Effects of Therapeutic Music on Pain in Spinal Surgery Recovery  
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**Background**
- More than 80% of postoperative patients report moderate to severe pain (Whitaker, 2010)
- Therapeutic music effectively reduces pain when used with opioid medication (Lin et al., 2011)
- Music works by gate control theory. Introducing an alternate stimulus like music interrupts the pain signal along the pathway (Vaajoki et al., 2011)
- Music causes changes in brain found on fMRI & PET scans (Salimpoor et al., 2011)

**PICOT**
- Do adult postoperative spinal patients, who use therapeutic music on postoperative day four, report reduced pain scores and require less opioid medication at a small Midwest hospital?

**Review of Literature**
- **Key Terms:** music, postoperative, pain, surg*
- **Limiters:** 2010-2016, English, scholarly peer reviewed
- **Inclusion Criteria:** >18 y/o, spinal surgery, abdominal surgery, joint surgery, therapeutic music
- **Exclusion Criteria:** Cardiovascular surgery, gynecological surgery, therapeutic music not used for pain

**Literature Search Results**

<table>
<thead>
<tr>
<th>Database</th>
<th>Articles Found</th>
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**Synthesis of Evidence**
- Use of therapeutic music consistently shows reductions in postoperative pain and opioid medication usage when used in combination with analgesic medications.
- Evidence shows good quality with significant results in a multitude of surgeries including abdominal, spinal, and joint replacement.
- Music is effective in reducing anxiety, normalizing physiologic parameters, increasing patient satisfaction, and improving mobility

**Table 1 Evidence**

<table>
<thead>
<tr>
<th>Level of Evidence</th>
<th>Design of Evidence</th>
<th>Included</th>
<th>Quality Grade</th>
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<tr>
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<td>2</td>
<td>RCT Designs</td>
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<td>A (2), B (0), C (0)</td>
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<td>Controlled Trails, Quasi-Experimental Designs</td>
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**Level:** Hierarchy of Evidence (Melnyk & Finepout-Overhualt, 2005)  
**Quality:** John Hopkins Evidence Based Practice tool (JHNEBP) H = High, G = Good, L = Low

**Decision to Change Practice**
- Therapeutic music is effective in the hospital setting (Hole et al., 2015)
- Therapeutic music is cost effective with no side effects and requires no training of staff (Alred et al., 2010; Economidiou et al., 2012; Good et al., 2010; McCaffrey & Locsin, 2006)
- Inpatient rooms have access to internet music stations
- Therapeutic music is a patient driven therapy
- Nurses and patients can easily manage this therapy

**Implementation**

**Participants and Setting**
- All patients ≥ 18 y/o presenting for spinal surgery with anticipated hospital stay > 4 days
- Small hospital in Northwest Indiana

**Theoretical Framework:** Watson’s Theory of Transpersonal Caring

**Evidence Based Practice Model:** Evidence-Based Medicine Model (steps listed below)
- Identify clinical question
- Finding and appraising the evidence
- Applying the evidence
  - Develop therapeutic music protocol
  - Educate in patient staff/promote policy change
  - Weekly EMR chart audits/contact with nursing staff
- Evaluate performance

**Time:** September 1st through December 21st

**Evaluation**
- Recruited (n = 39), Day 3 (n = 36), Day 4 (n = 26)
- Age, Gender, Race, Religious affiliation, Work status, Marriage Status, Smoking Status
  - Gender: 14 Males, 12 Females
  - Race: 23 Caucasian, 2 Hispanic, 1 African American
  - Age: 33-69 (M = 51.69, SD = 9.87)
  - Religious: 11 affiliated, 15 not affiliated
  - Work: 12 employed, 6 unemployed, 8 retired
  - Marriage status: 17 married, 9 not married
  - Smoking: 13 current, 9 never smoked, 4 former
- Pain scores, Opioid medication (mg of morphine), BP, Pulse, RR, Temperature
  - Paired t-test, Pearson r correlation
  - Compare day 3 and 4
  - Time intervals (0700-1500, 1501-2300, 2301-0700)

**Outcomes**
- **Primary:**
  - Statistically significant decrease in pain scores
  - Day 3 time interval 1/ day 4 time interval 1 (t = 2.516, p < .05)
  - Day 3 time interval 2/ day 4 time interval 2 (t = 2.590, p < .05)
  - Clinical significance decrease pain scores
  - (r = .813, p < .001; r = .667, p < .001; r = .539, p < .01 respectively)
  - Opioid medication (r = .857, p < .001; r = .456, p < .05; r = .864, p < .01 respectively)

**Secondary:**
- Pulse rate (r = .857, p < .001; r = .456, p < .05; r = .864, p < .01 respectively)

**Figure 1: Pain Scores Trends Day 3 and 4**

**Figure 2: Opioid Medication Usage (mg) Day 3 and 4**

**Conclusions**
- This EBP project succeeded in producing a protocol that implemented therapeutic music into the postoperative process, which significantly reduced pain and opioid medication use as described in the literature analysis.
- The results of this EBP project also indicate the need and effectiveness of regular use of CAM therapies during the postoperative process.

**Recommendations**
- **Practice**
  - Expansion of this therapeutic music protocol to include the entire perioperative process is the next step
- **Research**
  - Replicable data is needed for inpatient therapeutic music protocols.
- **Education**
  - Staff and patients need to be educated at the effectiveness and procedure of incorporating therapeutic music routinely

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