"NEW" DEVELOPMENTS IN ACUTE PAIN MANAGEMENT

The Changing Practice of Anesthesia
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DISCLOSURES
Honararium from Medtronic
Coverage of Travel Expenditures from Boston Scientific

ACUTE PAIN SERVICES
Started in academic centers in the late 1980s.
Regional Catheter Service
- Medication Management
- Multi-Disciplinary Service

MEDICINE
Keown, O. Lessons from Eight Countries on Diffusing Innovation in Health Care. Health Affairs, Sep 2014

Rogers Diffusion Of Innovation Bell

SPECIAL ARTICLE
Development of an Anesthesiology-based Postoperative Pain Management Service
Anesthesia, 1991, Volume 96, pages 160-169

Occasional Review
Postoperative pain management and Acute Pain Service activity in Canada
R. G. Wheatley, T. H. Madej, J. B. Jackson and D. Hunter
British Journal of Anaesthesia, 1991, 67: 393-399

Introducing an acute pain service
P. D. Cartwright, R. G. Helphinger, J. S. Howell, and K. K. Siegmund
Reedy, Anesthesiology, 1988
Cartwright, Anaesthesia, 1991
Wheatley, BJA, 1991
Some of the topics covered today are not particularly new. Not all new (recently developed) subjects will be covered… Just those deemed relevant by the presenter. FDA indications, or lack thereof, will be stated.
**PAIN MANAGEMENT**

**PERI-OP**

**ENHANCED RECOVERY AFTER SURGERY [ERAS]**

**Evidence**
- Adamina, Surgery, 2011
- Fawcett, BJA, 2012
- Joshi, Colorectal Disease, 2012
- Mortensen, Brit J of Surg, 2014

**UCSF COLORECTAL ENHANCED RECOVERY PATHWAY**

**ANESTHESIA**
- Meds: Order Pre-Op warming and IV fluids 30 ml/hr
- Sublingual: Nitroglycerin PO 1 mg
- Atropine: 0.5 mg PO q 30 min
- Dexamethasone (Optional): 5 mg PO q 12 h
- Meclizine (Optional): 25 mg PO q 12 h

**SURGERY**
- Patient temperature must not drop below 36.0 C.
- Intravenous: Creation of Hemostasis or Mepirex
- Thoracic Epidural: Cefazolin 25 mg/kg IV over 10 minutes

**REGIONAL**
- Anticoagulation: Heparin 5kU SQ TID
- Analgesia: Management
  - Pre-Op: Hydromorphone or Morphine
  - Pre-op: Dexamethasone 4 mg IV
  - Pre-op: Ondansetron 4 mg IV

**POST**
- Pre-op: Gabapentin 600 mg PO qHS
- Gabapentin: 600 mg PO qHS
- Acetaminophen: 1000 mg PO qHS
- Toradol (if eGFR > 60): 15 mg IV q6H
- Out of bed: Ad lib
- Out of bed: Ambulation
- Incentive Spirometry x 15 q 1H

**REGIONAL**
- Intravenous: Hydromorphone or Morphine IV
- Thoracic Epidural: 0.0625% Ropi + Fentanyl 2 mcg/ml at 8 mL/hr

**HOSPITAL**
- Out of bed: Ambulation
- DVT: Heparin 5kU SQ TID
- Foley Catheter: Gravity
- Incentive Spirometry: 15 q 1H
- TKA (Swank, 2013)
- Colorectal (Gillis, Anesthesiology, 2014; Carli, B J Surg, 2010)
- Spine (Nielsen, Clin Rehabil, 2010)
PAIN MANAGEMENT

PRE-OP

CATASTROPHIZATION: characterized by the tendency to magnify the threat value of pain stimulus and to feel helpless in the context of pain, by a relative inability to inhibit pain-related thoughts in anticipation of, during or following a painful encounter.

(Quartana, Expert Review Neurotherapeutics, 2009)

Evidence:
- Catastrophization and Pre-Op Anxiety play a role in the development of Persistent Post-Surgical Pain (Theunissen, Clin J of Pain, 2012)
- Pre-Op Catastrophizing and Post-Op Pain in Cardiac Surgery (Khan, Pain Med, 2012)

PAIN MANAGEMENT

PRE-OP INTRA and POST-OP

LIPOSOMAL BUPIVACAINE

No catheter. No pump. Less worries about antithrombotics… Does it work? Is it safe?


FDA Approved. Hemorrhoidectomy & Bunionectomy

PAIN MANAGEMENT

PRE-OP

FOCUSED COLD THERAPY / COOLED RADIOFREQUENCY ABLATION / PULSED RADIOFREQUENCY ABLATION

Hsu, M. J of Neuro Disorders, Jun 2014

PAIN MANAGEMENT

PRE-OP

FOCUSED COLD THERAPY / COOLED RADIOFREQUENCY ABLATION / PULSED RADIOFREQUENCY ABLATION

<table>
<thead>
<tr>
<th>Treatment Method</th>
<th>Primary Type of Targeted Nerve</th>
<th>Duration of Clinical Degeneration of Nerve</th>
<th>Regeneration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol Injection</td>
<td>Sensory and Motor</td>
<td>Months to Years</td>
<td>Normal to Mild deficit</td>
</tr>
<tr>
<td>Alcohol Injection</td>
<td>Sensory and Motor</td>
<td>Months to Years</td>
<td>Normal to Mild deficit</td>
</tr>
<tr>
<td>Cryoneuroablation (~100°C)</td>
<td>Sensory</td>
<td>Months to Years</td>
<td>Mild deficit</td>
</tr>
<tr>
<td>Cryoneuroablation (~40°C)</td>
<td>Sensory, Emerging Use for Motor</td>
<td>Months to Years</td>
<td>Normal</td>
</tr>
<tr>
<td>Conventional Radiofrequency</td>
<td>Sensory</td>
<td>Months to Years</td>
<td>Moderate to severe deficit</td>
</tr>
<tr>
<td>Pulsed Radiofrequency</td>
<td>Sensory</td>
<td>Months to Years</td>
<td>N/A</td>
</tr>
<tr>
<td>Transection</td>
<td>Sensory</td>
<td>Permanent</td>
<td>None</td>
</tr>
</tbody>
</table>

Hsu, M. J of Neuro Disorders, Jun 2014
PAIN MANAGEMENT

INTRA and POST-OP
PROGRAMMED INTERMITTENT BOLUS

Evidence:
- TKA (Aveline, Eur J Pain, 2009)
- Spine (Loftus, Anesthesiology, 2010)
- Laparoscopy (Kaba, Anesthesiology, 2007)
- Abdominal Surgery (Marret, Brit J of Surg, 2008)

PAIN MANAGEMENT

INTRA and POST-OP
LOW-DOSE KETAMINE INFUSION
LOW-DOSE LIDOCAINE INFUSION
LOW-DOSE DEXMEDETOomidine INFUSION

Evidence:
- TKA (Aveline, Eur J Pain, 2009)
- Spine (Loftus, Anesthesiology, 2010)
- Laparoscopy (Kaba, Anesthesiology, 2007)
- Abdominal Surgery (Marret, Brit J of Surg, 2008)

PAIN MANAGEMENT

POST-OP
INTRANASAL KETOROLAC

Completed Phase III Trials

SUFENTANIL NANOTAB (ZALVISO)

Completed Phase III Trials
HYDROCODONE-CONTAINING COMPOUNDS. #1 Rx in USA.

JAN 14, 2014: ACETAMINOPHEN RESTRICTED TO 325mg or less

OCTOBER 6, 2014: WILL BE MOVED FROM SCHEDULE III to SCHEDULE II

NALOXONE HOME KIT

FDA Approved.

NALOXEGOL (MOVANTIK) - 2014: Oral peripheral mu-antagonist for opioid-induced constipation.

Chey, NEJM, 2014. Statistically improved constipation (40% vs 29%) with naloxegol vs placebo.
THE STATE OF ACUTE PAIN MANAGEMENT


THE FUTURE OF ACUTE PAIN MANAGEMENT

Collaborative strategies that:
- Reduce Cost: length of stay (LOS) & readmission rates- ERAS
- Reduce Opioid Consumption.
- Improve HCAHPS scores
- Employ The Perioperative Surgical Home.
- Reduce Persistent Post-Surgical Pain.

Methods to prolong neural blockade

Methods to manage opioid-related complications.

Disconnecting from the IV.

Health sensors that interface with our EMR to track patient progress.

Tracking of outcomes.

A need to more efficiently and safely adopt new ideas and technologies that can reduce severe acute pain and the development of chronic pain.