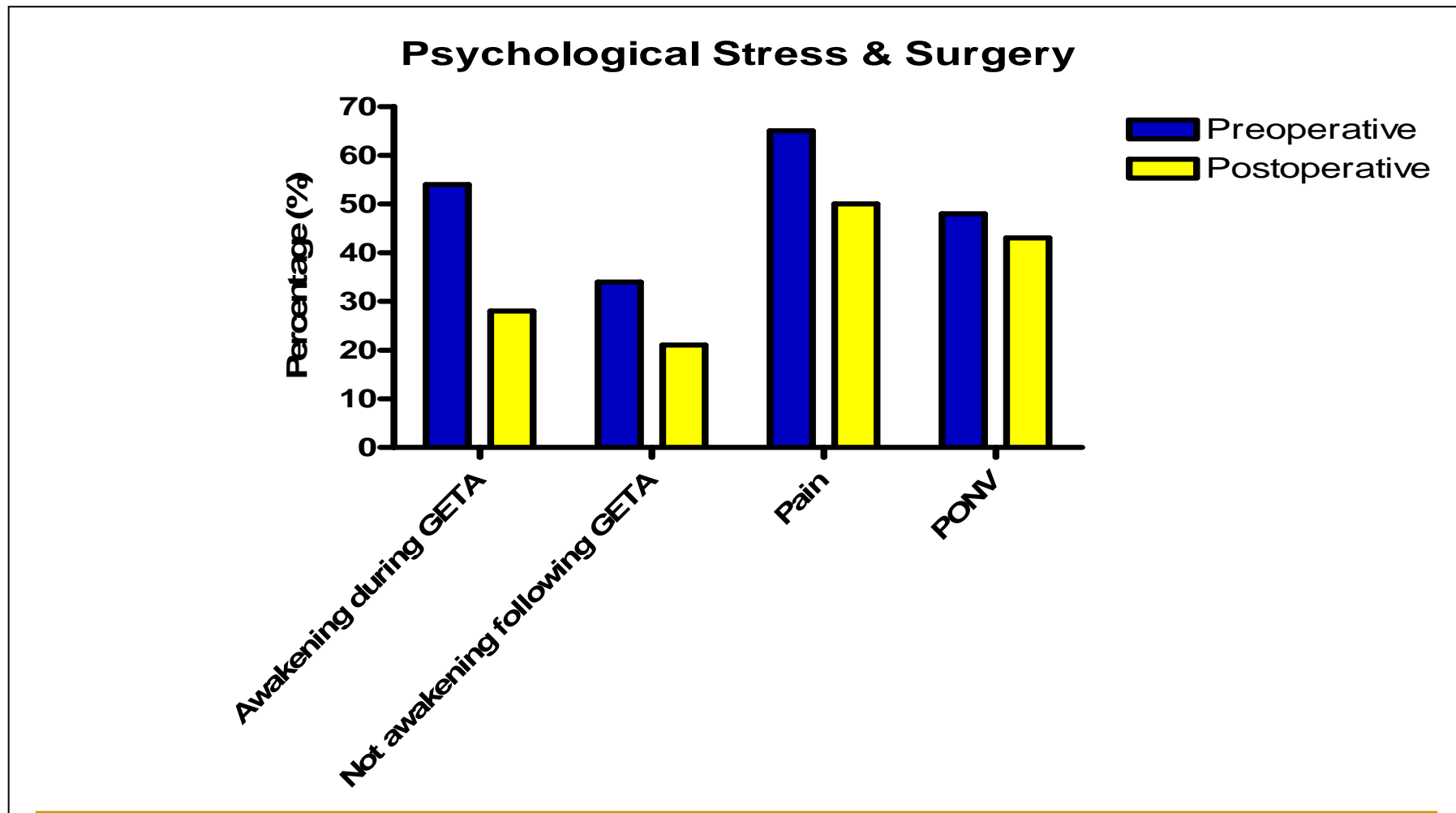

*Effect of Music Therapy & Therapeutic
Suggestion on General Anesthesia and
Postoperative Analgesic and Antiemetic
Outcomes*

Joseph E Pellegrini, CRNA, PhD

Psychological Stressors *(Patient Concerns)*



Traditional Methods used to Alay or Reduce the Risk of Stressors

- Preoperative interview
 - Anxiolytic Medications
 - BIS Monitoring
 - MAC Concentration
 - Preemptive Medication Treatment
 - Amnestic medication
 - Analgesic administration
 - Antiemetic administration
 - Alternative Therapy (*CAM*)
-

Complementary & Alternative Medicine (CAM)

- Traditional CAM employed in health care
 - Divided into pseudo invasive and pseudo non-invasive techniques
 - **Pseudo Invasive Techniques** *(Often requires specialized training & difficult to incorporate into practice)*
 - Acupuncture
 - Massage Therapy
 - Therapeutic Touch
 - Aromatic Therapy
 - **Pseudo Non-invasive Techniques**
 - Music Therapy
 - Guided Imagery *(using pre-packaged programs)*
 - Therapeutic Suggestion
 - *Can be used in conjunction with music therapy or solely to serve as a method of guided imagery*
-

Complementary & Alternative Medicine (CAM)

- Incorporation of complementary and alternative medicine (CAM) or therapies into the surgical setting has been slow
 - Evidence indicates that psychological distress has a detrimental effect on the preoperative, perioperative and postoperative analgesic & antiemetic requirements in the surgical patient
 - Using CAM typically involves a multidisciplinary approach
 - Not an alternative to surgery or anesthesia but a compliment that can be used in these disciplines
-

Music Therapy

*“Music hath charms to soothe the savage
beast, to soften rocks, or bend a knotted
pine”*

*William Congreve (1670-1729)
(The Mourning Bride, Act i. Sc. 1)*

Complementary & Alternative Medicine (CAM)

- Wide Variety of CAM modalities employed perioperative & postoperatively have been explored for prevention & treatment of Pain & PONV
 - Benefit found when perioperative music and/or therapeutic suggestions are used under GETA
 - Laurion S, Fetzer SJ. The effect of two nursing interventions on postoperative outcomes in gynecological laparoscopic patients. *J Perianesth Nurs* 18:254-61 2003
 - Benefit found when music used alone for prevention & treatment of PONV in PACU setting
 - Mamaril ME, Windle PE, Burkard JF. Prevention and management of postoperative nausea and vomiting: a look at complementary techniques *J Perianesth Nurs* 21:404-10 2006
 - Others have reported no benefit when therapeutic suggestions are used alone
 - Dawson P, Van Hamel C, Wilkinson D et al. Patient-controlled analgesia and intra-operative suggestion. *Anaes* 56: 1118-19. 2001
-

Music Therapy

- Music has well established psychological effects, including the induction & modification of moods & emotions
 - Music therapy is a treatment modality for dementia, stroke, Parkinson's disease, affective disorders and pain
 - Multiple studies performed on preoperative patients
 - Most centered in preoperative period
 - Few incorporated music perioperatively
 - Role in anesthetized patients unclear
 - Control groups usually exposed to “white noise”
 - Some indication that music and therapeutic suggestion coupled together beneficial
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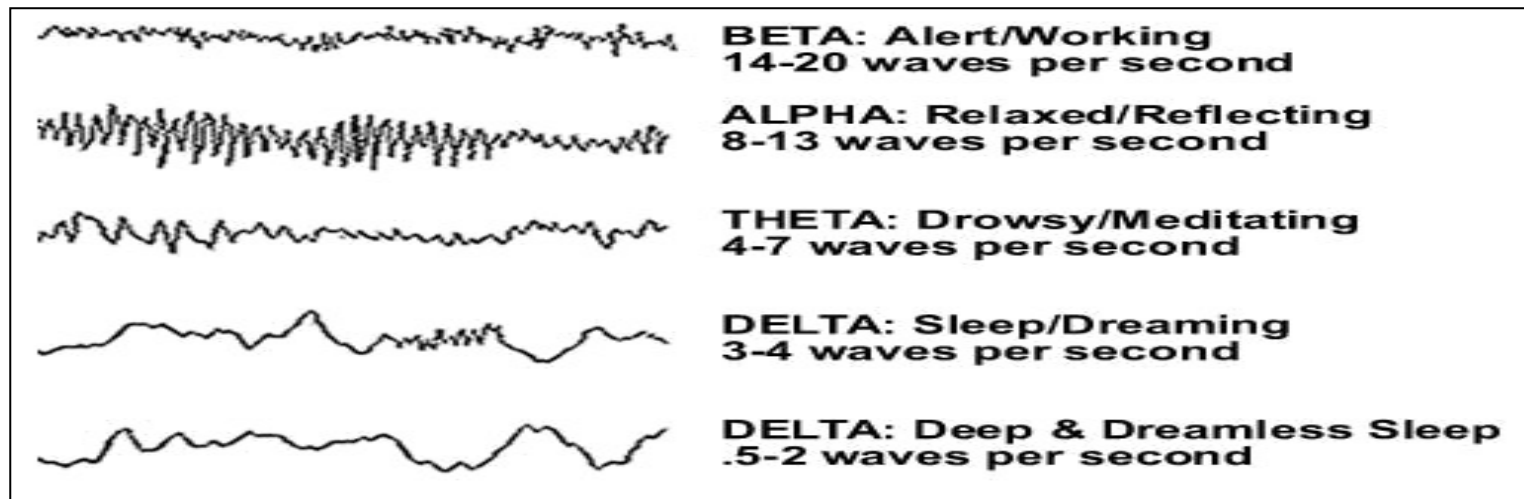
Music Therapy


- Patients preserve “implicit memory” during general anesthesia
 - Ghoneim MM, Block RI. *Anes* 1997; 87: 387-410
 - Sounds continue to be registered in an area of the cerebral cortex under general anesthesia
 - Casely-Rhondi et al. *Con Cog* 1994; 3: 166-95
 - Music therapy has been shown to reduce postoperative analgesic & antiemetic requirements and improve patient satisfaction in multiple studies
 - Standley JM. *J Mus Ther* 1986; 23: 56-122
 - Good MA. *Nur Res* 1995; 44: 52-57
 - Nilsson et al. *Anaesthesia* 2003; 58: 699-703
 - Stevens L et al. (*Unpublished*) 2007;
-

Music Therapy

- Music used in combination with anesthesia techniques has been shown to cause:
 - Hypo-metabolic response
 - ? Psycho physiologic response on Limbic System
 - Reduction in patients preoperative and postoperative anxiety scores
 - Overall reduction in perioperative and postoperative analgesic and antiemetic requirements
 - Increase in patient anesthesia satisfaction scores
-

Music Under General Anesthesia



- Music typically associated with *transporting the person from **BETA** to **THETA***
 - *Marketed music using “theta waves” (binaural beats)* 
- Increasing evidence that background music can be instrumental in helping solidify suggestions made to individual while in **DELTA** sleep
 - Predisposes a person to more strongly integrate therapeutic suggestions

Effect of Music on Hemodynamics, Pain & Stress

Psycho-Physiological Aspects

Music affects the Limbic System



Pulse, Blood Pressure and Breathing Rate

Pain Perception and Sensation

Music Reduces Stress Levels



- *Evokes Conditioned Relaxation*
- *Lowers Levels of the Cortisol Hormone*

Therapeutic Suggestion

- Reports that positive Therapeutic Suggestion presented to patients under GETA beneficial in reducing P/O complications
 - Information continues to be processed & registered in some areas of anesthetized brain
 - Therapeutic suggestions include pre-taped phrases verbalized by a certified hypnotherapist to suggest:
 - “I feel refreshed and relaxed”
 - “I will awaken without any feelings of nausea”
 - “I will awaken without pain”
 - “I am doing so good”
 - Some suggestion that frequent “coaching” by anesthetists during procedure using key TS phrases helpful in the absence of pre-taped TS
 - Encouragement phrases & phrases that support rehabilitation
-

Is Therapeutic Suggestion Alone Beneficial?

- **Benefit**

- Abramson M, Greefield I, Heron WT. Response to or perception of auditory stimuli under deep general anesthesia. *Am J Obstet Gynecol* 1968; 96: 584-585.
- Enqvist B, Von Konvow L, Bystedt H. Pre- and Perioperative suggestion in maxillofacial surgery: effects on blood loss and recovery. *Int J Clin Ext Hypn* 1995 Jul; 43: 284-294

- **VERSUS**

- **No Benefit**

- Van der Laan WH, Leeuwen BL, Sebel PS et al. Therapeutic suggestion has no effect on postoperative requirements. *Anal Analg* 1996; 82: 148-52.
-

Music Therapy & Therapeutic Suggestion

- Multiple studies have shown that both Music Therapy & Therapeutic Suggestion helpful in reducing P/O complications & speeding recovery
 - Some studies suggest that music alone more effective than using a combination of Music and TS in the immediate Postoperative period
 - Other studies suggest that using a combination therapy (M/TS) is more beneficial in reducing overall analgesic requirements & increasing time to analgesic & antiemetic requirements
 - Some studies report that TS is not effective but no well defined clinical trials have isolated out TS group alone
 - Recent study performed to determine if a difference could be determined if TS performed alone would be beneficial as compared to a group given M/TS or exposed to routine OR noises
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Improved recovery after music and therapeutic suggestions during general anaesthesia: a double-blind randomized controlled trial

Nilsson et al. *Anaesthesia* 2003; 58: 699-703

- Enrolled 90 ASA I-II hysterectomy patients to receive either Music (M), Music & Therapeutic Suggestion (M/TS) or taped OR noises (C-Control)
 - All subjects received a standardized general anesthesia induction and taped music & therapeutic suggestions prepared by an experienced hypotherapist
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Improved recovery after music and therapeutic suggestions during general anaesthesia: a double-blind randomized controlled trial

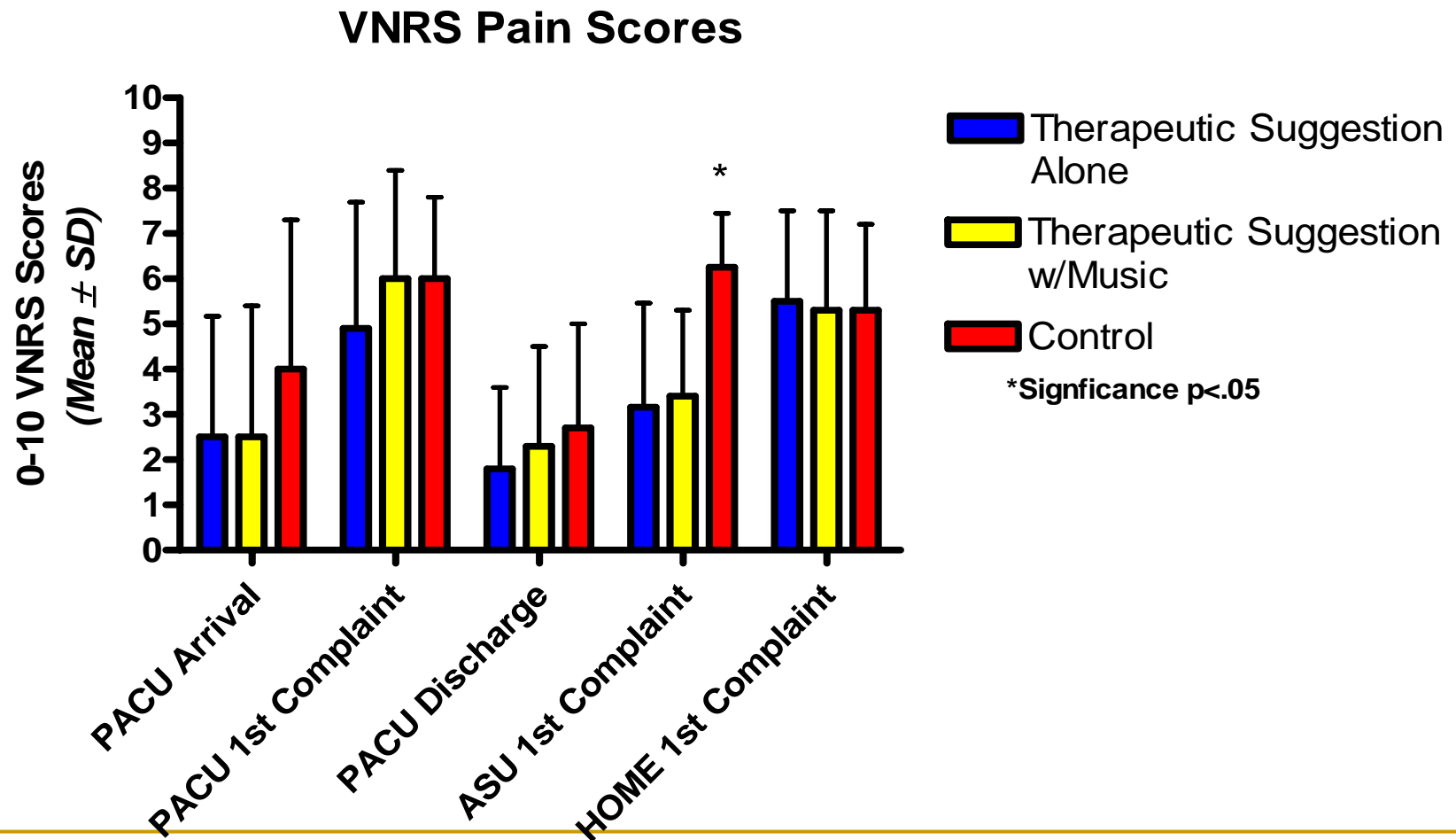
Nilsson et al. *Anaesthesia* 2003; 58: 699-703

- Reported that those subjects receiving music (M) alone & M/TS had lower overall analgesic requirements in the 1st 96 hours following surgery as compared to the Control group
 - Most apparent in 1st 24 hours
 - Those in the M/TS had similar analgesic requirements as the control group from 24-96 hours (*noted benefit of M alone between 0-24 hours*)
 - Questioned validity of inclusion of Therapeutic Suggestion
 - No differences in PONV between groups
 - Study had several limitations
 - Control group didn't mimic clinical OR sounds
 - No measurement of time to analgesic requests, PACU/ASU times & overall satisfaction
 - Didn't discuss when headphones were placed
 - Study performed in Sweden
 - Study designed to correct for these deficiencies and to mimic what is being done in clinical practice in United States
 - Isolated group that received TS alone included as separate group
 - To determine efficacy of TS because of controversy invoked by earlier studies
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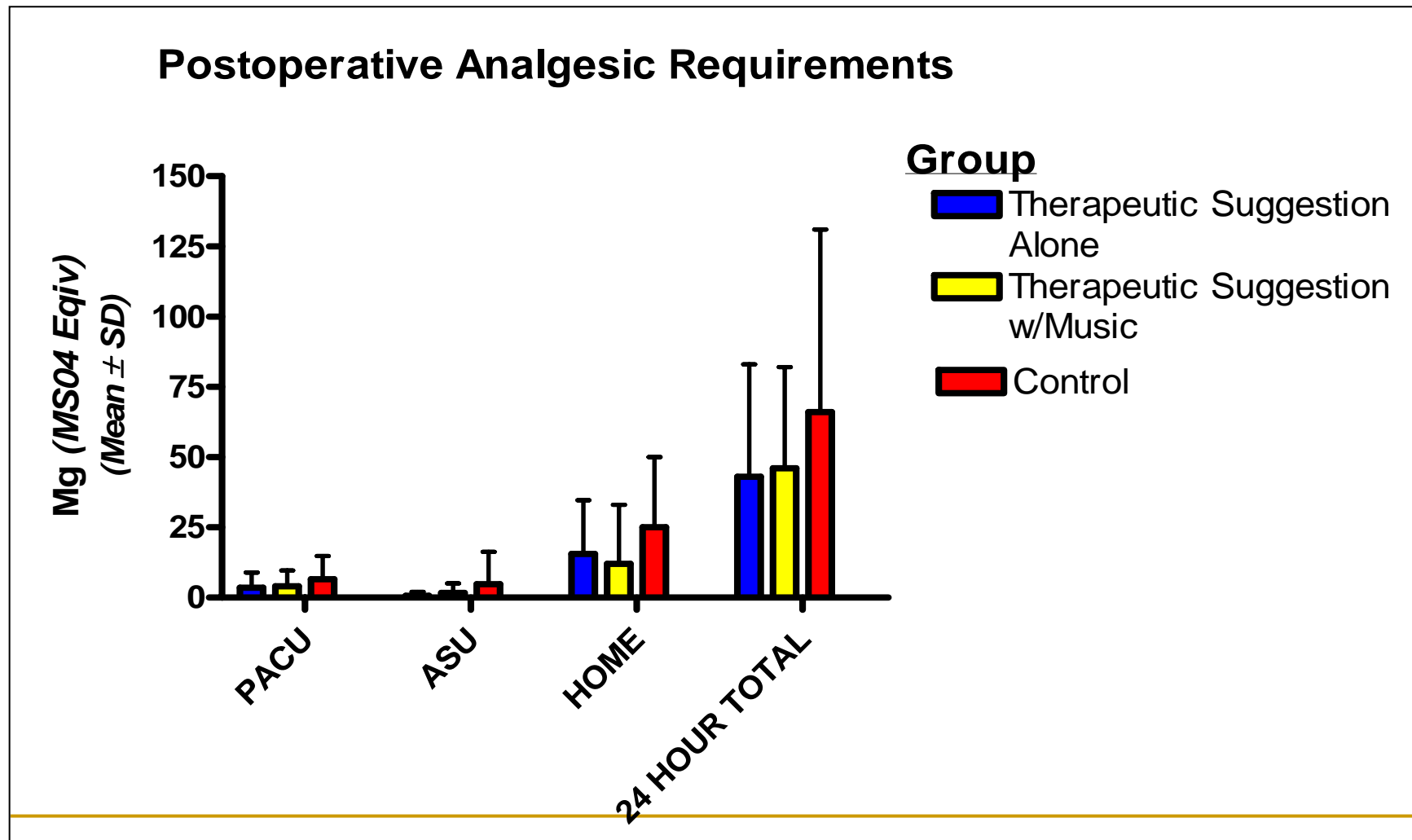
Stephens LL, Daniels J, Gargiulo R, Nezat G, Pellegrini JE. 2007. *Effect of Perioperative Music and Therapeutic Suggestion on Postoperative Outcomes.*

- 90 patients randomized to receive perioperative
 - Therapeutic Suggestion (TS) alone
 - Music with TS
 - Control – no intervention (*exposed to OR noises*)
 - Measured Variables Included:
 - Analgesic requirements
 - Preoperative, Perioperative, Postoperative
 - Time to 1st Request
 - Antiemetic requirements
 - Preoperative, Perioperative, Postoperative
 - Time to 1st Request
 - Overall Satisfaction
 - Anesthetic Experience
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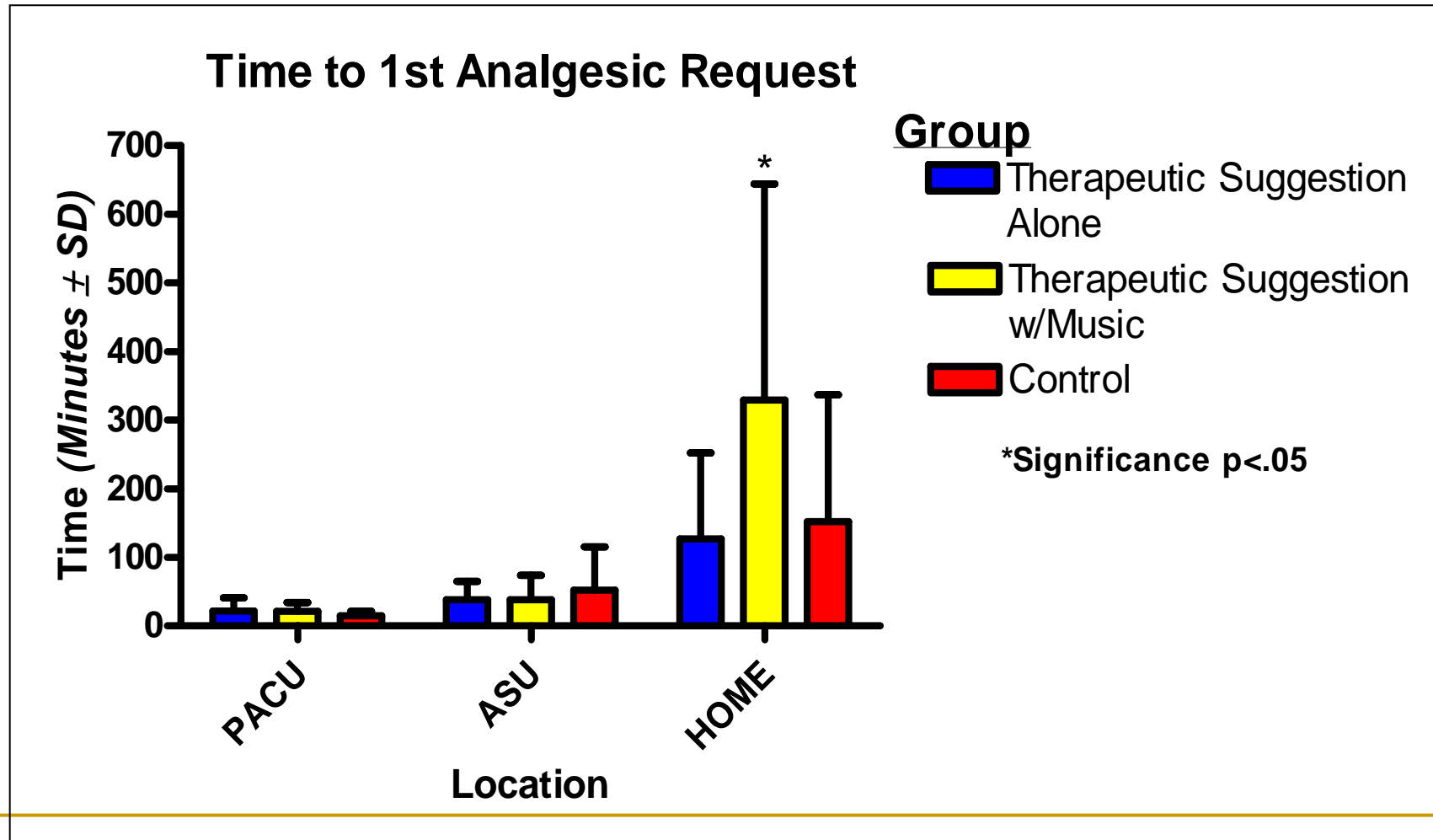
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Male

Time to First Analgesic Request (home)

TS Group: 56 ± 62 minutes

TS-Music Group: 169 ± 190 minutes

Control Group: 63 ± 108 minutes

Female

Time to First Analgesic Request (home)

TS Group: 100 ± 136 minutes

TS-Music Group: 261 ± 334 minutes

Control Group: 49 ± 61 minutes

*****Noted significantly reduced opioid requirements in all settings in TS and TS Music groups in Males but no difference in Females**

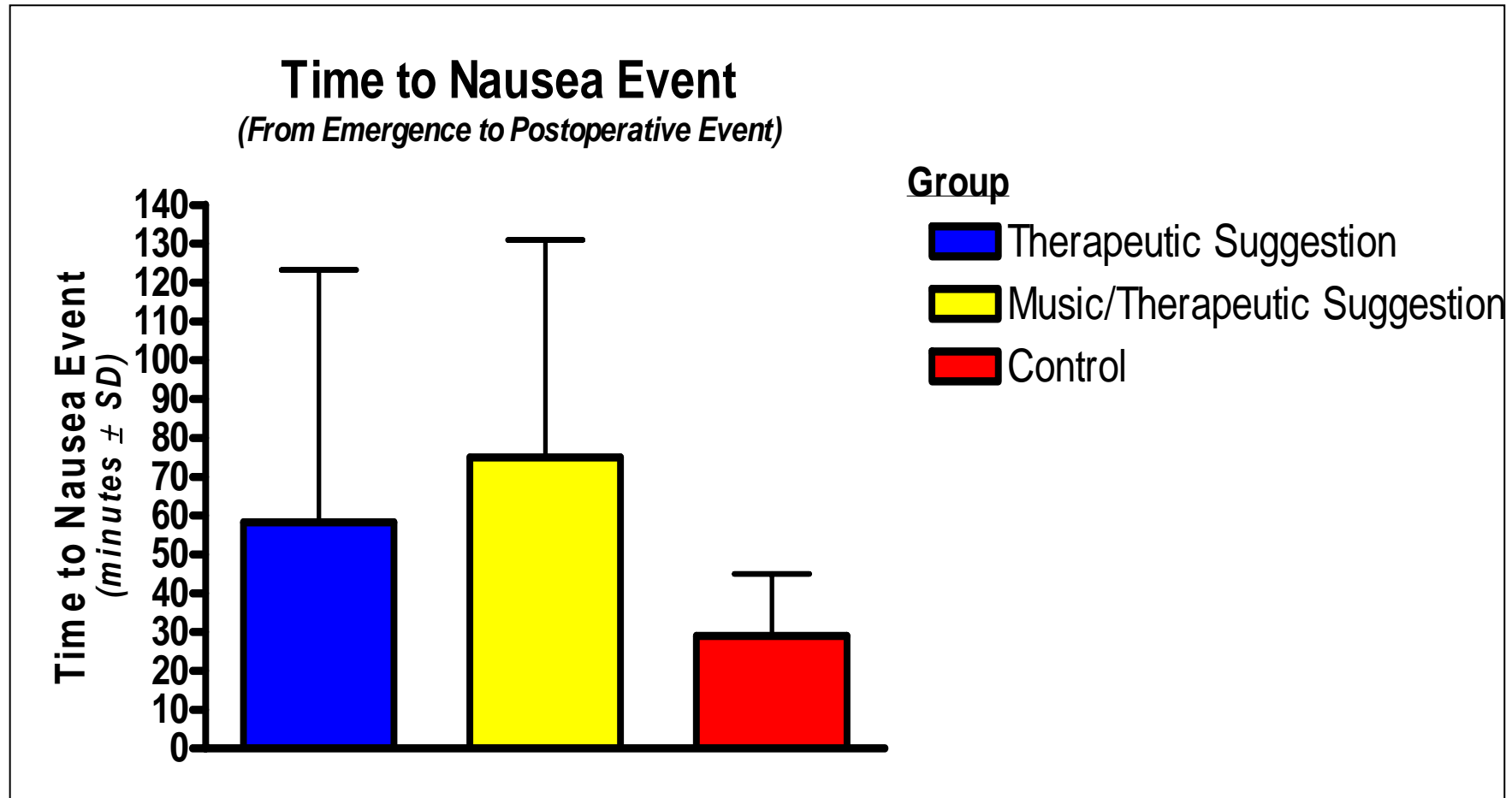
Stephens LL, Daniels J, Gargiulo R, Nezat G, Pellegrini JE. 2007. *Effect of Perioperative Music and Therapeutic Suggestion on Postoperative Outcomes.*

■ Findings

- ❑ Subjects in both intervention groups had less postoperative episodes of PONV
 - PACU incidence of PONV
 - ❑ 29% incidence in Control Group
 - ❑ 16% incidence in TS Group
 - ❑ 12% incidence in M/TS Group
 - Home complaints of PONV*
 - ❑ 25% incidence in Control Group
 - ❑ 11% incidence in TS Group
 - ❑ 20% incidence in M/TS Group

**Routine Postoperative Discharge Instructions include treatment of Home PONV with IPA self-administration*

Stephens LL, Daniels J, Gargiulo R, Nezat G, Pellegrini JE. 2007. *Effect of Perioperative Music and Therapeutic Suggestion on Postoperative Outcomes.*



Stephens LL, Daniels J, Gargiulo R, Nezat G, Pellegrini JE. 2007. *Effect of Perioperative Music and Therapeutic Suggestion on Postoperative Outcomes.*

□ Findings

- Decreased VNRS scores and Analgesic requirements but not statistically significant
 - Significant differences in time to 1st Postoperative Analgesic requirement in the M/TS group as compared to the Music or Control Group
 - Added benefit of TS
 - No differences in Overall Anesthesia Satisfaction Scores
 - All subjects reported good postoperative treatment of complications by medications administered in hospital or by self-administration of IPA
-

Effect of Music Therapy during Spinal Anesthesia

- Koch ME, Kain ZN, Ayoub C, Rosenbaum SH. The sedative and analgesic sparing effect of music. *Anes.* 1998; 89(2): 300-306.
 - Music decreased propofol and alfentanil requirements during MAC procedures
 - Increased overall satisfaction scores
 - Decreased Postoperative recovery profiles
 - Chang SC, Chen CH. Effects of music therapy on women's physiologic measures, anxiety, and satisfaction during cesarean delivery. *Res Nurs Health.* 2005; 28(6): 453-461.
 - Music patients more hemodynamically stable
 - More satisfied with cesarean experience
 - Lower overall anxiety scores
 - Definitive SAB study planned for Cesarean section population
 - *Enrollment planned for November 2008*
-

Using Complementary Medicine Interventions in the PACU

- **Laurion S, Fetzer SJ. The effect of two nursing interventions on the postoperative outcomes of gynecologic laparoscopic patients. *J Perianesth Nurs.* 2003; 18(4): 254-261**
 - Lower pain scores
 - Lower analgesic/antiemetic requirements

 - **Nilsson U, Rawal N, Enqvist B, Unosson M. Analgesia following music and therapeutic suggestions in the PACU in ambulatory surgery; a randomized controlled trial. *Acta Anaesth Scand.* 2003; 47(3): 278-283.**
 - Lower pain scores/analgesic requirements
 - Higher satisfaction scores
 - Earlier time to discharge

 - **Some suggestion that multiple Complementary Medicine Interventions may be more beneficial in PACU**
-

Music Therapy often used in combination with other CAM



Fig 2. The perianesthesia nurse is administering music therapy and aromatherapy of isopropyl alcohol to a PACU patient.

Discussion

- Patients retain the ability to cognate sounds while under General Anesthesia
 - Music Therapy & Therapeutic Suggestions beneficial in reducing overall analgesic and antiemetic requirements
 - Overall the combination of Music and Therapeutic Suggestion more beneficial than either modality used alone
 - Separate use beneficial
 - Choice of Music can be self-selected by patient or prescribed by provider
 - Taped Therapeutic Suggestion tapes by hypnotherapist with background soothing sounds (ocean breeze, waves etc) beneficial
 - Further research needed on whether provider TS during procedure is beneficial
 - Evidence indicates benefit
-

Discussion

- Use of CAM interventions easy to implement in most settings
 - Distinct advantage to Music and/or Music Therapeutic Suggestion placement after GETA induced in operative setting
 - Advantages to distraction therapy during regional anesthesia techniques
 - Strong evidence for worth in PACU setting used alone or in combination with other CAM techniques
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