Music Therapy in the Surgical Arena

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How Does Music Work?

- Auditory input is a **known modulator** of the human response to stress (Koch, Kain, Ayoub & Rosenbaum, 1998)

- Music **engages, stimulates** and is part of all **cultures** (Sloboda, 2002)

- Musical engagement (**focus of attention**) is **incompatible with anxiety** (psychological response). Music interventions are considered cognitive coping strategies.

- Music can serve as an **audio analgesic** (use of music to alleviate pain) and **anxiolytic** (relaxant/anxiety reducer)
Music and Pain

Music can be used to cognitively cope with pain. Music can facilitate:

• **1) Distraction of attention** (Pain is demanding of attention) (Baddeley, 1986)

• **2) Perceived control** (Brown, Chen, & Dworkin, 1989)

• **3) Emotional engagement** (Leventhal, 1992; Sloboda & Juslin, 2001)
Music alone and music assisted relaxation techniques have been shown to significantly decrease arousal (d = +.67) and increased relaxation when under an arousal condition due to stress (Pelletier, 2004)
Overall Effectiveness

• Overall effect size for music in medical/dental procedures is 1.17 with an increase to 1.40 for patient preferred music (Standley, 2000).

• For children and adolescents, the effect size is $d=.64$ (birth-21) and $d=.83$ for premature infants (Standley, 2002; Standley & Whipple, 2003)
Types of interventions

• Noninvasive music interventions are effective in managing anxiety and behavioral distress associated with the surgical experience.

• Interventions include:
  • Music listening
  • Music assisted relaxation
  • Music performance
  • Music combined with preoperative education
  • Music assisted ambulation
Primary Uses

- **Preoperatively**: (a) anxiety reduction, (b) increased relaxation, (c) mask ambient noise, (d) distraction

- **Intraoperatively**: (a) mask aversive sound stimuli, (b) distraction from surgical procedures, (c) influence pain perception

- **Postoperatively**: (a) promote relaxation, (b) decrease pain perception, (c) facilitate ambulation by providing support/motivation and relaxation/distraction
Preoperative use of music resulted in:

- Significant reductions in perceived levels of stress and anxiety (Cooke et al., 2005; Leardi et al., 2007; Wang, 2002; Winter et al., 1994; Wolfe & Waldon, 2009)

- Significantly lower HR and differences in BP and RR that approached significance (Augustin & Hains, 2006)

- Significantly greater reduction in anxiety when compared to midazolam (Bringman, Giesecke, Thorne & Bringman, 2009)

- Increased sedative effect of midazolam prior to surgery as reflected by lower BIS scores (Ganidagli et al., 2005)
Intraoperative use of music resulted in:

- Decreased sedative amounts in:
  - Awake patients (patient-controlled sedative/analgesic requirements) (Koch, 1998)
  - Spinal surgery patients under spinal anesthesia (Lepage et al., 2001)
  - Patients undergoing colonoscopy (Harikumar, 2006; Schiemann, Gross, Reuter & Kellner, 2002)

- Masked OR noises; facilitated teaching during cataract surgery (Gulledge & Kline, 1981)

- Less pain, less fatigue at discharge, and earlier sitting up in patients undergoing hysterectomy (Nilsson et al., 2001)

- Increased comfort, higher completion rates and shorter examination time for patients undergoing colonoscopy (Harikumar, 2006; Schiemann, Gross, Reuter & Kellner, 2002)

- Lowered BP, HR, RR in patients undergoing ophthalmic surgery (Camara, Ruszkowski, & Worak, 2008)
Postoperative use of music resulted in:

- Reduced pain and/or pain medication consumption (Bradt, 2001; Byers & Smith, 1997; Locsin, 1981; Nilsson et al., 2003; Nilsson, 2009; Siegel, 1983; Sendelbach et al., 2006)

- Reduced anxiety (Crago, 1980; Good et al., 2001; Mullooly, Levin & Feldman, 1988; Sendelbach et al., 2006)

- Mood elevation and increased perception of control (Bradt, 2001)

- Significant increases in oxytocin levels post open-heart surgery (Nilsson, 2009)

- Higher ready-to-ambulate scores (McCaffrey & Locsin, 2004; McCaffery, 2006)

- Higher cognitive scores and less confusion in older adults (McCaffery, 2009)

- Improved sleep (Lai & Good, 2005; Zimmerman et al., 1996)
General Considerations

• Recommendations state that hospital noise levels should not exceed 35-45 dBA (Woolfe & Waldon, 2009)

• Patient preferred music is most effective when dealing with pain; patient preferred music provides a sense of control and incorporates age, cultural background, musical experiences and familiarity

• Research selected music may be more effective when dealing with relaxation; patient preferred may be to stimulating. Repeated exposure to patient preferred music in a relaxation condition may decrease arousal, thereby increasing relaxation.

• Timing; music should begin approximately 30 minutes prior to the procedure

• Presentation; live vs. recorded and headphone considerations when using recorded music (Live music is more effective; allows for therapist-patient interaction and modulation)

• Dose; there is some evidence that higher doses of MT produce greater results