Use of Low-Dose Ketamine to Treat Post-Op Pain – An EBP Exemplar

Allison Hanson, BSN, RN
Michele Farrington, BSN, RN, CPHON
Trudy Laffoon, MA, RN-BC
Anne Smith, MSN, RN-BC

Conflict of Interest Disclosure

- The speakers do not have any conflicts of interest or disclosures to report.

Use of Low-Dose Ketamine to Treat Post-Op Pain – An EBP Exemplar
Objectives

- Describe an evidence-based practice (EBP) training program for staff nurses that follows the steps in the Iowa Model of Evidence-Based Practice to Promote Quality Care.
- Describe an EBP staff nurse internship project related to use of low-dose ketamine infusions for opioid-tolerant orthopedic spine patients.

Evidence-Based Practice Staff Nurse Internship


Internship Program Objectives

- Stimulate innovative thinking regarding practices to improve quality, patient safety and patient outcomes.
- Assist staff nurse led teams to apply the Iowa Model of Evidence-Based Practice to Promote Quality Care in development, implementation and evaluation of evidence-based practices.
- Foster professional growth of staff nurses.
Internship Overview

- Pilot program-2001
- Funding
- Mass notification of announcement
- Basic eligibility criteria
- Simple application
- Signed contract
- Competitive review process
- 18 month program
- 12 meetings/year
- Facilitated work time
- Staff nurse, APN, & NM teams
- Administrative support
- Free CEUs

Internship Resources

- Program manual
- Unit leadership
- EBP mentor(s)
- EBP facilitator
- Librarians
- Tools and tips
- Troubleshooting help throughout

Iowa Model of Evidence-Based Practice to Promote Quality Care

Tibb et al., 2001
Problem Focused Triggers
1. Risk Management Data
2. Process Improvement Data
3. Internal/External Benchmarking Data
4. Financial Data
5. Identification of Clinical Problem

Knowledge Focused Triggers
1. New Research or Other Literature
2. National Agencies or Organizational Standards & Guidelines
3. Philosophies of Care
4. Questions from Institutional Standards Committee

Triggers for Topic Generation

- Problem-Focused
  - Risk management data
  - Process improvement data
  - Internal/external benchmarking data
  - Financial data
  - Identification of clinical problem

- Knowledge-Focused
  - New research or other literature
  - National agencies or organizational standards and guidelines
  - Philosophies of care
  - Questions from institutional standards committee

Project Triggers
- Staff knowledge
- Patient satisfaction scores
Benefits of a Purpose Statement

- Narrows topic
- Specifies patient population and practice setting
- Helps articulate outcomes to be achieved
- Addresses types of providers to consider
- Directs evidence search to best resources
- Helps focus reading
- Sets boundaries around the work to accomplish

Purpose Statement

- The purpose of this evidence-based practice project was to determine if low-dose ketamine infusions can lower post-operative pain in opioid-tolerant orthopedic spine patients.

Iowa Model (cont.)
Basics of Organizational Priority

- How to find current priorities:
  - Messages from senior leadership
  - Strategic plan
  - Core data
  - New initiatives (clinical and related activities)
  - National initiatives

Organizational Priority

- Pain initiative
- Patient satisfaction
- Length of stay
- Cost
- Interdisciplinary support
- EBP Staff Nurse Internship

Iowa Model (cont.)

- Problem Focused Triggers
  1. Risk Management Data
  2. Process Improvement Data
  3. Internal/External Benchmarking Data
  4. Financial Data
  5. Identification of Clinical Problem

- Knowledge Focused Triggers
  1. New Research or Other Literature
  2. National Agency or Organizational Standards & Guidelines
  3. Philosophies of Care
  4. Questions from Institutional Standards Committee

Consider Other Triggers

Is this Topic a Priority For the Organization?

Yes

Form a Team

No
Iowa Model (cont.)

Assemble Relevant Research & Related Literature

Critique & Synthesize Research for Use in Practice

Is There a Sufficient Research Base?

Yes

No

Pilot the Change in Practice

1. Select Outcomes to be Achieved
2. Collect Baseline Data
3. Design Evidence-Based Practice (EBP) Guideline(s)
4. Implement EBP on Pilot Units
5. Evaluate Process & Outcomes
6. Modify the Practice Guideline

Base Practice on Other Types of Evidence

1. Case Reports
2. Expert Opinion
3. Scientific Principles
4. Theory

Search Strategy

- Electronic database search
  - PubMed
  - CINAHL
- Key Words
  - Ketamine (Ketalar)
  - Lumbar spine
  - Surgery
  - Postoperative
  - Pain
  - Analgesia
Use of Low-Dose Ketamine to Treat Post-Op Pain – An EBP Exemplar

Allison Hanson, BSN, RN
Michele Farrington, BSN, RN, CPHON
Trudy Laffoon, MA, RN-BC
Anne Smith, MSN, RN-BC

Synthesis of Evidence

- Opioid-tolerant patients have complex pain management needs
- Untreated acute pain may lead to development of persistent pain
- Cost of chronic pain estimated at $635 billion/year in the United States
  - Medical treatment
  - Lost worker productivity

Synthesis of Evidence (cont.)

- Low-dose ketamine infusions may provide analgesia for opioid-tolerant patients undergoing surgery
  - Resets opioid receptors
  - Reduces opioid requirements post-operatively
  - Decreases opioid side effects
- Ketamine side effects warrant special attention and patients need frequent monitoring

Synthesis of Evidence (cont.)

- Patients receiving intra-operative ketamine used about 30% less morphine in the first 24 hours and 37% less morphine in the first 48 hours after surgery
  - Opioid-tolerant patients
  - Lumbar spine surgery
- Patients receiving IV ketamine bolus at end of surgery demonstrated lower morphine consumption rates post-operatively

Dunwoody et al., 2008; Dykstra, 2012
Abrishamkar et al., 2012; Loftus et al., 2010
Bilgin et al., 2005; Loftus et al., 2010
Sufficient Research Base

- Sufficient evidence
  - Untreated acute pain leads to persistent pain
  - Opioid-tolerant patients have complex pain management needs
  - Ketamine has been helpful for opioid-tolerant patients
  - Ketamine side effects warrant special attention

- Policy since 2011
Pilot the Change in Practice

- Select Outcomes to be Achieved
- Collect Baseline Data
- Design Evidence-Based Practice (EBP) Guideline(s)
- Implement EBP on Pilot Units
- Evaluate Process & Outcomes
- Modify the Practice Guideline

Patient Population

- Orthopedic clinic
- Inpatient orthopedic unit
- Opioid-tolerant
- Spine surgery

Select Outcomes to Be Achieved

- Improved pain management
- Increased nurse & provider knowledge regarding ketamine
- Consistent referrals to acute pain service
- Improved patient satisfaction
Use of Low-Dose Ketamine to Treat Post-Op Pain – An EBP Exemplar
Allison Hanson, BSN, RN
Michele Farrington, BSN, RN, CPHON
Trudy Laffoon, MA, RN-BC
Anne Smith, MSN, RN-BC

### Design the Practice Change

- Interdisciplinary acute pain service created a consistent referral process for opioid-tolerant patients undergoing orthopedic spine surgery
- Pre-operatively, pharmacist and patient collaborate to develop a surgical pain treatment plan
- Revised nursing policy for ketamine

### Design EBP Guideline

- **Updated:**
  - Nursing ketamine policy for adult patients
  - Adult IV ketamine medication administration guideline
  - Ketamine order set
  - Ketamine medication administration record
- **Created:**
  - Patient education handout

### Collect Baseline Data

- Pre/post comparisons
  - Patient questionnaires
    - Perceptions
  - Staff questionnaires
    - Knowledge
    - Perceptions
    - Practices

---

*Farrington et al., in press*
Patient Questionnaire

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have you had surgery in the last month?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>2. Have you had any previous complications?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>3. Have you had any previous pain issues?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>4. Have you had any previous sedation issues?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

Implementation Strategies

I. Create Awareness & Interest
- Highlight compatibility
- Educational opportunities
- Public relations
- Staff education
- EMR alerts
- Child-friendly key messages

II. Build Knowledge & Commitment
- Educational opportunities
- Educational materials
- Educational outreach
- Staff education
- EMR alerts
- Child-friendly key messages

III. Promote Action & Adoption
- Educational opportunities
- Educational materials
- Educational outreach
- Staff education
- EMR alerts
- Child-friendly key messages

IV. Pursue Integration & Sustained Use
- Educational opportunities
- Educational materials
- Educational outreach
- Staff education
- EMR alerts
- Child-friendly key messages

Patient Education Handout

- Process:
  - One page handout drafted
  - Plain language review completed
  - Patient Education Committee approved
  - Marketing Department formatted and finalized

- Handout to be distributed by acute pain service
- Goal – house-wide availability after pilot
Pocket Card & Patient Education

Evaluation – Patient Questionnaire

■ In general, my pain intensity while in the hospital was…

<table>
<thead>
<tr>
<th>Pain Intensity</th>
<th>Pre-Group (n=3/20)</th>
<th>Post-Group (n=4/10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Moderate</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Mild</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>None</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Evaluation – Patient Questionnaire (cont.)

■ I understand why I received ketamine…

<table>
<thead>
<tr>
<th>Understanding</th>
<th>Pre-Group (n=3/20)</th>
<th>Post-Group (n=4/10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>To some extent</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
Evaluation – Patient Questionnaire (cont.)

- I was allowed to participate in decisions about my pain treatment as much as I wanted to be…

Evaluation – Staff Questionnaire

- Response Rates
  - Pre-implementation – 65% (n=50/77)
  - Post-implementation – 25% (n=22/88)

- Staff Knowledge
  - 72% correct (pre) improved to 77% correct (post)

Evaluation – Staff Questionnaire (cont.)
Iowa Model (cont.)

Continue to Evaluate Quality of Care and New Knowledge

Is Change Appropriate for Adoption in Practice?

Yes

No

Institute the Change in Practice

Disseminate Results

Worker and Analyze Structure, Process, and Outcome Data

- Environment
- Staff
- Cost
- Patient and Family

Change Appropriate for Adoption in Practice?

Decision – question about whether the practice change and implementation plan worked as intended

Guided direction about moving to integration

- Additional planning and internal reporting were important next steps
- Reinfusion

Change Appropriate for Adoption in Practice?

Decision – question about whether the practice change and implementation plan worked as intended

Guided direction about moving to integration

- Additional planning and internal reporting were important next steps
- Reinfusion

Conclusion

EBP project led to:

- Improved staff knowledge regarding ketamine for pain
- Proactive identification of opioid-tolerant orthopedic spine surgery patients who may benefit from ketamine
- Development of patient-specific pain treatment plans
- Interdisciplinary communication and collaboration
Reinfusion & Next Steps

- Re-infusion of staff education for all adult inpatient areas caring for patients with ketamine infusions
- Integrated BestPractice Advisory into electronic medical record to identify opioid-tolerant patients pre-operatively to consider development of pain treatment plans
  - All orthopedic patients
  - Abdominal GI oncology surgery patients

Iowa Model (cont.)

Dissemination

- Oral presentations
  - Advanced Practice Institute: Promoting Adoption of EBP
  - Nursing Safety Grand Rounds
  - STTI International Research Congress
  - Nursing Practice/Research Conference – Univ of Chicago
- Poster presentation
  - National EBP Conference
- Manuscript (in press JoPAN)
Use of Low-Dose Ketamine to Treat Post-Op Pain – An EBP Exemplar
Allison Hanson, BSN, RN
Michele Farrington, BSN, RN, CPHON
Trudy Laffoon, MA, RN-BC
Anne Smith, MSN, RN-BC

Questions/Comments

References