Music Therapy: A Complementary and Alternative Modality for the reduction of Perioperative anxiety

Thinking Outside of the Box

Bernard L Nichols III, MSN, RN, CCRN
Low cost non-pharmacological intervention reported to reduce perioperative:
- Anxiety
- Pain
- Possibly recovery times
  (Bradt, Dileo, & Shim, 2013; Johnson, Raymond, & Goss, 2012)

One large study found music therapy more effective than Midazolam in reducing pre-operative anxiety and equally effective in the reduction of physiological responses of anxiety. (Bradt, Dileo, & Shim, 2013)

Several recent studies point out that music therapy decreases the sympathetic nervous system responses and increases the activation of the parasympathetic nervous system resulting in a reduction of anxiety and a sense of relaxation.
  (Thompson, Moe, & Lewis, 2014; Lee, Chao, Yiin, Chiang, & Chao, 2011; Palmer, Lane, Mayo, Schluchter, & Leeming, 2015)

Introduction - Music Therapy
• Enhanced Patient Experience (EPE)
  – Reduce patient stays without reducing patient satisfaction scores.
  – EPE recovery time goal: ≤ 60 min.

• Anxiety must be treated: untreated anxiety can increase anesthetic requirements which may lead to recovery complications. (Ni, Tsai, Lee, Kao, & Chen, 2012)

  – Barriers
    • Pre-op Anxiolytic – Midazolam reported to delay recovery time. (Binns-Turner, Wilson, Pryor, Boyd, & Prickett, 2011)
    • SYB ASC has reduced Midazolam use but is still not meeting recovery time goal of ≤ 60 min.

• This was an opportunity to consider a complementary and alternative modality (CAM) like music therapy.

Clinical Issue
Population: In adult ambulatory surgery patients,
Intervention: how does implementing music therapy,
Comparison: compared to anxiolytic medications alone,
Outcome: affect patient anxiety, pain, satisfaction scores,
recovery times, and healthcare costs?

Question (PICO)
Electronic Searches and Terms:

• The Cochrane Library: Surgery patients, Music Therapy, Anxiety
  – 4 results

• PubMed: Surgery patients, Music therapy, Anxiety, Satisfaction
  – 36 results

• CINAHL: Surgery patients, Music therapy, Anxiety
  – 13 results

Search Strategy
<table>
<thead>
<tr>
<th>Article</th>
<th>Type</th>
<th>Sample</th>
<th>Intervention</th>
<th>Outcome</th>
<th>Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bradt, et al. (2013)</td>
<td>Systematic review</td>
<td>26 RCT's</td>
<td>Listening to pre-recorded music in preoperative unit</td>
<td>Anxiety</td>
<td>I</td>
</tr>
<tr>
<td>Music interventions for preoperative anxiety</td>
<td>Meta-analysis (Cochrane)</td>
<td></td>
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<tr>
<td>Hole, et al. (2015)</td>
<td>Systematic review</td>
<td>72 RCT's</td>
<td>Any form of music initiated before, during, or after surgery</td>
<td>Anxiety, Pain, Satisfaction</td>
<td>I</td>
</tr>
<tr>
<td>Music as an aid for postoperative recovery in adults</td>
<td>Meta-analysis (Lancet)</td>
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</tbody>
</table>
The therapy could last 30-40 min in the pre-operative unit but it has been reported to be effective intraoperative as well with reductions in BIS index scores (Bae, Lim, Hur, & Lee, 2014).


Evidence: Meta-analysis
## State Anxiety (STAI)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Music</th>
<th>N</th>
<th>Mean (SD)</th>
<th>Control</th>
<th>N</th>
<th>Mean (SD)</th>
<th>Mean Difference</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Personal Vision 2008</td>
<td>32</td>
<td>23.18 (8.83)</td>
<td>32</td>
<td>44.42 (9.42)</td>
<td>-11.24</td>
<td>7.4%</td>
<td>-16.75 [-15.31, -18.19]</td>
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<tr>
<td></td>
<td>August 1994</td>
<td>21</td>
<td>22.98 (8.30)</td>
<td>21</td>
<td>44.94 (7.52)</td>
<td>-21.96</td>
<td>4.3%</td>
<td>-3.98 [-2.03, -5.93]</td>
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<tr>
<td></td>
<td>Cassetty 2003</td>
<td>16</td>
<td>29.95 (9.39)</td>
<td>16</td>
<td>37.62 (9.82)</td>
<td>-7.67</td>
<td>3.0%</td>
<td>-1.82 [-0.77, -2.87]</td>
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<td></td>
<td>Coyle 2005</td>
<td>50</td>
<td>29.95 (9.32)</td>
<td>50</td>
<td>52.55 (8.60)</td>
<td>-22.60</td>
<td>5.4%</td>
<td>-5.25 [-8.99, -1.51]</td>
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<tr>
<td></td>
<td>DeMarco 2012</td>
<td>14</td>
<td>17.7 (5.33)</td>
<td>14</td>
<td>20.1 (2.39)</td>
<td>-2.4</td>
<td>2.7%</td>
<td>-7.66 [-16.44, 1.24]</td>
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<tr>
<td></td>
<td>Cue 2005</td>
<td>46</td>
<td>16.6 (7.94)</td>
<td>46</td>
<td>24.47 (5.70)</td>
<td>-7.87</td>
<td>10.0%</td>
<td>-7.47 [-11.36, -3.58]</td>
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<td></td>
<td>Lax 2004</td>
<td>50</td>
<td>42.5 (7.51)</td>
<td>50</td>
<td>42.5 (7.51)</td>
<td>0.0</td>
<td>14.4%</td>
<td>-3.91 [-6.16, -1.64]</td>
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<td></td>
<td>Wolken 2002</td>
<td>45</td>
<td>40.2 (7.30)</td>
<td>45</td>
<td>50.7 (4.1)</td>
<td>-10.5</td>
<td>5.3%</td>
<td>-10.1 [-12.86, -7.34]</td>
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<td></td>
<td>Nai 2001</td>
<td>86</td>
<td>50.5 (2.39)</td>
<td>86</td>
<td>2.0 (1.2)</td>
<td>-28.5</td>
<td>15.6%</td>
<td>-4.21 [-6.35, -2.07]</td>
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<td></td>
<td>Saxe 1995</td>
<td>6</td>
<td>4.5 (3.29)</td>
<td>6</td>
<td>6.2 (2.98)</td>
<td>1.7</td>
<td>3.0%</td>
<td>-1.5 [-3.04, 0.00]</td>
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<tr>
<td></td>
<td>Winter 1994</td>
<td>31</td>
<td>29.51 (8.49)</td>
<td>31</td>
<td>36.1 (9.09)</td>
<td>-6.6</td>
<td>4.4%</td>
<td>-6.6 [-16.16, 3.04]</td>
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<tr>
<td></td>
<td>Yong 2002</td>
<td>10</td>
<td>1.0 (0.2)</td>
<td>10</td>
<td>0.5 (1.2)</td>
<td>0.5</td>
<td>4.6%</td>
<td>-0.40 [-0.80, 0.00]</td>
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<td></td>
<td>Yong 2003</td>
<td>33</td>
<td>35.57 (5.05)</td>
<td>33</td>
<td>39.31 (4.74)</td>
<td>-3.74</td>
<td>10.4%</td>
<td>-3.74 [-7.55, -0.05]</td>
</tr>
</tbody>
</table>

**Subtotal (95% CI):** -43.0 [-7.23, -4.37] 100.0% (II: 0.001; P: 0.00001)

2 Adequate randomization
- Coyle 2005: 46 4.05 (7.54) 46 42.47 (5.70) -57.44 24.5% -7.47 [-11.36, -3.58]
- Wolken 2002: 45 40.2 (7.30) 45 50.7 (4.1) -10.5 5.3% -10.1 [-12.86, -7.34]

**Subtotal (95% CI):** -22.5 [-9.0, -3.5] 100.0% (II: 0.001; P: 0.00001)

## Anxiety (non-STAI)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Music</th>
<th>N</th>
<th>Mean (SD)</th>
<th>Control</th>
<th>N</th>
<th>Mean (SD)</th>
<th>Mean Difference</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Boston 1994</td>
<td>32</td>
<td>0.59 (0.92)</td>
<td>32</td>
<td>1.36 (0.82)</td>
<td>-0.77</td>
<td>13.9%</td>
<td>-0.93 [-1.45, -0.40]</td>
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<tr>
<td></td>
<td>Galvez 1995</td>
<td>16</td>
<td>2.90 (0.56)</td>
<td>16</td>
<td>3.92 (0.28)</td>
<td>-1.02</td>
<td>10.2%</td>
<td>-0.32 [-1.05, 0.39]</td>
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<tr>
<td></td>
<td>Galvez 2005</td>
<td>21</td>
<td>6.1 (0.7)</td>
<td>21</td>
<td>65.2 (2.2)</td>
<td>-59.1</td>
<td>13.2%</td>
<td>-0.15 [-1.75, 0.40]</td>
</tr>
<tr>
<td></td>
<td>Lex 2001</td>
<td>46</td>
<td>5.2 (0.7)</td>
<td>46</td>
<td>62.2 (2.2)</td>
<td>-57.0</td>
<td>17.0%</td>
<td>-5.58 [-6.68, -4.48]</td>
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<tr>
<td></td>
<td>Lex 2002</td>
<td>76</td>
<td>2.0 (2.3)</td>
<td>76</td>
<td>3.3 (2.4)</td>
<td>-1.3</td>
<td>18.7%</td>
<td>-0.21 [-1.65, 1.22]</td>
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<td>Li 2004</td>
<td>30</td>
<td>13.7 (5.5)</td>
<td>30</td>
<td>17.9 (6.7)</td>
<td>-4.2</td>
<td>13.6%</td>
<td>-0.99 [-1.49, -0.49]</td>
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<tr>
<td></td>
<td>Lin 2001</td>
<td>30</td>
<td>2.0 (0.7)</td>
<td>30</td>
<td>4.9 (2.8)</td>
<td>-2.9</td>
<td>13.3%</td>
<td>-1.06 [-1.77, -0.31]</td>
</tr>
</tbody>
</table>

**Subtotal (95% CI):** 257 247 100.0% (II: 0.001; P: 0.00001)

2 Adequate randomization
- Boston 1994: 32 0.59 (0.92) 32 1.36 (0.82) -0.77 13.9% -0.93 [-1.45, -0.40]
- Galvez 1995: 16 2.90 (0.56) 16 3.56 (0.28) -0.66 10.2% -0.32 [-1.05, 0.39]
- Galvez 2005: 16 6.1 (0.7) 21 65.2 (2.2) -59.1 13.2% -0.15 [-1.75, 0.40]

**Subtotal (95% CI):** 169 93 100.0% (II: 0.001; P: 0.00001)

### Evidence: Meta-analysis

Cochrane Database of Systematic Reviews
6 JUN 2013 DOI: 10.1002/14651858.CD006908.pub2
• Music should be offered to help reduce preoperative anxiety, postoperative pain, increase patient satisfaction and possibly reduce recovery times.

• Outcomes to be measured
  – Anxiety
  – Pain
  – Patient Satisfaction CAHPS Survey Scores
  – Arrival in PACU to readiness to D/C time
    • Ready to D/C is defined as:
      – Phase II
      – Ready to get dressed. (stable)
Population to begin trial: Breast Reconstruction

- These patients experience high levels of stress R/T:
  - Cancer diagnosis
  - Treatment options
  - Body image
  - Future prognosis
  - Potential mortality

  (Binns-Turner, Wilson, Pryor, Boyd, & Prickett, 2011)

Music (offered in Pre-op)

- 4-6 pre-recorded genres

- Soothing (60-80 beats/min)

- Non-lyrical

- Disposable *noise blocking* Ear buds or Headphones

- Low volume (<70dB)

- 5-30 minute session

(Binns-Turner, Wilson, Pryor, Boyd, & Prickett, 2011)

(Lee, Chao, Yiin, Chiang, & Chao, 2011)

- Patient Satisfaction CAHPS Survey Scores
  - Collect from QI

- Data collected from the Epic EMR flowsheets
  - Pain
    - pain assessments from admit, or baseline, to D/C
  - PACU to readiness to D/C times
    - Case tracking
  - Anxiety (establish a 60 day baseline)
    - Document in Coping Group - Anxious
    - Anxiety groups added to flowsheets
      - Anxiety: feeling nervous – 1 to 10 scale
        - Developed and validated by Benotsch (r=0.77)
          (Johnson, B., Raymond, S., & Goss, J., 2012)
      - Anxiety: Promote reduction - Music therapy
Data Collection - Document in Coping Row - Anxious
Data Collection – Add Row - **Anxiety**: feeling **Nervous**

Developed and validated by Benotsch (r=0.77)

(Johnson, B., Raymond, S., & Goss, J., 2012)
Data Collection – Add Group - Anxiety: Promote Reduction
Data Collection
• Data was collected through chart review:

• Data was collected for 60 days for both Control and Intervention groups.

• Data collected was trended and graphed to identify potential differences in dependent variables.

Data Collection
• Preliminary data results suggested that 93% of the Intervention Group experienced a reduction of anxiety.

How much of a reduction?
Outcomes

**PAIN**
- Control: 0.80
- Music: 0.38

**ANXIETY**
- Control: 2.12
- Music: 3.45

**READY TO DISCHARGE TIME**
- Control: 0.50
- Music: 0.51


References


Zborowsky, T., & Kreitzer, M. J. (2014). Creating optimal healing environments. In M. J. Kreitzer, & M. Koithan (Eds.), *Integrative Nursing* (pp. 84-100). New York: Oxford University Press.

References
<table>
<thead>
<tr>
<th></th>
<th>Effect Size (95% CI)</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall pain score</td>
<td>-0.77 (-0.99 to -0.56)</td>
<td>90</td>
</tr>
<tr>
<td>Overall analgesia use</td>
<td>-0.37 (-0.54 to -0.20)</td>
<td>75</td>
</tr>
<tr>
<td>Overall anxiety</td>
<td>-0.68 (-0.95 to -0.41)</td>
<td>92</td>
</tr>
<tr>
<td><strong>Timing of music delivery on pain</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preoperative</td>
<td>-1.28 (-2.03 to -0.54)</td>
<td>94</td>
</tr>
<tr>
<td>Intraoperative</td>
<td>-0.89 (-1.20 to -0.57)</td>
<td>92</td>
</tr>
<tr>
<td>Postoperative</td>
<td>-0.71 (-1.03 to -0.39)</td>
<td>87</td>
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<tr>
<td><strong>Timing of music delivery on analgesia use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preoperative</td>
<td>-0.43 (-0.67 to -0.20)</td>
<td>4</td>
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<tr>
<td>Intraoperative</td>
<td>-0.41 (-0.70 to -0.12)</td>
<td>84</td>
</tr>
<tr>
<td>Postoperative</td>
<td>-0.27 (-0.45 to -0.09)</td>
<td>40</td>
</tr>
<tr>
<td><strong>Timing of music delivery on anxiety</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preoperative</td>
<td>-1.12 (-2.05 to -0.19)</td>
<td>95</td>
</tr>
<tr>
<td>Intraoperative</td>
<td>-0.83 (-1.19 to -0.47)</td>
<td>93</td>
</tr>
<tr>
<td>Postoperative</td>
<td>-0.50 (-0.96 to -0.04)</td>
<td>88</td>
</tr>
</tbody>
</table>

Note: The diagrams show the direction of effect with arrows indicating whether music favours music or control conditions.
Patient satisfaction

1.09 (0.51 to 1.68)

Favours control  Favours music

93
<table>
<thead>
<tr>
<th>Qty</th>
<th>1-124</th>
<th>125-249</th>
<th>250-499</th>
<th>500+</th>
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<tbody>
<tr>
<td>Per Piece</td>
<td>$1.40</td>
<td>$1.35</td>
<td>$1.31</td>
<td>$1.24</td>
</tr>
</tbody>
</table>

**Bright Colored Ear Buds**

Kaiser Permanente kp.org