Strategies to Prevent Opioid-Induced Respiratory Depression (OIRD) in Acute Care

The Decade of Pain Control & Research

• TJC: Pain Standards – 2000
  – Requiring hospitals to provide safe and effective pain management
• US Congress - 2000-2010
  – Declared the “Decade of Pain Control & Research”
• IASP 2010
  – “access to pain management is a fundamental human right”

Purpose & Objectives

By the end of this presentation the learner should be able to:

• Identify two evidence-based strategies to promote safe, quality pain management in acute care
• Discuss two strategies to decrease sentinel events related to opioid-induced sedation and respiratory depression

Historical Perspective

• IASP founded – 1974
• APS founded – 1977
• NPA – 1987
• ASPMN – 1990
• 1990-2000 – Various Standards of Practice & Guidelines Published
  – WHO Cancer/Palliative Care, Acute Pain Management, Chronic Pain in Elderly

Scope of the Problem

• IOM - 2011
• Pain is the primary reason patients seek healthcare

Pain is associated with negative patient outcomes

• ↑ HR/CO, ↑ PVR
• ↑ O2 Demand → Ischemia, MI, UA
• ↑ Coagulation → Risk for DVT
• ↑ Tidal Volume → Hypoxia
• ↑ Cough → pneumonia, atelectasis
• ↑ Mobility → weakness, fatigue, ↑ risk of falls

Comfort is associated with positive patient outcomes

• ↑ Immune Function
• Desirable effects on BP, HR & RR
• Patient Satisfaction
• ↑ Health-Seeking Behaviors
• Peaceful Death

Pain represents a national challenge. A cultural transformation is necessary to better prevent, assess, treat, and understand pain of all types.
Current State

Opioid Addiction

**Addiction** is characterized by:
- Inability to consistently Abstain;
- Impairment in Behavioral control;
- Craving; or increased “hunger” for drugs or rewarding experiences;
- Diminished recognition of significant problems with one’s behaviors and interpersonal relationships; and
- A dysfunctional Emotional response.

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**National Pain Strategy**

A Comprehensive Population Health-Level Strategy for Pain

- New knowledge
- Prevent pain chronification
- Need to improve pain assessments
- Promote self management
- Taper/DC Ineffective Tx when risk>>>benefits

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**How do we fix this?**

B – Balanced Approach
R – Realistic Goal Setting
A – Assess
C – Conscientious Care Planning
E – End-Tidal CO2

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**Balanced Analgesia**

Follow orders, trust the system, empathetic, well-intentioned

**Comfort/Function Goals**

1. **SMART** goals
   1. Does NOT need to be a #
   2. Relate to function or activity that supports overall outcome goals (recovery, healing, restoration of previous functioning, etc.)
   1. Incentive Spirometry
   2. PT/OT
   3. Mobility
   4. Sleep
Patient's Perspective

- “When I am not in pain and I can function”
- “Just make me comfortable”
- “Help control my pain”
- “Removing cause of pain or providing relief of pain until cause can be determined or removed”
- “My hope is that they can find out what is causing my pain”
- “When I’m not in pain anymore”
- “Tolerable and can function”
- “The doctor does not believe me, need to listen to the patient”
- “Lidocaine works great for me for bone marrow biopsy; no need for strong medication or opioids”

Evidence-Based Practice Recommendations

- **Documentation tools** can be useful in communicating patients’ underlying conditions, comorbidities and risk factors, previous use and response to opioid therapy, opioid naive or tolerant status, anesthesia history, and current opioid therapy and response. Class IIa

- Institutions should establish procedures to ensure safe monitoring practices to help prevent opioid-induced adverse events. Class I

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**Assessment**

<table>
<thead>
<tr>
<th>Patient Population</th>
<th>Pain Assessment Tools*</th>
<th>Sedation / Risk Assessment Tools</th>
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</thead>
<tbody>
<tr>
<td>Premature infant to 3 months</td>
<td>&gt; RAPASS</td>
<td>&gt; NPASS</td>
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<tr>
<td>3 months to 3 years</td>
<td>&gt; RIPS</td>
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<td>&gt; CRSS</td>
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<td></td>
<td>&gt; PAIN</td>
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<tr>
<td>3 years to 7 years</td>
<td>&gt; #PLCC/FLACC</td>
<td>&gt; COMFORT</td>
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<td></td>
<td>&gt; PACE</td>
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<td></td>
<td>&gt; #PLCC/FLACC</td>
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<td>&gt;7 years</td>
<td>&gt; RRS</td>
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<td>&gt; PPS-R</td>
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<td>&gt; #PLCC/FLACC</td>
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<td>Adolescents &amp; Adults</td>
<td>&gt; RRS</td>
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<td>&gt; Verbal Descriptor Pa</td>
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<td></td>
<td>&gt; IOWA Pain Scale</td>
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<td>&gt; Functional Pain Scale</td>
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<td>&gt; EPOT</td>
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<td>&gt; MPI</td>
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<td></td>
<td>&gt; MOSS</td>
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<tr>
<td>Nonverbal/Cognitively Impaired</td>
<td>&gt; FLACC/FLACC</td>
<td>&gt; POSS</td>
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<td>&gt; UMPI</td>
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<td></td>
<td>&gt; PAINAD</td>
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</tbody>
</table>

**Pasero Opioid-Induced Sedation Scale (POSS)**

Note the “Row Information”
Evidence-Based Practice
Opioid Safety

STOPBANG
- Snoring
- Tiredness
- Observed apnea
- Pressure (HTN)
- Body Mass
- Age
- Neck Size
- Gender

MOSS

“It is more important to know where we are going than to get there quickly.”

-Anonymous

Failure Modes and Effects Analysis (FMEA)
- A team-based systematic and proactive approach for identifying the ways that a process can fail, why it might fail, the effects of that failure, and how it can be made safer.
- The goal is to eliminate or minimize the potential for failures, to stop failures before harm reaches the patient, or to minimize the consequences of the failure.
- FMEA focuses on how and when a process will fail, not IF it will fail.
Functional Block Diagram with Task Identification

1. Planning
   - EMR Build
   - Education
   - Implementation
   - Evaluation

Tasks:
1.1 Key Stakeholders
1.2 Alignment with other initiatives
1.3 Timeline

2. Documentation
   - Committee
   - Across applications
   - View for other disciplines

3. Method
   - Go-Live Support
   - Timeline
   - Just in time education

4. Implementation
   - 5.1 ongoing PI
   - 5.2 Risk Mgmt reporting
   - 5.3 PDCA Follow-up Plan

5. Evaluation

Harpel & Giannini, 2014

SWOT

Strengths
- Supporting Literature
- Pain Champions
- Clear Assessment Times (Q4H x24)
- Multimodal Pain Management Order Sets

Weaknesses
- Double Documentation (Paper & Electronic)
- Turnover of RN/Nurse Leadership

Opportunities
- Improve Patient Safety
- Increase RN autonomy with Nurse Driven Tool
- Decrease RRT
- Decrease Narcan Use

Threats
- Other competing pilots
- Challenge to Assess Pain Post-Op r/t Sedation Half-Life

MOSS Cont.

My List

Fall Risk

This MOSS interpretation and last documented MOSS components populate the bottom of the screen if you choose in the “MOSS RN Action”

Best Practice Advisory - BPA

Risk for OIRD

– Obstructive Sleep Apnea
– Obesity Hypoventilation Syndrome (OHS)
– Central Sleep Apnea

• Respirations most vulnerable during sleep/sedation:
  - Loose muscle tone in pharyngeal airway
  - Loss of protective wake mechanism

Care Plan for Highest Risk

– Opioid Induced Respiratory Depression
– Hypoventilation Syndrome
– Central Sleep Apnea

Supporting Literature
- Pain Champions
- Clear Assessment Times (Q4H x24)
- Multimodal Pain Management Order Sets

Weaknesses
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OIRD: Opioid Induced Respiratory Depression
Respiratory (Patho)physiology

- Chemoreceptors regulate breathing

Capnography

- What is it?
  - The non-invasive continuous measurement of the partial pressure of carbon dioxide (CO₂) at the end of an exhaled breath (aka End Tidal CO₂ = EtCO₂)
  - Can detect hypoventilation, airway obstruction and increasing respiratory depression sooner than decreasing SaO₂ values

- Normal Value = 35-45 mmHg

Capnography vs. Oximetry

<table>
<thead>
<tr>
<th>Capnography</th>
<th>Oximetry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflects ventilation=movement of air in and out of lungs &amp; how we get rid of CO₂</td>
<td>Reflects oxygenation= transport of O₂ via bloodstream to cells</td>
</tr>
<tr>
<td>Detects apnea and hypoventilation immediately</td>
<td>May take many minutes to detect apnea or hypoventilation</td>
</tr>
<tr>
<td>Not affected by perfusion to extremity</td>
<td>Affected by perfusion to extremity</td>
</tr>
<tr>
<td>Reflects changes in:</td>
<td>Reflects changes of oxygen concentration in blood stream</td>
</tr>
<tr>
<td>-Ventilation= air movement</td>
<td></td>
</tr>
<tr>
<td>-Diffusion= gas exchange at alveoli</td>
<td></td>
</tr>
<tr>
<td>-Perfusion= circulation of blood</td>
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</tbody>
</table>

Capnography Equipment

- Can use up to 5L 02 per NC

Indications for EtC02 Monitoring

1. Cardiac arrest per American Heart Association (AHA), monitored after advanced airway in place
2. Sedation procedures — Part of Narrator
3. Patients at risk of respiratory compromise who have an opioid PCA/PCEA. Risk factors include:
   a. Age ≥ 65 years
   b. Obesity (BMI ≥35 kg/m²)
   c. Untreated obstructive sleep apnea (OSA)*
   d. History of witnessed apnea
   e. Concomitant use of benzodiazepines or antihistamines
   f. Opioid naïve and basal rate on PCA/PCEA
   g. Use of naloxone during current episode of care
   h. ASA class 3-5

Notes:
*OSA= is a disorder in which a person frequently stops breathing during sleep. Untreated = no CPAP use by patient but has been diagnosed with OSA.

Normal Capnography Waveform

The key to understand the capnogram is to watch the trending of the waveforms.
Abnormal Waveform - Hypoventilation

**SEEN IN:**
- Sedation
- Shallow breathing
- Fever

**INTERVENTION:**
- Encourage patient to take deep breaths
- Adjust sedative meds
- Adjust ventilator settings

Abnormal Waveform - Partial Airway Obstruction

**SEEN IN:**
- Asthma
- COPD
- Secretions/Mucous Plug
- Relaxation of upper airway (Sleep Apnea)
- Kinked ETT/vent circuit

**INTERVENTION:**
- Open Airway/CPAP
- Bronchodilators
- Suction
- Bronchoscopy
- Un-kink ETT/circuit

Abnormal Waveform - Apnea

**SEEN IN:**
- Sedation
- Complete upper airway obstruction
- Apnea

**INTERVENTION:**
- Stimulate patient
- Head tilt/chin lift
- Discontinue sedation
- Get help/SRRT/Code Blue

Abnormal Waveform - Rebreathing

**SEEN IN:**
- Insufficient oxygen flow
- Material over patient face
- Increased ventilator dead space

**INTERVENTION:**
- Remove anything over patient face
- Increase oxygen flow
- Assess equipment
- Decrease ventilator dead space

**EtC02 in Cardiac Arrest**

- Sudden increase in EtC02
  - Return of spontaneous circulation (ROSC)

- EtC02 of 10-20 mmHg during CPR = good quality compressions

- Return of Spontaneous Circulation (ROSC) = sudden and persistent increase in EtC02 of ≥40 mmHg

- The only way to measure EtC02 during an arrest is AFTER an advanced airway (i.e. endotracheal tube) has been placed

**EtC02**

- Arousal Effect
  - Sp02 vs. EtC02
    - Intermittent vs. Continuous
How do we fix this?

B – Balanced Approach
R – Realistic Goal Setting
A - Assess
C – Conscientious Care Planning
E – End-Tidal CO2

Safe Medication Disposal

Over 60% of diverted prescription medications are obtained from a family member or friend → Patient Education!

http://disposemymeds.org/

Quality Pain Management

HCAHPS Pain Domain Team formed and created goal to achieve top decile in Pain Management

What is a Pain Resource Nurse?

“A Pain Resource Nurse is a registered nurse who functions both as a resource and a change agent in disseminating information, interacting with nurses, physicians and other healthcare providers, and patients and families to facilitate quality pain management”

Pain Resource Nurse Role: Description and Responsibilities
City of Hope Professional Resource Center
www.cityofhope.org/prc

(Ferrell, Grant, Ritchey, Ropchan & Rivera, 1993)
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