
  - Age
  - Level of consciousness/alertness
  - Vital signs
  - Target symptom severity
  - Anticipated recovery / illness trajectory
- ◆ Patient response pattern matters
- ◆ Intermittent bolus safer than infusion rate change

# Safe, Range Orders (Continued)

- ◆ Range narrow enough to be safe
- ◆ Range wide enough to provide flexibility
- ◆ Start with the lowest dose in the ordered range
  - Unless assessment indicates need for higher dose
- ◆ If symptoms are not relieved,
  - Additional doses within range may be given
  - Total amount  $\leq$  not to exceed maximum dose
  - “Rolling clock” notion of limit
- ◆ Order refinement to increase or decrease dose

# Monitoring

- ◆ In opioid-naïve: peak of 1<sup>st</sup> dose
- ◆ Opioid infusion > risk within 24 hours
- ◆ Nocturnal hypoxemia in (esp. postoperative, OSA pts)
- ◆ Respiratory rate important (but not only) sign
  - Pattern ~ more telling than rate
- ◆ Use scales that measure sedation
- ◆ Analgesia, sedation, respiratory depression

# Equianalgesic Reference Guide

Opioid	Oral	Parenteral IV/IM/SubQ
Morphine	30 mg	10 mg
Oxycodone	20 mg	NA
Hydromorphone	7.5 mg	1.5 mg
Hydrocodone	30 mg	NA
Oxymorphone	10 mg	1 mg
Levopharnol	4 mg	2 mg

Useful for “switching” agents ... or ...

# Predicting opioid dose in opioid-tolerant patients

## ◆ Caveats:

### ■ Equianalgesic charts are based on

- Short term studies of healthy individuals

### ■ May need to reduce calculated dose

- Reduce less if pain severe
- Reduce more if medically frail

### ■ Reduction not needed if

- Using same drug by different route

See details and conversion examples in :

Arnstein PM (2010) *Clinical Coach for Effective Pain Management*. Philadelphia; FA Davis or check out the website

<http://www.globalrph.com/narcoticonv.htm>

# What About Opioid Tolerant and Opioid Dependant Patients?

## ◆ Can you differentiate?

- Physical dependence
- Tolerance
- Opioid-induced hyperalgesia
- Substance abuse
- Addiction
- Pseudoaddiction

# Signs of Withdrawal

- ◆ Vomiting, anorexia, yawning, sweating
- ◆ Tearing, rhinorrhea, congestion, erythema
- ◆ Fidgeting, uneasiness,
- ◆ Pupil dilation, piloerection,
- ◆ Anxious, scared, depressed or irritable
- ◆ Reports of pain, crawling skin, dysphoria

## Whether or not addicted ...

- ◆ Do you want to deal with ...?
  - Physical withdrawal
  - Emotional distress
  - Withdrawal-mediated pain
  - Opioid-induced hyperalgesia
  - Pseudoaddiction

The solution is ....

- ◆ Medicate for pain
- ◆ Expand the treatment team
- ◆ Use a multimodal approach

Think Beyond the Gate to a  
Gain Control Perspective

# Opioid Sparing Techniques

## ◆ Pre-emptive Analgesia

- Scheduled dosing
- Use of local anesthetics
- Cause-directed treatments

## ◆ Multimodal analgesia

- Non-opioid and opioid analgesics
- Adjuvant medications
- Non-drug techniques

# Tissue Level

- ◆ Non-Drug
  - Minimize noxious stimuli at site of pain
  - Careful positioning, promote circulation
  - Acupuncture?
  - Heat / cold applications
  - Low-level lasers
- ◆ NSAID Analgesics
- ◆ Local anesthetics

# Non-Opioids / NSAIDs

## ◆ Benefits

- Good for mild pain
- Good for sore, aching pain
- Limits inflammation
- Treats fever
- Many products
- Available in different routes
- Not habit forming

## ◆ Risks / problems

- Ceiling effect
- May delay healing
- Affect bleeding time
- GI toxicity
- Renal toxicity
- Hepatic toxicity
- Asthma warning
- Risk of CV events

# Acetaminophen (APAP) Limits 2-4Gm/day limit from ALL sources

- ◆ 6 - 12 tablets/day APAP 325<sub>mg</sub> alone ...
  - or combined with: oxycodone, hydrocodone or codeine
- ◆ 4 - 10 tablets/day with 500<sub>mg</sub> alone ...
  - or with: oxycodone, hydrocodone or propoxyphene
- ◆ 3 - 6 tablets/day with 650<sub>mg</sub> alone ...
  - or with oxycodone, hydrocodone or propoxyphene
- ◆ 2 - 5 tablets/day with 750<sub>mg</sub> alone ...
  - or combined with hydrocodone

# NSAIDs Cautions & Contraindications

## ◆ Contraindicated

- Current active peptic ulcer disease,
- Chronic kidney disease or failure,
- Aspirin allergy with anaphylaxis

## ◆ Relative contraindications

- Hypertension
- *H. Pylori* or history of peptic ulcers
- With use of steroids or SSRIs

## ◆ Cautions

- Renal or cardiac disease; hypertension

# Drug Drug interactions

- ◆ NSAID increase toxicity of:
  - Cyclosporine, digoxin, lithium, methotrexate
  - Potentiate Ace-I adverse renal effects
  - Increase levels of:
    - Phenytoin, warfarin
  - Decrease effectiveness of some antihypertensives
    - Ace-I, B blockers, & diuretics

# Topical Local Anesthetics for Brief, Superficial Pain

- ◆ Eutectic Mixture of Local Anesthetics
  - Intact skin, superficial, 60-90 min onset
- ◆ Liposomal lidocaine (no occlusive dsg)
  - ELA-Max 4% same as EMLA but 30min action
- ◆ S-Caine patch (Lidocaine & Tetracaine) 20min
- ◆ Lidoderm 5% lidocaine gel
- ◆ Lidocaine enhancement
  - Iontophoresis electrically charges drug for penetration
  - Sonophoresis (ultrasound); Laser assisted delivery
- ◆ PainEase vapocoolant (not flammable like Ethyl Chloride)

# SubQ Local Anesthetics

- ◆ Use with vasoconstrictors for local (infiltration)
  - Epinephrine ~additive
    - limits spread, prolongs action (2-3x)
    - Not used on toes, fingers, nose, ear, penis
- Absorbed into blood stream, metabolized by liver, excreted in urine (2hr  $\frac{1}{2}$  life)
- Adverse effects (occur with IV injections)
  - CNS: Seizures, lethargy, coma,
  - CV: bradycardia, dysrhythmias
  - Allergic: status asthmaticus,

# At The Spinal / Regional Level

- ◆ Reduce noxious stimuli along dermatome
- ◆ Good posture, alignment
- ◆ Proximal, distal, contralateral cutaneous stimulation  
(e.g. touch, heat/cold, rubbing)
- ◆ Opioid and neuro-active co-analgesics
- ◆ Epidural, regional or peripheral nerve blocks

# Epidural Pharmacology: Local Anesthetic

- Onset 5-20 minutes Peak 60 minutes
- Duration 4-6hrs (Steady state 24hrs)
- Side Effects
  - Hypotension, orthostasis
  - Sensory/motor block
  - Proprioceptive block
  - Urine retention
- Early Toxicity:
  - Thick tongue sensation, metallic taste, lip numbness, tinnitus
- Late Side Effects: (rare)
  - Seizures, cardiac arrhythmias or cardiac arrest

# Epidural Opioid Pharmacology

## ◆ Hydromorphone

- Onset 15-30 min
- Peak 30-60 min
- Steady state 24hrs
- Duration up to 10 hrs

## ■ Side Effects

- Sedation
- Respiratory depression
- Itching
- Nausea/vomiting/constipation
- Urinary retention

## ◆ Fentanyl

- Onset 5 min
- Peak 30-60 min
- Steady state 24hrs
- Duration up to 3 hrs

# At The Mind / Brain Level

- ◆ Reduce anger, anxiety fear and stress
- ◆ Empower with education & control of decisions
- ◆ Distraction (Music, Humor, Hobbies, Reading)
- ◆ Changing Perceptions (thought stopping, reframe)
- ◆ Changing Responses to pain (e.g., biofeedback)
- ◆ Opioid and neuro-active co-analgesics

# Antidepressants

- ◆ Best evidence: 3<sup>o</sup> amine TCAs (eg, amitriptyline)
- ◆ 2<sup>o</sup> amine TCAs (desipramine, nortriptyline) similar with less side effects
- ◆ SSNRIs growing evidence of efficacy
  - Duloxetine (Cymbalta), Venlafaxine (Effexor XR)
  - Atypical antidepressants may be tried
    - Trazodone (Desyrel), Bupropion (Wellbutrin)
- ◆ SSRI may help underlying mood disorder (not pain)
  - Paroxetine (Paxil), Fluoxetine (Prozac)

# Gabapentin

- ◆ Gabapentin  $\leq$ 1200mg Pre-operatively
  - Less pain, opioid use, fewer GI SE, less delirium
  - More sedation
- ◆ 800mg pre-op not opioid sparing for lumbar discectomy
- ◆ Continuing X3 days ~ less chronic pain, studies underway
- ◆ Other Anti-Epileptic Drugs
  - Pregablin equally effective, better tolerated, emerging data
  - Perioperative value of other AEDs uncertain

Ho et al. (2006) Pain 91-101

Radharkrishnan et al (2005) J. Neurosurg Anesthesiol 125-128

Turan et al (2006) Anesth Analges 175-181

Hurley et al. (2006). Reg Anesth Pain Med 237-247

# Other Perioperative Adjuvants

- ◆ Methadone bolus
- ◆ Ketamine boluses < 1mg/kg
- ◆ Lidocaine infusions 2mg/kg
- ◆ Dexmedetomidine 0.5 mcg/kg/hr

Mitra, S., & Sinatra R. S. (2004). *Anesthesiology*, 212-227

Bourne, N (2008) *Journal of Perioperative Practice*, Nov,

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Dholaka C et al, (2007). *J. Gastrointest Surg.* 1556-1559.

Schmid RL et al. (1999) *Pain* 111-125

Peng PWH (2005) *CJ Anesth.* 1496-8975

# At The Spiritual Level

- ◆ Strong faith
- ◆ Essence unchanged
- ◆ Sense of purpose
- ◆ Sense of connection
- ◆ Energy flow balanced
- ◆ Spiritual and energy-based techniques

# At The Social Interaction Level

- ◆ Presence of a caring person
- ◆ Relaxation, Imagery, Hypnosis
- ◆ Therapeutic (healing) Touch
- ◆ Optimize environments (internal / external)
  - Wellness: sleep, activity, lifestyle
- ◆ Problem-solving and goal-setting

# Pain Treatment Plan Summary

- ◆ Base Rx plan on assessment data
  - Align med with pain type
  - Align med with pain intensity
  - With opioids use multimodal therapy
- ◆ Titrate for effect or change agent
- ◆ Multimodal Therapy
  - Consider adding coanalgesics &/or adjuvants
  - Add non-drug coping/comforting methods
- ◆ Monitor & refine for individual
- ◆ Document

# Thank you for your interest in Pain Management Nursing



**CLINICAL  
COACH**

*for*

**Effective Pain  
Management**

PAUL ARNSTEIN

Check out the new pocket  
guide through FA Davis or  
email me at  
[pmarnstein@partners.org](mailto:pmarnstein@partners.org)