



Mount
Sinai
Beth Israel

The Louis Armstrong Center for Music and Medicine

Integrating Music Therapy Practices into Wellness Models

Integrative Healthcare Symposium
NY Hilton Hotel

*Joanne Loewy DA, LCAT, MT-BC
The Louis Armstrong Center
for Music & Medicine
Icahn School of Medicine
New York, New York*

February 23, 2018



www.musicandmedicine.org



John Mondanaro



Andrew Rossetti



Jasmine Edwards



Joanne Loewy



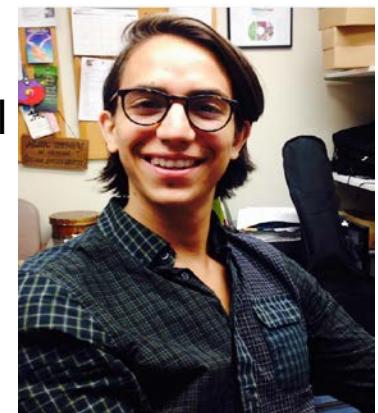
Marie Grippo



Stephan Quentzel



Shanay Johnson



Juan Robles-Gil Aleman



Mount
Sinai
Beth Israel

THE LOUIS ARMSTRONG CENTER FOR MUSIC & MEDICINE



Joanne Loewy DA, MT-BC, LCAT

Director, Louis Armstrong Center for Music and Medicine

Stephan Quentzel MD

Medical Director

John Mondanaro MA, MT-BC, LCAT, CCLS

Clinical Director

Juan Robles MA, LCAT, MT-BC

Oncology

Andrew Rossetti MMT, MT-BC

Radiation Oncology

Wen Chang MA, MT-BC, N-MT

Asthma & COPD Initiative Programs

Jasmine Edwards MA, MT-BC

NICU Music Therapy

Marie Grippo MA, Executive Assistant

12 graduate interns, 2 International Fellows,
2 Research Scholars, 4 Medical Students

www.musicandmedicine.org



MUSICAL

- Wellness
- Subjective response
- Intuitive learning / Clinical improvisation
 - Construction of meaning
 - Altered states of consciousness
- Physical / Emotional pain management through intervention from within

Transpiritual
Letting go / Holding on

Humanizing the
medical experience
Intimacy / Safety

MEDICAL MUSIC PSYCHOTHERAPY

Wholeness: Music identity
Integration of mind - body

Imagination / Transformation
Relinquishing Control / Relaxing
Retaining / Redefining self

- Physical pain treatment through intervention from without
 - Pharmacology
 - Measurement
- External knowledge / Prescribed regimen
 - Clinical objective
 - Illness

MEDICAL

Entrainment







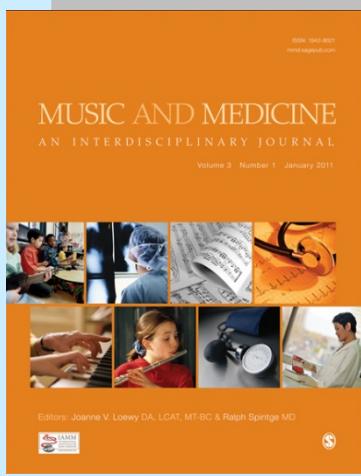
To join:

International Association for Music & Medicine

iammonline.com

IAMM 2018 Barcelona





MUSIC AND MEDICINE

Editors

Joanne V. Loewy, DA, LCAT, MT-BC

*The Louis Armstrong Center for Music and Medicine
Beth Israel Medical Center, New York, NY, U.S.A.*

Ralph Sprintge, MD

*Sportkrankenhaus Hellersen, Luedenscheid, Germany,
and the University for Music and Drama HfMT,
Hamburg, Germany*

Music and Medicine is a new international journal that offers an integrative forum for clinical practice & research of applied music in medical settings & allied institutions. Empirical research studies, clinical case reports, and applied models explicating theory and practice across the health, behavioral and neurosciences. Emphasis is placed on research practices that integrate music, music psychology, music cognition, music neurology, music therapy, and infant & early child development applied medical practice and knowledge. Research and clinical practices related to music psychotherapy and wellness practices is inclusive of the health of musicians. Methodology favor quantitative and qualitative research outcomes.

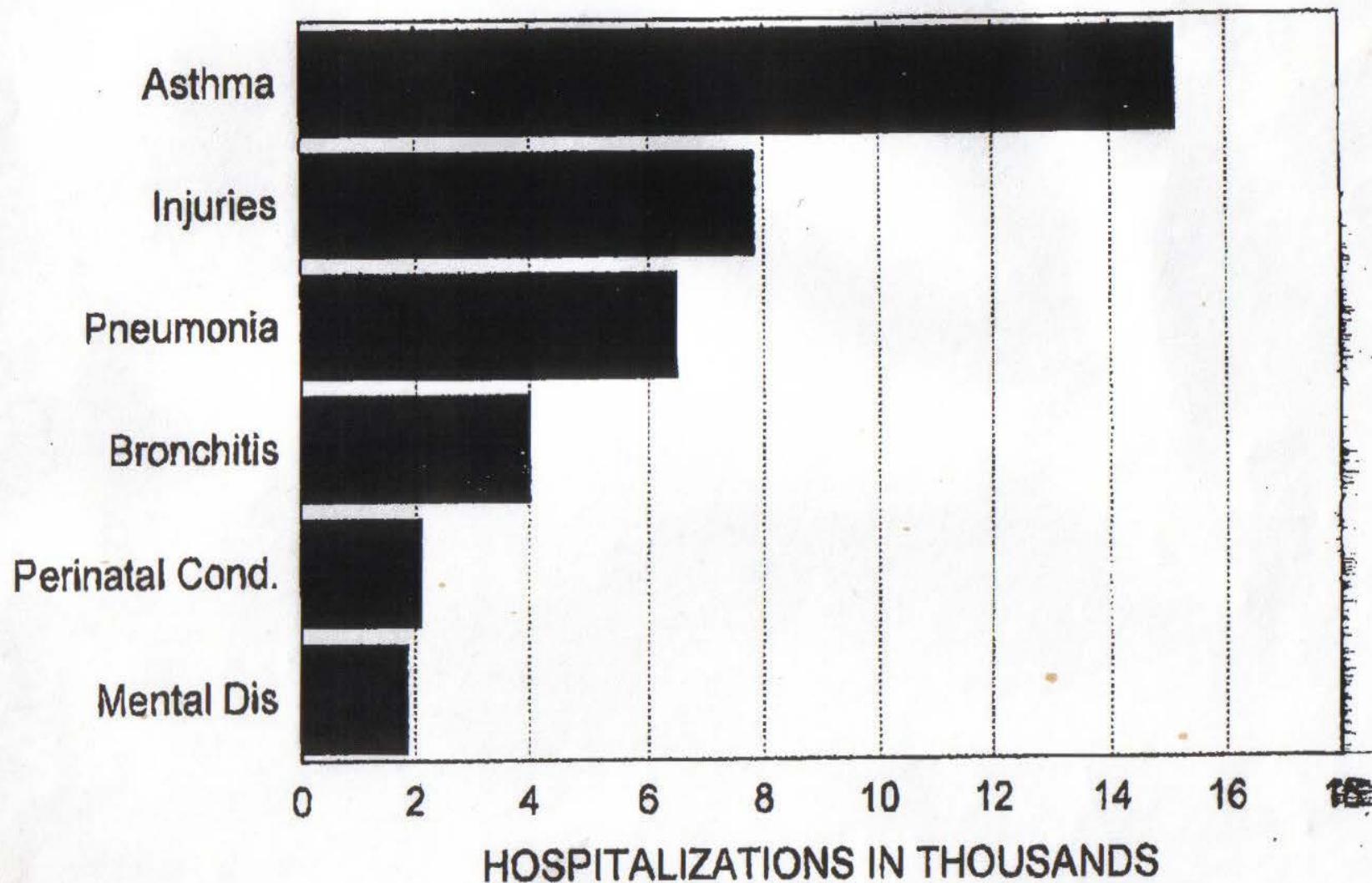
Topics include:

- ❖ Analgesia and Music Sedation
- ❖ Cancer Care: Active and Receptive Music Approaches
- ❖ Cardiology and Rhythm
- ❖ Clinical Improvisation in Health and Disease
- ❖ Dementia, Stroke and Music Memory
- ❖ Environmental ICU Music
- ❖ Infant Stimulation
- ❖ Medical Conditions and Treatment of Musicians
- ❖ Mood Disorders and Music Psychology
- ❖ Music in Transition: NICU, Hospice to End of Life
- ❖ Music in Surgery: Pre-op to post-op
- ❖ Music in Traumatic Response and Injury
- ❖ Neurologic Music Approaches
- ❖ Pain and Palliative Medical Music Strategies
- ❖ Psychosocial Music Interventions
- ❖ Respiratory Music Advances: Asthma, CF, COPD

TO SUBMIT:
iammonline.com/mmd



Leading Causes of Hospitalization Children ages 0-14: New York City 1996





Mount
Sinai
Beth Israel

Asthma Initiative Program (AIP)



The Asthma Initiative Program (AIP) uses music therapy to enhance the breathing capacity and quality of life of children and teens with asthma.

- AIP uses music-assisted relaxation and breathing exercises combined with playing a wind instrument to complement medical treatment. This unique, creative approach may help children to understand how to breathe optimally and maintain control over their symptoms.
- Enrollment in AIP music therapy study are children/teens 7-18. The research team is composed of music therapists, physicians, nurses and other medical staff. **200 patients-NYC public school, music, music plus, control-spirometry, journals, Juniper, Q of L**





2 Bi ONE

Sophia



THE LOUIS ARMSTRONG CENTER FOR MUSIC & MEDICINE



4 International Scholars, 4 Medical Students
www.musicandmedicine.org

Areas of Music Therapy Intervention: Fragile Environments



Emotional Trauma

State Anxiety

Depression / Mood Disorders

Emotional Needs

Spiritual Needs

Enhancing Quality of Life

Pain Management through various strategies

(Cognitive / Emotional, Release Oriented)

Temporal Distortion / Tension in waiting areas

Feelings of Loss— physical, psychosocial, existential

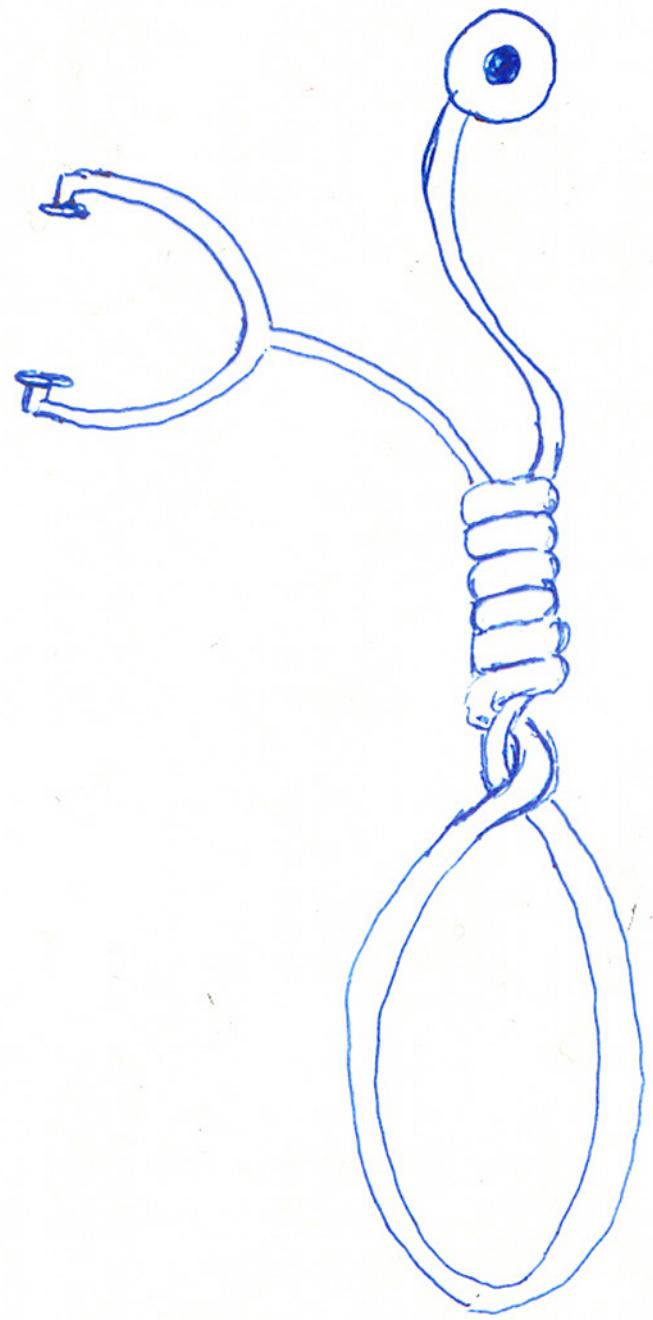


PROCEDURES, SIMULATION,
CHEMOTHERAPY, RADIATION-



The Hurting Stomach

By John Taylor





Beth Israel

Continuum Health Partners, Inc.





Interns and Research Fellows: US, Japan, China, Argentina, Spain and Greece

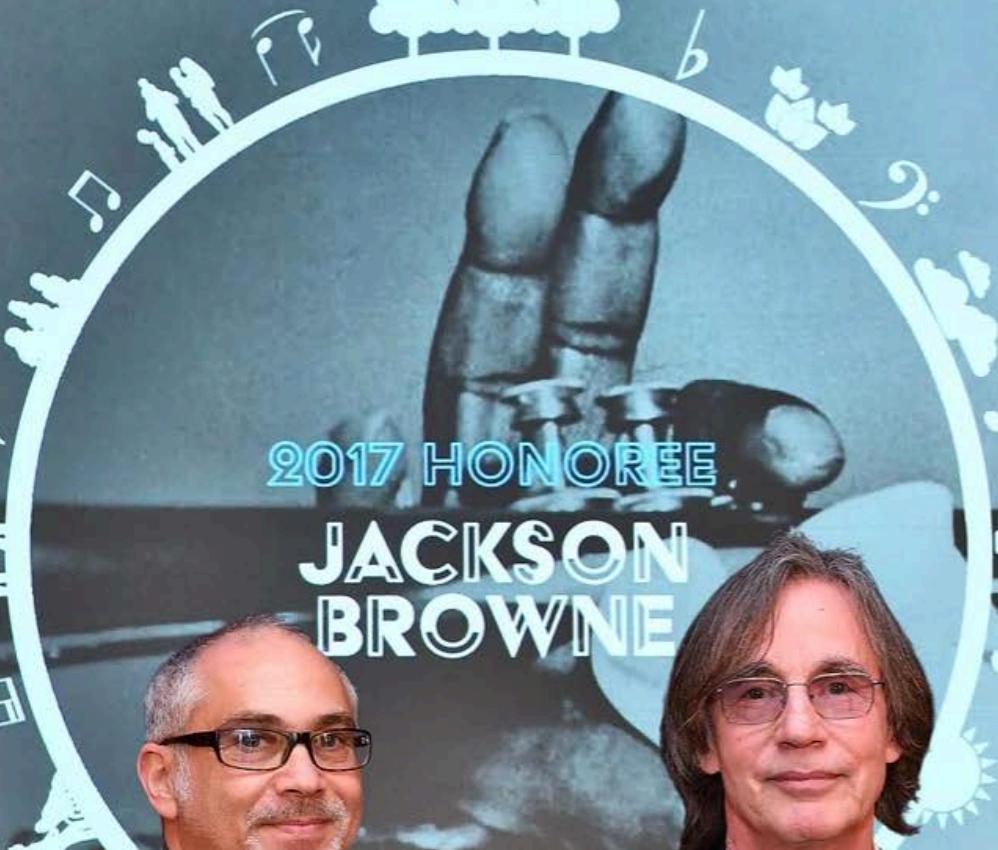




WONDERFUL WORLD
Friends of Music Therapy

GALA
SEPTEMBER 18TH

2017
—NYC—



2017 HONOREE
**JACKSON
BROWNE**











LACMM began in 1994-Grants: Public & Private-Society for the Arts in Healthcare, Grammy Foundation, Louis Armstrong Ed Foundation, Heather-on-Earth Music Foundation, Tyson Foundation, Remo, CVS, TTS



**Mount
Sinai**
Beth Israel

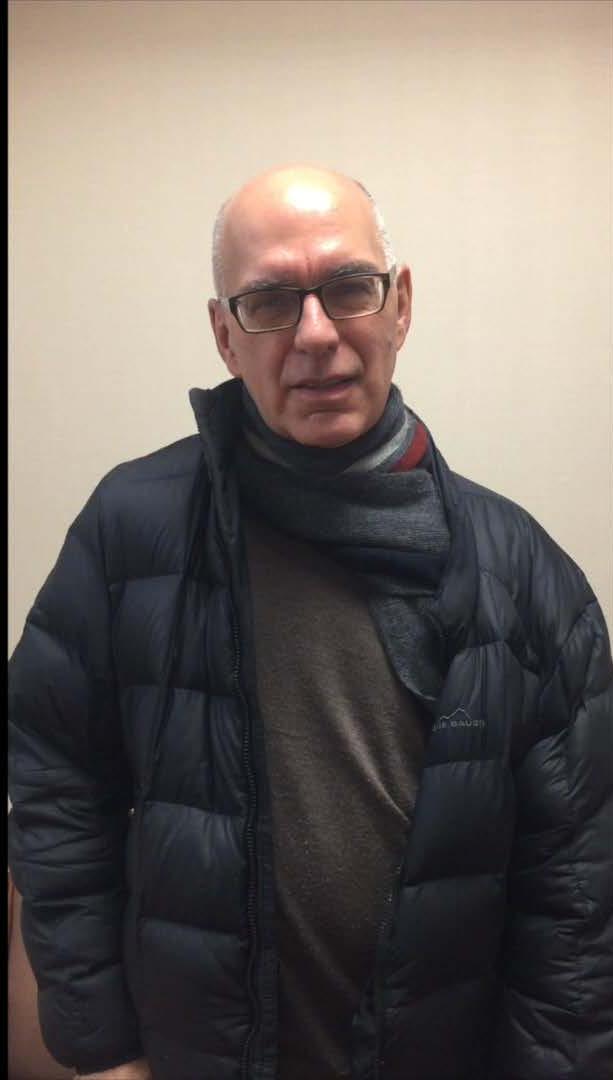
Measure By Measure...



The Louis Armstrong Center for Music & Medicine invites you to enroll in a study on the effects of singing:

A New Singing Group for Stroke Folks & Caregivers

**It's FREE to join! Phillips Ambulatory Care Center
10 Union Square East
MONDAYS 5-6PM**





2J







The Louis Armstrong Music Therapy Department



Am J Orthop. 2017 January;46(1):E13-E22

Music Therapy Increases Comfort and Reduces Pain in Patients Recovering From Spine Surgery

John F. Mondanaro, MA, LCAT, MT-BC, CCLS

Peter Homel, PhD

Baron Lonner, MD

Jennifer Shepp, MAS, BSN, RN, CNM

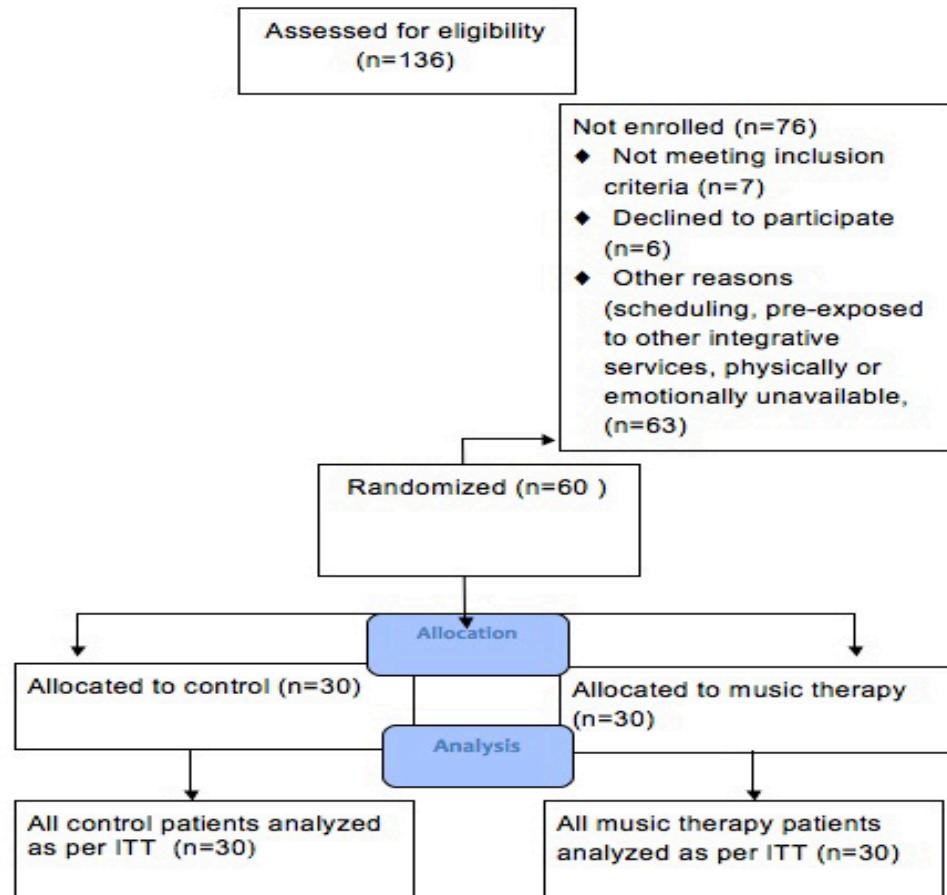
Marcela Lichtensztejn, MA, LCAT, MT-BC, NRMT

Joanne V. Loewy, DA, LCAT, MT-BC

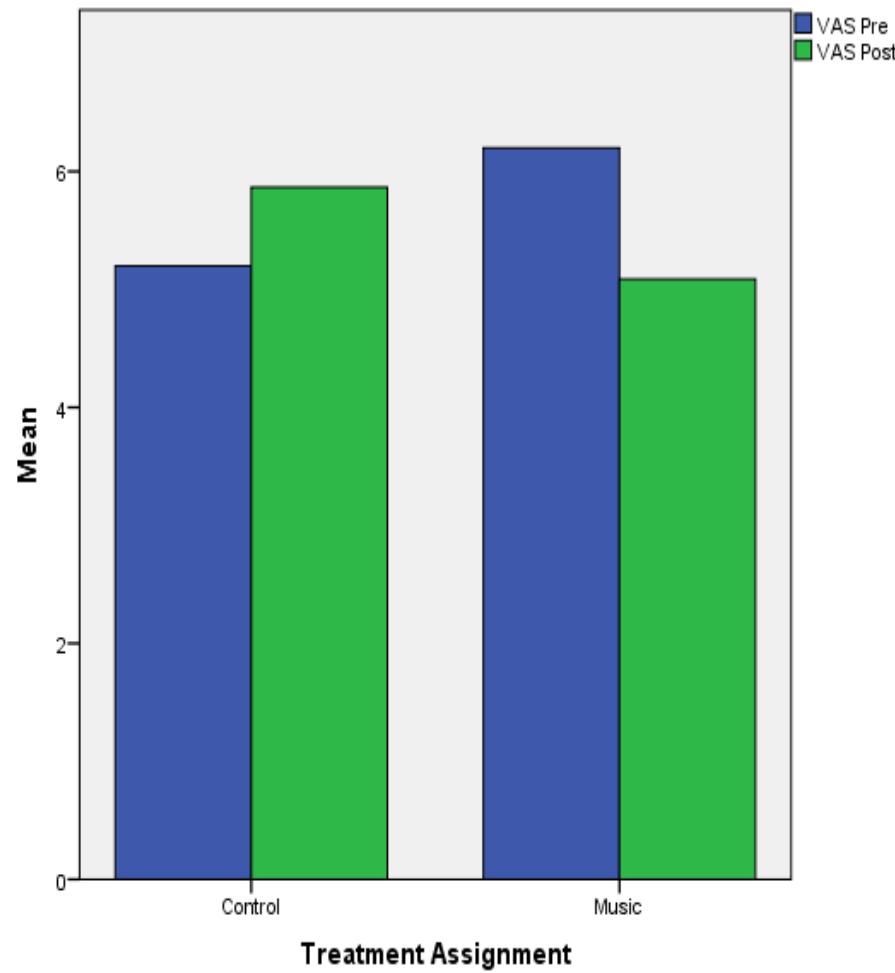
ABSTRACT

The treatment of pain continues to gain in saliency as a component of defining best practice in medical care. Music therapy is an integrative treatment modality that impacts patient outcomes in the treatment of spinal pain. At Mount Sinai Beth Israel, we conducted a mixed-methods study addressing the effects of music therapy interventions on the recovery of patients after spine surgery. The study combined standard medical approaches and integrative music therapy. Sixty patients (35 female, 25 male) ranging in age from 40 to 55 years underwent anterior, posterior, or anterior-posterior spinal fusion and were randomly assigned to either music therapy plus standard care (medical and nursing care with scheduled pharmacologic pain intervention) or standard care only. Measurements for both groups were completed before and after the intervention. Music therapy involved the use of patient-preferred live music that supported tension release/relaxation through incentive-based clinical improvisation, singing, and/or rhythmic drumming or through active visualization supported by live music that encompasses tension resolution. The control and music groups showed significant differences in degree and direction of change in the visual analog scale (VAS) pain ratings from before to after intervention ($P = .01$). VAS pain levels increased slightly in the control group (to 5.87 from 5.20) but decreased by more than 1 point in the music group (to 5.09 from 6.20). The control and music therapy groups did not differ in the rate of change in scores on Hospital Anxiety and Depression Scale (HADS) Anxiety ($P = .62$), HADS Depression ($P = .85$), or Tampa Scale for Kinesiophobia ($P = .93$). Both groups had slight increases in HADS Anxiety, comparable decreases in HADS Depression, and minimal changes in fear-related movement (Tampa scale).

The Louis Armstrong Music Therapy Department



The Louis Armstrong Music Therapy Department



The Louis Armstrong Music Therapy Department



Table 3. Relationship With Music

Significant Relationship

Listens to music at home with husband—patient attends concerts and enjoys music from the 1970s

Family has rich musical history—brother is an accomplished musician, and patient has a particular interest in blues

Patient has positive relationship with music therapy from witnessing positive impact at psychiatric unit (patient's place of employment)

Patient drums for relaxation at home and loves different kinds of music

Patient uses music for both relaxation and energizing effect

Patient loves all kinds of music—any particular genre—music motivates, relaxes, and "helps with migraines"

Patient's father and several male relatives played guitar often during patient's childhood—regularly listens to jazz, blues, and salsa, depending on mood

No Significant Relationship

"Only playing the plastic recorder in grade school"

Patient studied guitar and piano to complete a required college course and is "doing well with guitar" yet finds no significant enjoyment in it

"None"

Patient has no prior musical training—reports being "tone deaf" despite the fact that husband is a music producer

Table 4. Current Beliefs/Perspectives About Surgery

Optimistic

Patient understands surgery is a quality-of-life decision and elects to have surgery

Patient has a "stick-to-it" attitude that will help [him] through recovery

"I feel better already—I needed this surgery"

Indifferent

Spinal injury was the result of an accident: "It was life"

Patient has had "so many ineffective surgeries" that there are no expectations or hopes

Patient believes "it will be a long road before feeling better"

Pessimistic

"Surgery is going to hinder everyday life and activities—for example, going to the gym—and I won't be able to do the things I used to"

Patient feels there is "no choice but to have the surgery now"—does not expect to resume same quality of life

"I am out of my mind to have the surgery—I should've gotten more opinions—this surgery may not be my last"

Patient is anxious and scared about inability to stand up or do anything on his own

Trainings....

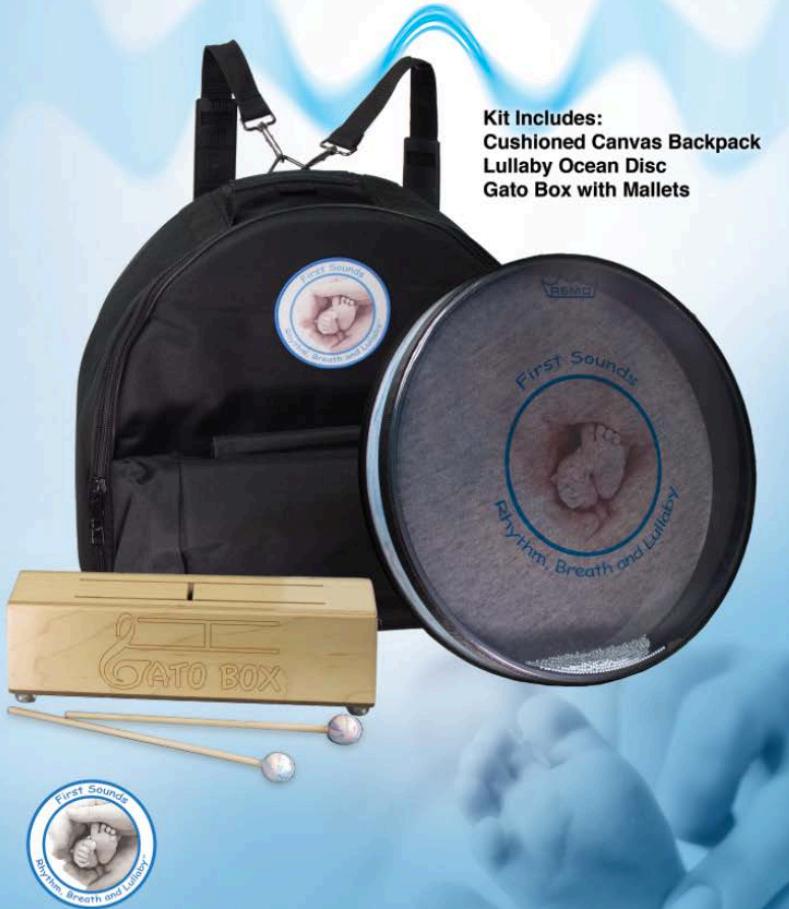




Rhythm, Breath and Lullaby Kit

Rhythm, Breath & Lullaby Kit provides the rhythm instruments suited for entraining to an infant's vital signs and may assist in self-regulation.

Kit Includes:
Cushioned Canvas Backpack
Lullaby Ocean Disc
Gato Box with Mallets



Designed for the Louis Armstrong Center for Music and Medicine's
First Sounds: Rhythm, Breath and Lullaby NICU Program

Infant trauma factors

- A preterm infant may face these acute states of hyper-arousal up to 60 to 100 times as part of routine procedural care.
- In cases of extreme prematurity, such as with infants born at less than 27 weeks gestation, the average number of procedures increases to 300, with one case recording as many as 488 procedures



Hyman, M. (2009). Symptoms of post traumatic stress in parents of NICU infants. In S. N. Graven (Chair), Feelings matter: Psychological and physiological interactions in the NICU. Symposium conducted at the meeting of the 22nd Annual Gravens Conference on the Physical and Developmental Environment of the High Risk Infant, Clearwater, Florida.

Hospitals in Participation with RBL Music Therapy and Research



- Cincinnati Children's Hospital
- Children's Hospital of Philadelphia (CHOP)
- Hahnemann Hospital
- Maria Ferrai Children's Hospital
- Hackensack University Medical Center
- Primary Children's Hospital
- Stonybrook University Hospital
- McGill University Healthcare (Canada)
- Maimonides Hospital
- IUSM Riley Children's Hospital
- Northwell Health
- Mount Sinai West
- Mount Sinai Health System





International Journal of Radiation Oncology*Biology*Physics

Available online 8 May 2017

In Press, Accepted Manuscript — Note to users



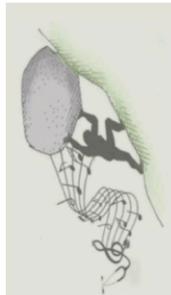
Clinical Investigation

The Impact of Music Therapy (MT) on Anxiety in Cancer Patients Undergoing Simulation for Radiation Therapy (RT)

Andrew Rossetti, MMT, LCAT, MT-BC, Manjeet Chadha, MD, FACR,
FASTRO,

B. Nelson Torres, MPH, Jae K. Lee, PhD, Donald Hylton, AAS, RTT,
Joanne V. Loewy, DA, LCAT, MT-BC, Louis B. Harrison, MD, FASTRO

Purpose: Radiation therapy (RT) is associated with high stress levels. The role of MT in patients receiving RT is not well described. This study evaluates **the impact of MT on newly diagnosed head & neck, and breast cancer** patients' anxiety and distress during simulation.



Trauma Theory & Treatment: Somatosensorial Implications of Resilience

Monday, May 7th, 2018

*The Louis Armstrong Center for Music and Medicine
Mount Sinai Beth Israel, 10 Union Square East, New York, NY 10003*



THE LOUIS ARMSTRONG CENTER FOR MUSIC AND MEDICINE PRESENTS:



Trauma Theory & Treatment: Somatosensorial Implications of Resilience

Monday, May 7th, 2018

COURSE DESCRIPTION

This single day event will provide a unique forum, highlighting the cutting edge intersection of music therapy with other psychotherapeutic modalities in the treatment of emotional trauma. Professionals will come together to share innovative clinical work, to elucidate theory, practice, and research explicating current directions in the treatment of emotional trauma and related pathologies.

LEARNING OBJECTIVES

After attending this conference, attendees will demonstrate the ability to:

- Describe current findings on neurologic, psychological, and physical response to traumatic experiences, and how they regulate emotional and behavioral responses.
- Explain the role of the therapeutic relationship in protecting and restoring safety and regulation.
- Explain current designs of psychotherapy treatment studies and outcomes, and the clinical implications of treatments in the area of trauma and dissociation.
- Strategize methods of implementing music therapy as part of dedicated treatment for the sequelae of emotional trauma.
- Integrate current medical, creative arts therapies, and biopsychosocial research in the development of best practices for Music Therapy and Music & Medicine in trauma treatment.
- Identify converging strategies, overlap, and team-based treatment.
- Identify how issues of safety, shame, trust, cultural differences, core beliefs, and boundaries can be resolved by trauma informed care.

TARGET AUDIENCE

Physicians, Nurses, Psychologists, Social Workers, Music Therapists, Chaplains, Councilors, Creative Arts Therapists, Other Healthcare Professionals PT, OT, Child Life Specialists, Fellows, Residents, and Medical Students.

Conference Location

Mount Sinai Downtown Union Square, 2nd Fl. Conference Center
10 Union Square East, (between 14th & 15th Streets), NYC
Secure parking in building
Subways: 4, 5, 6, N, R, L, W & Q trains to Union Square

Nearby accommodations: Leo House (212) 929-1010
Seafarers & International House (212) 677-4800
Gramercy Park Hotel (212) 475-4320

Registration

Pre-register by mail or telephone, by DATE to ensure participation.
Registration also available on site May 7TH 2018
For more info: 212-420-2704 or email:info@musicandmedicine
Mail completed form below to:
The Louis Armstrong Center for Music and Medicine
Mount Sinai Beth Israel
First Avenue at 16th Street, 6S-21
New York, NY 10003

Registration Form

Trauma Theory & Treatment: Somatosensorial Implications of Resilience

Monday, May 7th, 2018

First Name _____

Last Name _____

Address _____

Email _____

City State Zip _____

Affiliation _____

Advanced Registration

Check appropriate category

- \$150 Full conference, professional
 \$100 Full conference, student

On-Site Registration

Check appropriate category

- \$175 Full conference, professional
 \$125 Full conference, student

Online registration is available at:

<https://cmetracker.net/STLUKESCM/Catalog?sessiontype=Course>

Please make checks payable to:

***The Louis Armstrong Center
for Music and Medicine***



Cancellation Policy: A refund less a \$50 administrative fee will be issued upon written request. No refunds will be made after April 25, 2018.



Music in Healthcare



Armstrong Model: Live music is safest-
Recorded music does not allow for 'entrainment'-
adapting to the HR, RR & the moments of
transition



快乐的儿科人









Mount
Sinai
Beth Israel

About Music & Medicine



Clinical music therapy interventions are based on a growing body of evidence indicating that music therapy may improve:



- Breathing
- Regulate heart rate & blood pressure
- Improve homeostasis nervous system
- Addressing pain & building resiliency
- Facilitate social engagement
- Provide ego support
- Enhance quality of life



Armstrong Theoretical Orientation

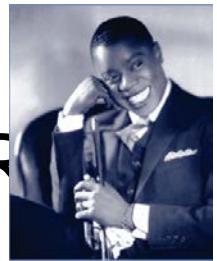


- **Music psychotherapy Orientation** – involves music within the context of the relationship between patient and therapist.
- **Wellness Model**– looking beyond reduction of physical symptoms. Quality of Life.

- **Holistic view** of the person – physical, emotional, cognitive, developmental, social, spiritual
- Consideration of **traumatization** related to illness and hospitalization
- Predominantly **live music** vs. recorded music
- **Multicultural perspectives**



Research Projects: w/MDs & F

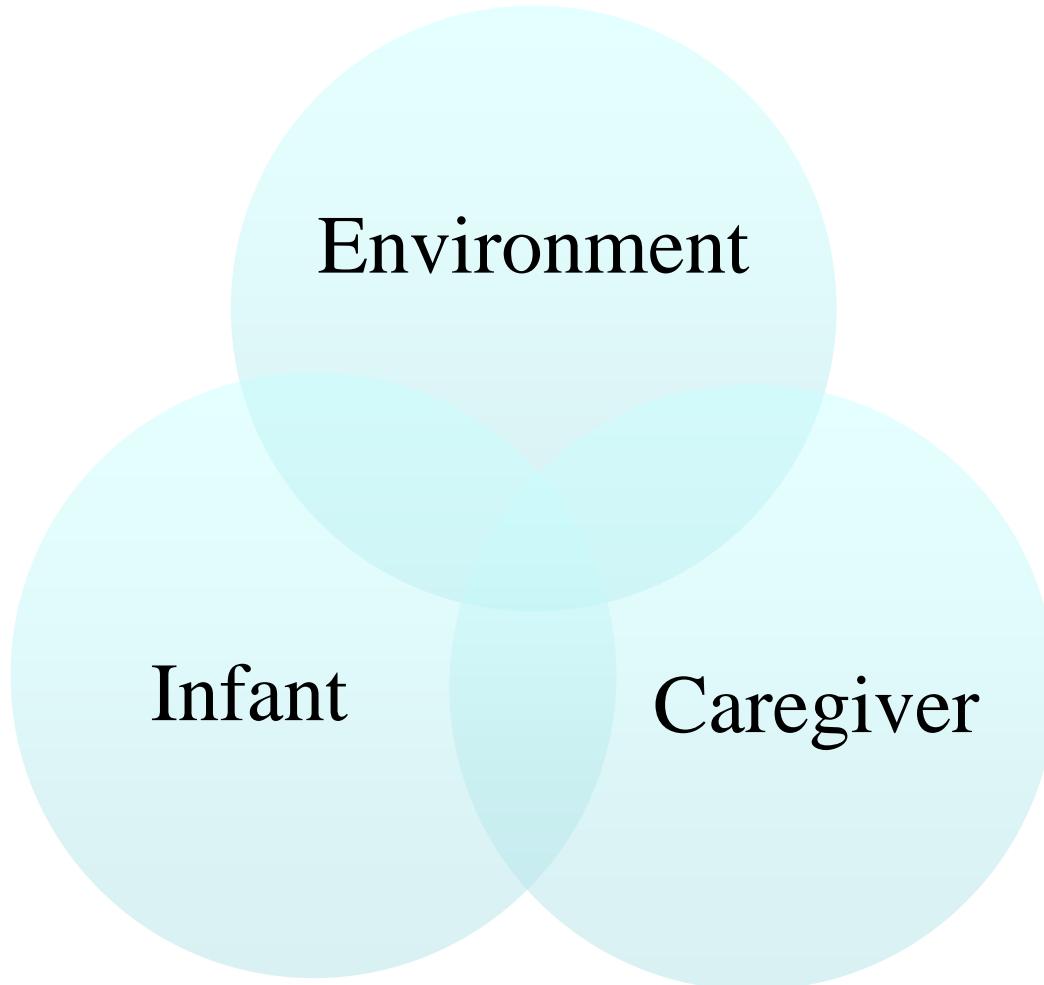


AIP (Asthma Initiative Program): n=200+/Clinic/3 schools-Bronx, Brooklyn Lower East Side (Complete under review)

- Music for AIR (Advances in Respiration)
n=200 CCPH & Nursing Homes (complete-published)
- Music Therapy in Simulation-Pre-Radiation (Trauma) n=75 (complete-published)
- Radiation Oncology: a. Simulation Anxiety n=76 b. MT & Perception of Waiting Time (on-going)
- Helen Sawaya Resiliency Study-Infusion-Chemotherapy N=76 (on-going)
- Spine-Ortho-Pain: Music in Recovery N=70 (published)
- SICU-Impact of Noise, and Music with Patients, Caregivers and Staff (on-going) n= 120
- Stroke Choir (Survivors & Carers)-Impact of Singing on Language/Quality of Life, Mood (WAB, NIHSS SAQOL), Saliva sampling-n=80

NICU Music Therapy

3 Prong Model



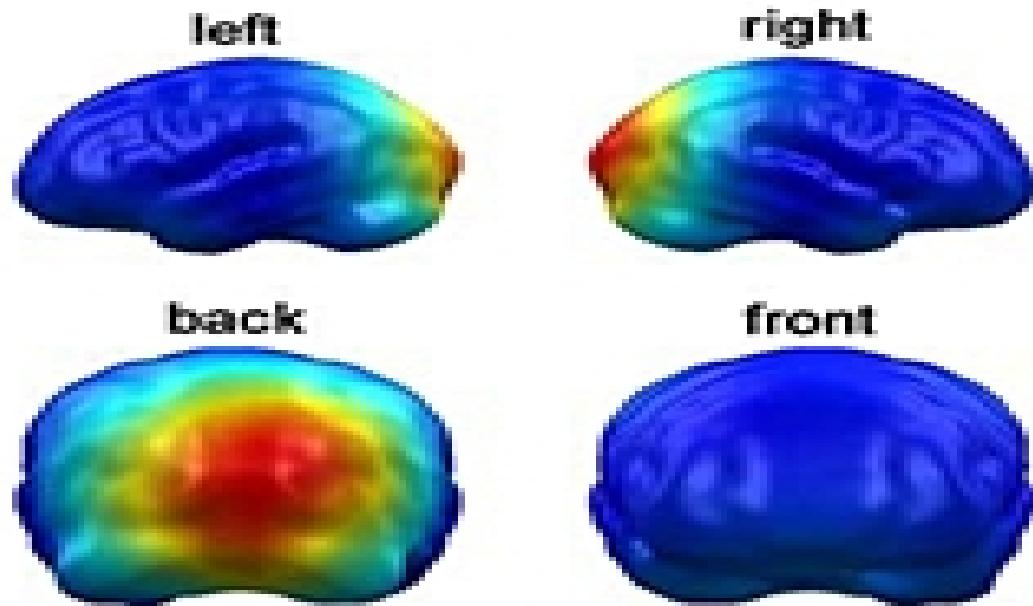


Trauma is a disruption of the
rhythm of the self.

(Levine, van der Kolk)

Pain Experience: Porges

PTSD Patients



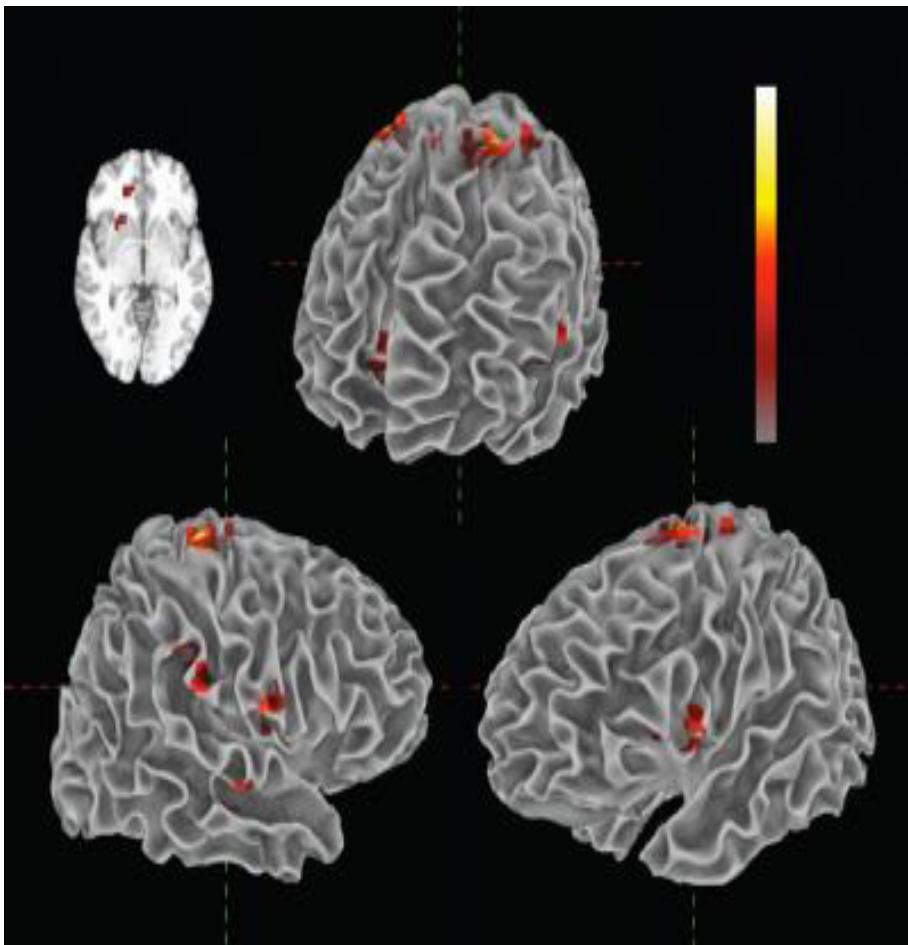
Infant trauma factors

- A preterm infant may face these acute states of hyper-arousal up to 60 to 100 times as part of routine procedural care.
- In cases of extreme prematurity, such as with infants born at less than 27 weeks gestation, the average number of procedures increases to 300, with one case recording as many as 488 procedures



Hyman, M. (2009). Symptoms of post traumatic stress in parents of NICU infants. In S. N. Graven (Chair), Feelings matter: Psychological and physiological interactions in the NICU. Symposium conducted at the meeting of the 22nd Annual Gravens Conference on the Physical and Developmental Environment of the High Risk Infant, Clearwater, Florida.

Neural Activity is Time-Locked to Tempo Fluctuations in Music Making



- Animation of the real-time changes in neural activity were time-locked to the tempo fluctuations in a musical performance. This animation includes a subset of the brain regions that exhibited time-locked activity. Shown are cortical and subcortical motor areas thought to be involved in **pulse perception**, and a network of areas consistent with the human **'mirror neuron' system**.
- Chapin H, Jantzen K, Scott Kelso JA, Steinberg F, & Large E. (2010). [Dynamic Emotional and Neural Responses to Music Depend on Performance Expression and Listener Experience](#). PLoS ONE 5(12): e13812. doi:10.1371/journal.pone.0013812

The Acoustic Environment of the Womb & Fetal Hearing-Prenatal University

(Emde, 1991; Gerhardt & Abrams, 2004)

- Womb Sound Floor
 - Maternal HR, RR, intestinal activity, body movements
 - As frequency, intensity, tone, duration
 - Characterized by constancy and rhythmicity
- ❖ Sound received as vibration through skull
 - ❖ Sequential development begins with entraining to womb and HB sounds
 - ❖ Hearing begins at 16 weeks

HIGH-ALERT MEDICATIONS
(NEONATE)

Commonly Confused Or
Dose In EKG
Intubation
Aspirin
Nitro
Oxygen



Song of Kin

It is essential, especially at the beginning of the therapy, to discover the most relevant song or melody that will initiate the relationship. The music of a kin (Loewy, 2000, 2007, 2013, 2015) can be an anchor, an orienting theme, that may accompany the patient through transformation.





Mount
Sinai
Beth Israel



The **song of a kin** is a well-known tune from the patient's tradition; from popular repertoire, or from their cultural/religious heritage. This song has special meaning for the patient. When a family member is unable to connect with the patient, the music can bridge the distance between them. The sound waves travel to a place where the words may not be permitted to reach.

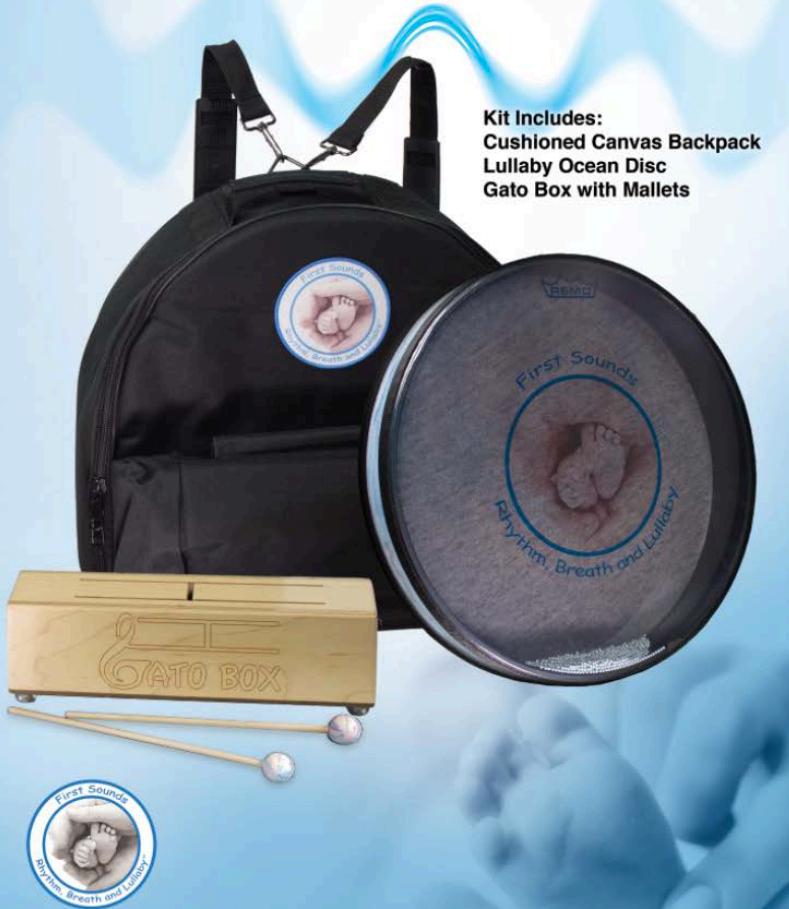




Rhythm, Breath and Lullaby Kit

Rhythm, Breath & Lullaby Kit provides the rhythm instruments suited for entraining to an infant's vital signs and may assist in self-regulation.

Kit Includes:
Cushioned Canvas Backpack
Lullaby Ocean Disc
Gato Box with Mallets



Designed for the Louis Armstrong Center for Music and Medicine's
First Sounds: Rhythm, Breath and Lullaby NICU Program

Simon C. Kao
Susan D. Adamson
Leann H. Tatman
Kevin S. Berbaum

A survey of post-discharge side effects of conscious sedation using chloral hydrate in pediatric CT and MR imaging

Received: 18 June 1998
Accepted: 5 November 1998

Abstract *Background.* Limited information is available on post-discharge side effects of chloral hydrate sedation in pediatric imaging.

Objective. To prospectively study the post-discharge side effects of chloral hydrate sedation in pediatric CT and MR imaging.

Materials and methods. A total of 119 children undergoing CT and MRI were sedated using chloral hydrate with 89% success (mean initial dose, 72 mg/kg body weight) and 98% success after augmentation (mean total, 78 mg/kg body weight). The frequency of each post-discharge side effect was correlated with other side effects and 12 patient/technical parameters.

Results. The survey was completed

in 80 children. Sleepiness lasted for > 4 h in 28%. Unsteadiness occurred in 68% and hyperactivity in 29%. Appetite became poor in 14% and vomiting occurred in 15%. Normal activity was resumed after > 4 h in 54%. Sleep deprivation did not result in increased success or earlier onset of sedation and might be associated with hyperactivity. A higher dose did not result in an increased success rate or earlier onset of sedation within the dose range used in this study.

Conclusion. Data on the post-discharge side effects of chloral hydrate sedation will be useful to radiologists, technologists, and nurses explaining to parents about sedation using this agent.

S. C. Kao (✉) · S. D. Adamson ·
L. H. Tatman · K. S. Berbaum
Department of Radiology, 3894 JPP,
The University of Iowa College of
Medicine, 200 Hawkins Drive,
Iowa City, IA 52242, USA

Sleep/Sedation in Children Undergoing EEG

A comparison of Chloral Hydrate & Music Therapy

N=60 matched for age, sex

Intervention randomly assigned 30 minute period

Loewy, J. Hallan, C., Friedman, E., Martinez, C.

*Journal of PeriAnesthesia Nursing, Volume 20, Issue 5,
323-332, October 2005.*

Loewy, J. Hallan, C., Friedman, E., Martinez, C.

*American Journal of Electroneurodiagnostic Technology
Vol. 46, No. 4, 343-355, December 2006.*

Dependent Variable	Music Therapy (N = 33)	Chloral Hydrate (N = 31)	
'Length of sleep/ sedation'	Mean: 66 min Std.dev: 25.6908	Mean: 226 min Std.dev: 94.8713	Mean diff: 160 min Sig. (2-tailed) = .000
' Time to achieve sleep/ sedation'	Mean: 23 min Std.dev: 16.3613	Mean: 32 min Std.dev: 24.2579	Mean diff: 9 min Sig. (2-tailed) = .236
'Level of sleep/ sedation'	Median: 3 Intraquartile range: 0	Median: 4 Intraquartile range: 0	Median diff: 1 Assymp. sig. (2-sided) < .001

Table 2: Group means/medians for three sleep/sedation outcomes. The differences in mean/median and the *P* values are shown in the last column.

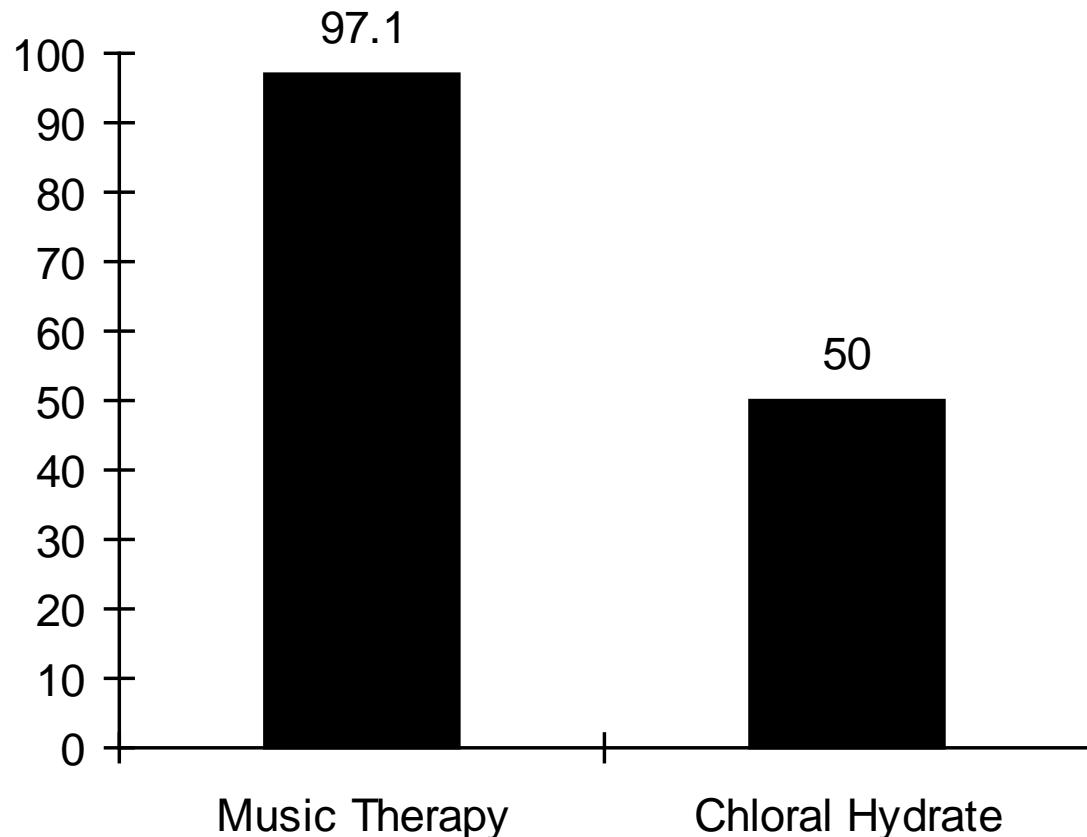


Fig.1: The percentage of children who were able to complete the EEG with no complementary treatment. The percentage of children successfully sedated with chloral hydrate (50%) vs. the children successfully asleep using music therapy **only (97.1%)**

The Music Instinct



The Effects of Music Therapy on Vital Signs, Feeding, and Sleep in Premature Infants

AUTHORS: Joanne Loewy, DA, LCAT, MT-BC,^a Kristen Stewart, MA, LCAT, MT-BC, SEP,^a Ann-Marie Dassler, RN, MSN, FNP, IBCLC,^b Aimee Telsey, MD,^b and Peter Homel, PhD^a

^a*The Louis Armstrong Center for Music & Medicine*; ^b*NICU*, and ^c*Department of Biostatistics, Beth Israel Medical Center, New York, New York*

KEY WORDS

music therapy, music medicine, acoustic stimulation, NICU music interventions

ABBREVIATIONS

CI—95% confidence interval

ES—effect size

HR—heart rate

IRB—institutional review board

RR—respiratory rate

SGA—small for gestational age

Dr Loewy conceptualized and designed the study, drafted the initial manuscript, and approved the final manuscript as submitted; Ms Stewart designed the data collection materials and trained the multisite researchers, and analyzed the data and reviewed the final manuscript; Ms Dassler assisted in the study design, interpreted the results of the outcomes, and edited the final manuscript; Dr Telsey assisted in the study

WHAT'S KNOWN ON THIS SUBJECT: Recorded music, parent voices, and sung lullabies have been shown to increase oxygen saturation, nonnutritive sucking, and weight gain in premature infants.

WHAT THIS STUDY ADDS: Parent-preferred melodies and entrained live rhythm and breath sounds can enhance quiet alert and sleep states, suck response, and oxygen saturation in premature infants and significantly reduce fear and anxiety perception in parents.

abstract

OBJECTIVES: Recorded music risks overstimulation in NICUs. The live elements of music such as rhythm, breath, and parent-preferred lullabies may affect physiologic function (eg, heart and respiratory rates, O₂ saturation levels, and activity levels) and developmental function (eg, sleep, feeding behavior, and weight gain) in premature infants.

The New York Times

NEW YORK, MONDAY, APRIL 15, 2013

Live Music's Charms, Soothing Premature Hearts

By PAM BELLUCK

Even the Beatles would have had trouble recognizing their peppy song in the lullaby that Andrea Zalkin sang to the tiny, fragile baby clutched to her chest in the neonatal unit. But there was something unintentionally poignant about the moment. "Eight Days a Week" is more time than can fit on the calendar. Ms. Zalkin's baby, Hudson, born 13 weeks early, has had too little time.

As she sang, monitors showed Hudson's heartbeat slowing and his oxygen saturation increasing. Effects like that were among the findings of a study that studied the use of music as medicine.

Beth Israel Medical Center in New York City led the research, conducted in 11 hospitals, which found that live music can be beneficial to premature babies. In the study, music therapists helped parents transform their favorite tunes into lullabies.

The researchers concluded that live music, played or sung, helps premature babies' heartbeats, calm their breathing, improve sucking behavior, important for feeding, aid sleep and promote states of quiet alertness. Doctors and researchers say that by reducing stress and stabilizing vital signs, music can allow infants to devote more energy to normal development.

And while the effects may be subtle, small improvements can be significant. Premature births have increased since 1990, to nearly 300,000 a year, one of every nine children born in the United States.

This study, published in the journal *Journal of the American Medical Association*, adds to growing research on music and preterm babies. Some hospitals find music as effective as, and safer than, sedating infants before procedures like heart sonograms and brain monitoring. Some neonatologists say babies receiving music therapy leave hospitals sooner, which can aid development and family bonding and save money.

Dr. Thomas J. Truman, the director of neonatal and pediatric intensive care at Tallahassee Memorial Hospital in Florida, which was not involved in the study, said infants who had music played to them went home earlier "at least by a couple of days, compared to babies that weren't getting music therapy."

The music, he said, "helps decrease their stress response" and "re-activate more of their oxygen and calories to developing and growing."

One reason may be that music is organized, purposeful sound amid the unpredictable, overstimulating noise of neonatal units. "Loud machinery, medical rounds coming through with 12 people, alarms on ventilators and pumps, the hiss of oxygen," said Helen

Helping infants sleep and eat, and calming their heart and breathing rates.

Shoemark, a music researcher at Murdoch Childrens Research Institute in Melbourne, Australia. "Sound can be damaging. But meaning full noise is important for a baby's brain development."

Scientists are far from done determining music's impact, and there are certainly those who are skeptical about its medical value.

Dr. Manoj Kumar, a neonatologist at Stollery Children's Hospital in Edmonton, Alberta, said that while music might have a benefit in heart rate and respiratory rate, "it is unclear whether that prompts



Angela Ferraiuolo-Thompson, left, used a Beatles song to calm Hudson, born 13 weeks preterm, at Beth Israel Medical Center

clinical improvements, like removing oxygen or feeding tubes sooner, questions that the Pediatrics study did not tackle.

The two-year study, larger and more systematic than many efforts to scientifically evaluate music's impact, selected musical elements — rhythm, melody, timbre — to see effects on heartbeat, breathing, sucking, alertness and sleep.

Over two weeks, 272 premature babies underwent several sessions of two instruments, singing and no music at all. The instruments and lullaby singing style were intended to approximate womb sounds. Dr. Joanne Armstrong, director of music and director of Beth Israel's Louis Armstrong Center for Music and Medicine,

Two-tone heartbeat rhythms were played on a "gato box," a rectangular wooden drum. Whooshing sounds came from an "ocean disc," a cylinder containing shifting metal beads. For melody, parents were asked to sing a favorite song. If it wasn't a lullaby (someone chose "I Heard It Through the Grapevine"; another, "Pick Up the Pieces," by Average White Band), therapists slowed it, changed meters to lulling waltzes and added lyrics.

"Lots of times you see parents bobbing the baby up and down on their lap, and there's no purpose to it," Dr. Loewy said. "You don't feel the music intention as much as if you have a song that a parent has chosen."

If parents did not specify, researchers used "Twinkle, Twinkle, Little Star." Tempos were coordinated with babies' vital signs, indicated not only by monitors but also by eye movements and a chest's rise and fall.

Researchers found that the gato box, the ocean disc and singing all slowed a baby's heart rate, though singing seemed to be most effective. Singing also increased the time babies stayed quietly alert. Sucking and breathing were synchronized with the ocean disc. Babies hearing songs their parents chose had better feeding rates and gained more calories than those who heard "Twinkle, Twinkle, Little Star." But the "Twinkle" babies had slightly more oxygen saturation in their blood. The music also lowered parental stress, the study found.

Dr. Loewy, who trains therapists worldwide, said it did not matter whether parents or music therapists sang, or whether babies were in

incubators or held. So they would not have to buy the instruments, parents were taught to mimic them.

Dr. Lance A. Parton, associate director of the regional neonatal intensive care unit at Greenwich Hospital's Children's Hospital, which participated in the research, said it would be useful to see if music could help the sickest and most premature babies, who were not in the study.

"There's definitely a big buzz about music therapy," Dr. Parton said. "said to be only academic ivory tower institutions. But with all the highest things we can do for babies, there are many low-tech things — and music is right up there of that."

While the Pediatrics study involved live music, some programs use recordings. Jayne M. Standley, a professor of medical music therapy at Florida State University, developed the Pacifier Activated Lullaby, a pacifier that plays recordings of women singing when infants suck correctly, speeding the babies' ability to feed independently.

"Live music is optimal because it's in the moment and can adapt to changing conditions," Dr. Standley said. "If the baby appears to be falling asleep, it can sing quieter. Recorded music can't do that. But there are so many premature babies and so few trained live producers of music therapy that it's important to know what recorded music can do."

At Beth Israel, Ms. Zalkin, who said she had discovered that she was pregnant only a week before giving birth in March, said it can feel overwhelming to suddenly have a baby, let alone one who weighed 2 lb. 10 oz. when born. She joined Beth Israel's music therapy program after the study ended.

"With the breathing and the gato boxes and the people running around, that's something that I can't change," Ms. Zalkin said. She chose "Eight Days a Week," she said, because "I grew up on the Beatles." The therapist, Angela Ferraiuolo-Thompson, changed it to a slow waltz, eventually eliminating the actual lyrics but adding "Baby Hudson said 'ah.'"

Recently, Ms. Ferraiuolo-Thompson, strumming a guitar directed Ms. Zalkin to sing lower to calm Hudson's hiccups. "It changes the way he's breathing and I'm breathing, it changes his behavior," Ms. Zalkin said. "Music therapy, it's something you can do."



NICU Clinical Trials:

Creating Womblike Sound Environment & Impact of Music on Vitals and Bonding for Neonates/ Parents

- Incorporating physiology: body sounds: live elements of music-

Gato box (heart beat)

Ocean disc (womb sounds)

Familiar voices and or melodies (parent/caregiver **songs of kin**,
chanting, universal lullaby)

Orchestrating the phase of music-the music shifts &
entraining with the infant's vitals

- Creating the characteristics of the womb to assist with feeds, sleep, quiet alert states, transitions & caregiver stress/bonding
- **A two year study: Multi-site, 11 hospitals in the Northeast USA**

WHAT' S KNOWN ON THIS SUBJECT:

Recorded music, parent voices, and sung lullabies have been shown to increase oxygen saturation, nonnutritive sucking, and weight gain in premature infants.

WHAT THIS STUDY ADDS: Parent-preferred melodies and **trained** **LIVE** **rhythm** and **breath** sounds can enhance quiet alert and sleep states, suck response, and oxygen saturation in premature infants and significantly reduce fear and **anxiety** perception in parents.

OBJECTIVES:

Recorded music risks overstimulation in NICUs. The live elements of music such as **rhythm**, **breath**, and **parent-preferred lullabies** may affect physiologic function (eg heart and respiratory rates, O₂ saturation levels, and activity levels) and developmental function (eg, sleep, feeding behavior, and weight gain) in premature infants.

METHODS:

A randomized clinical multisite trial of **272 premature infants** aged ≥ 32 weeks with respiratory distress syndrome, clinical sepsis, and/or SGA (small for gestational age) served as their own controls in **11 NICUs**. Infants received 3 interventions per week within a 2-week period, when data of physiologic and developmental domains were collected before, during, and after the interventions or no interventions and daily during a 2-week period.

RESULTS: Three live music interventions showed changes in heart rate interactive with time. Lower heart rates occurred during the lullaby ($P < .001$) and rhythm intervention ($P = .04$). **Sucking behavior** showed differences with rhythm sound interventions ($P = .03$). Entrained breath sounds **rendered lower heart rates** after the intervention ($P = .04$) and differences in **sleep patterns** ($P < .001$). Caloric intake ($P = .01$) and sucking behavior ($P = .02$) were higher with parent-preferred lullabies. Music **decreased parental stress perception** ($P < .001$).

Appendix I: NICU Multi-Site Music Therapy Project

Subject #: _____ Age: _____

Music Therapy Intervention/Control Log

Start Date: _____

Intervention (Check 1, 2, or 3 below)				HR			Vitals*			O ² Sat.			Act. Level		
	1	2	3	B/NI	D	A	B/NI	D	A	B/NI	D	A	B/NI	D	A
I I: - I W: Date: PM H:				-10/	5	+10	-10/0	5	+10	-10/0	5	+10	-10/0	5	+10
					10			10			10			10	
					15			15			15			15	
-NI I: W: PM H:				-10/0	5	+10	-10/0	5	+10	-10/0	5	+10	-10/0	5	+10
					10			10			10			10	
					15			15			15			15	
-I I: W: PM H:				-10/0	5	+10	-10/0	5	+10	-10/0	5	+10	-10/0	5	+10
					10			10			10			10	
					15			15			15			15	
-NI I: W: PM H:				-10/0	5	+10	-10/0	5	+10	-10/0	5	+10	-10/0	5	+10
					10			10			10			10	
					15			15			15			15	
-I I: W: PM H:				-10/0	5	+10	-10/0	5	+10	-10/0	5	+10	-10/0	5	+10
					10			10			10			10	
					15			15			15			15	
-NI I: W: PM H:				-10/0	5	+10	-10/0	5	+10	-10/0	5	+10	-10/0	5	+10
					10			10			10			10	
					15			15			15			15	

Intervention (Check 1, 2, or 3 below)				HR			Vitals*			O ² Sat.			Act. Level		
	1	2	3	B/NI	D	A	B/NI	D	A	B/NI	D	A	B/NI	D	A
2 I: - I W: Date: PM H:				-10/0	5	+10	-10/0	5	+10	-10/0	5	+10	-10/0	5	+10
					10			10			10			10	
					15			15			15			15	
-NI I: W: PM H:				-10/0	5	+10	-10/0	5	+10	-10/0	5	+10	-10/0	5	+10
					10			10			10			10	
					15			15			15			15	
-I I: W: PM H:				-10/0	5	+10	-10/0	5	+10	-10/0	5	+10	-10/0	5	+10
					10			10			10			10	
					15			15			15			15	
-NI I: W: PM H:				-10/0	5	+10	-10/0	5	+10	-10/0	5	+10	-10/0	5	+10
					10			10			10			10	
					15			15			15			15	
-I I: W: PM H:				-10/0	5	+10	-10/0	5	+10	-10/0	5	+10	-10/0	5	+10
					10			10			10			10	
					15			15			15			15	
-NI I: W: PM H:				-10/0	5	+10	-10/0	5	+10	-10/0	5	+10	-10/0	5	+10
					10			10			10			10	
					15			15			15			15	

Characteristic	
Female Gender	152 (56 %) ^a
Gestational Age (weeks)	29.57 ± 2.89 ^b
Age at Start of Study (days)	22 (1, 140) ^c
Apgar 1 ^d	6.81 ± 2.08
Apgar 5 ^e	8.11 ± 1.21
Weight at Birth (grams)	1321.22 ± 495.32
Respiratory Distress/ Respiratory Distress Syndrome	153 (88 %)
Clinical Sepsis	87 (32 %)
Small for Gestational Age	53 (19 %)
Values at Baseline	Weight (grams) 1596 ± 374.99
	Heart Rate 156.30 ± 8.45
	Respiratory Rate 50.58 ± 7.65
	O2 Saturation 96.83 ± 2.65
	Total Calories 128.91 ± 50.56
	Sucking Behavior 9.88 ± 2.77

^a Frequency (%)

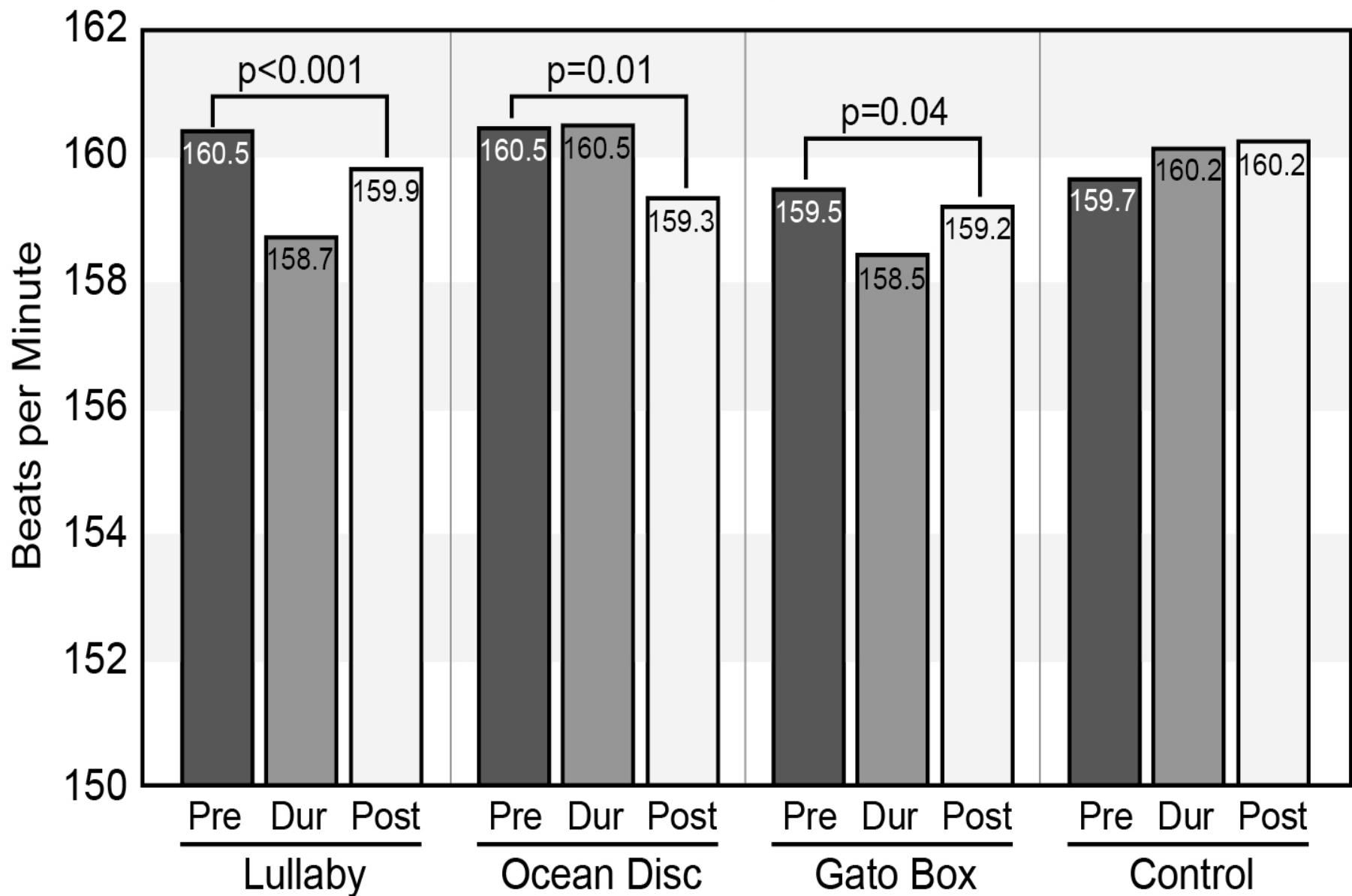
^b Mean \pm standard deviation

^c Median (minimum, maximum)

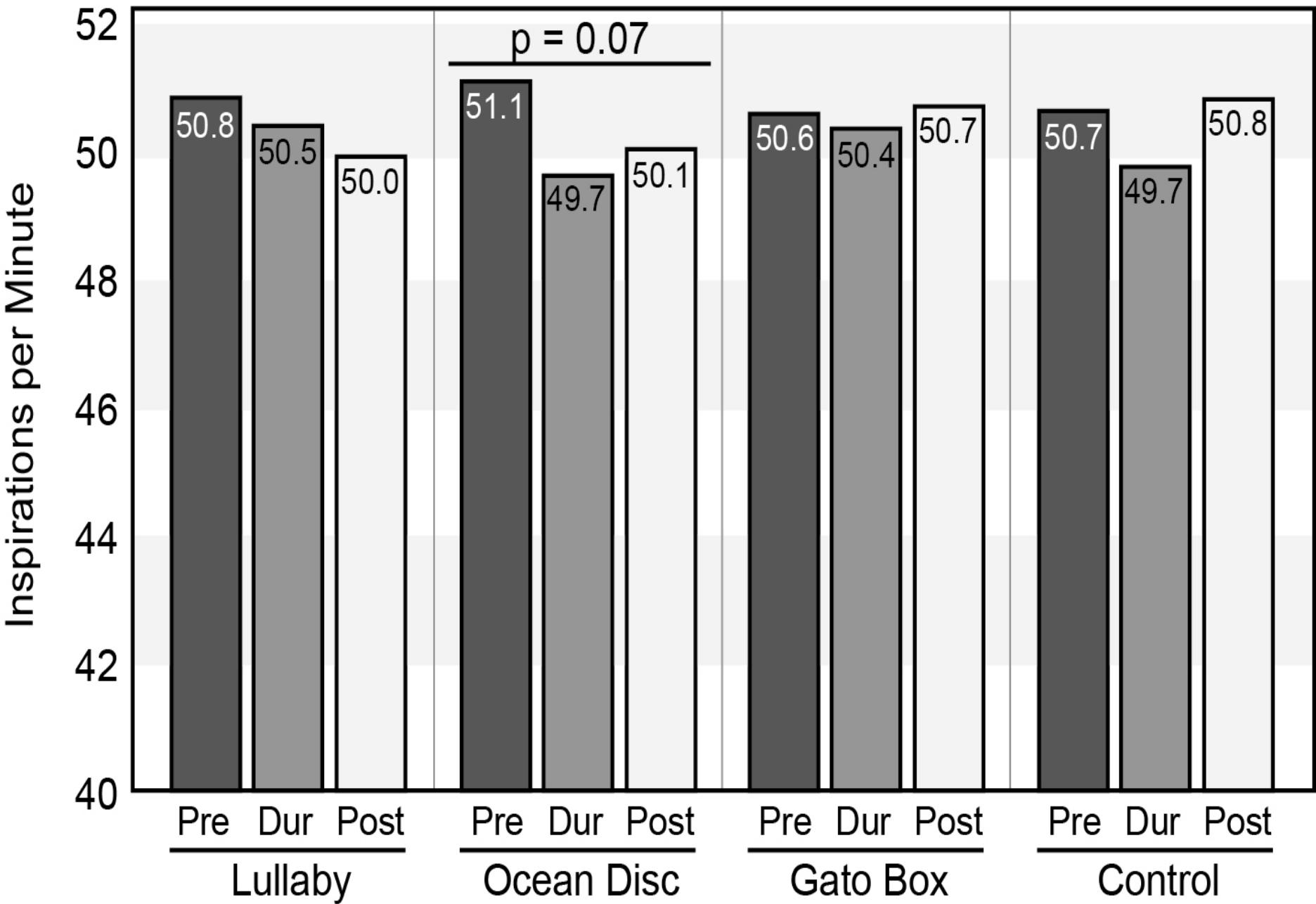
^d Apgar score at birth

^e Apgar score at 5 minutes

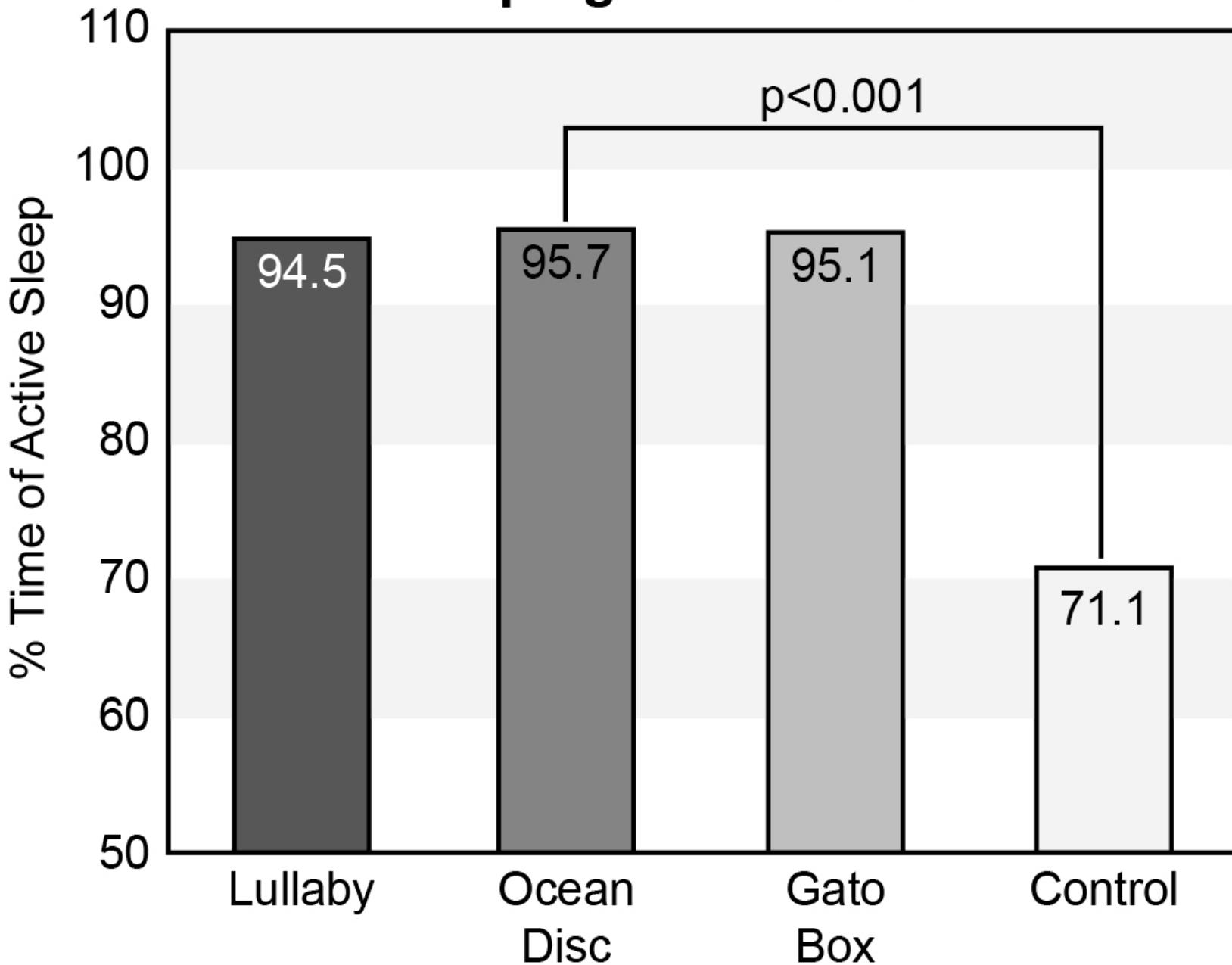
Heart Rate



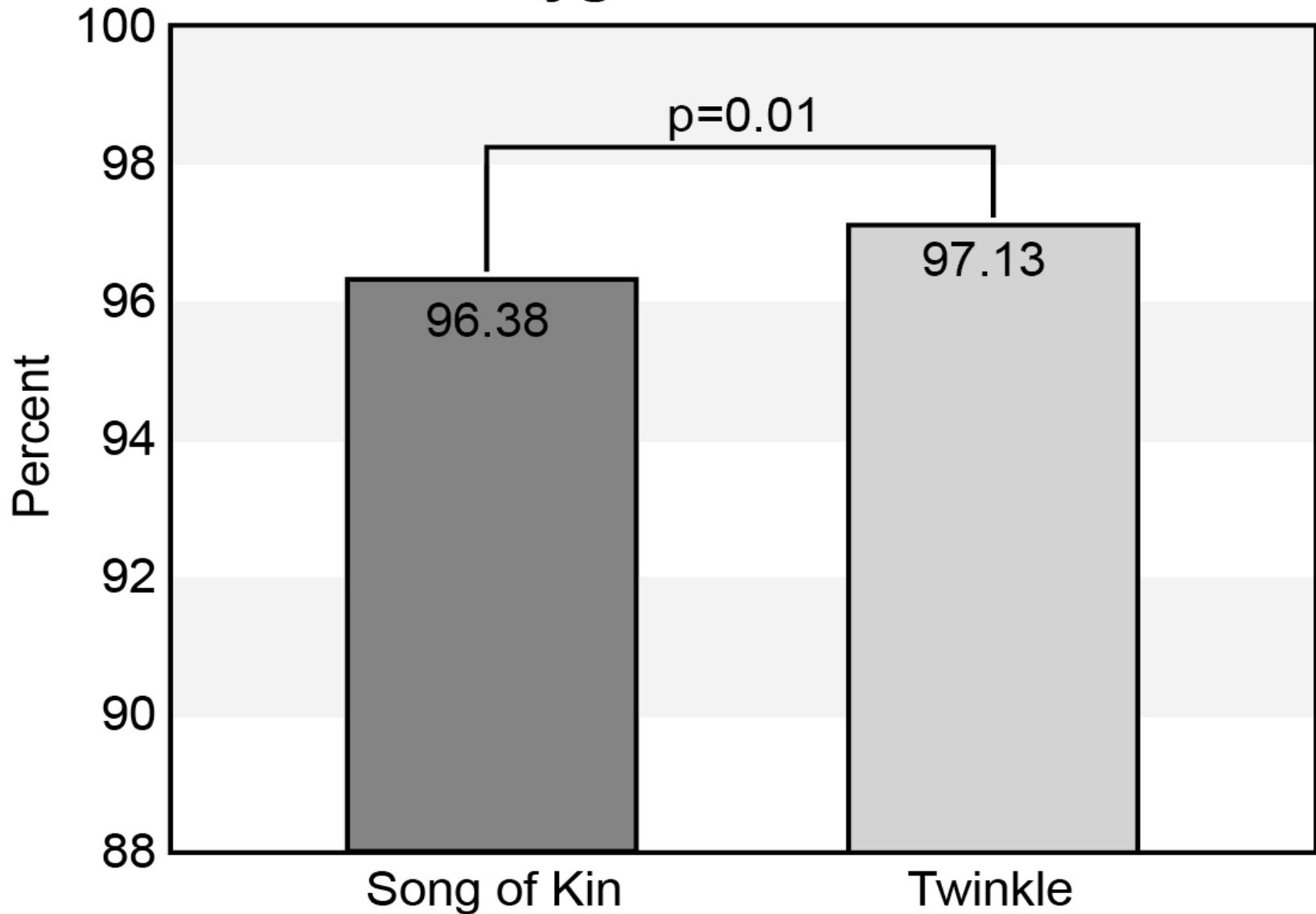
Respiratory Rate



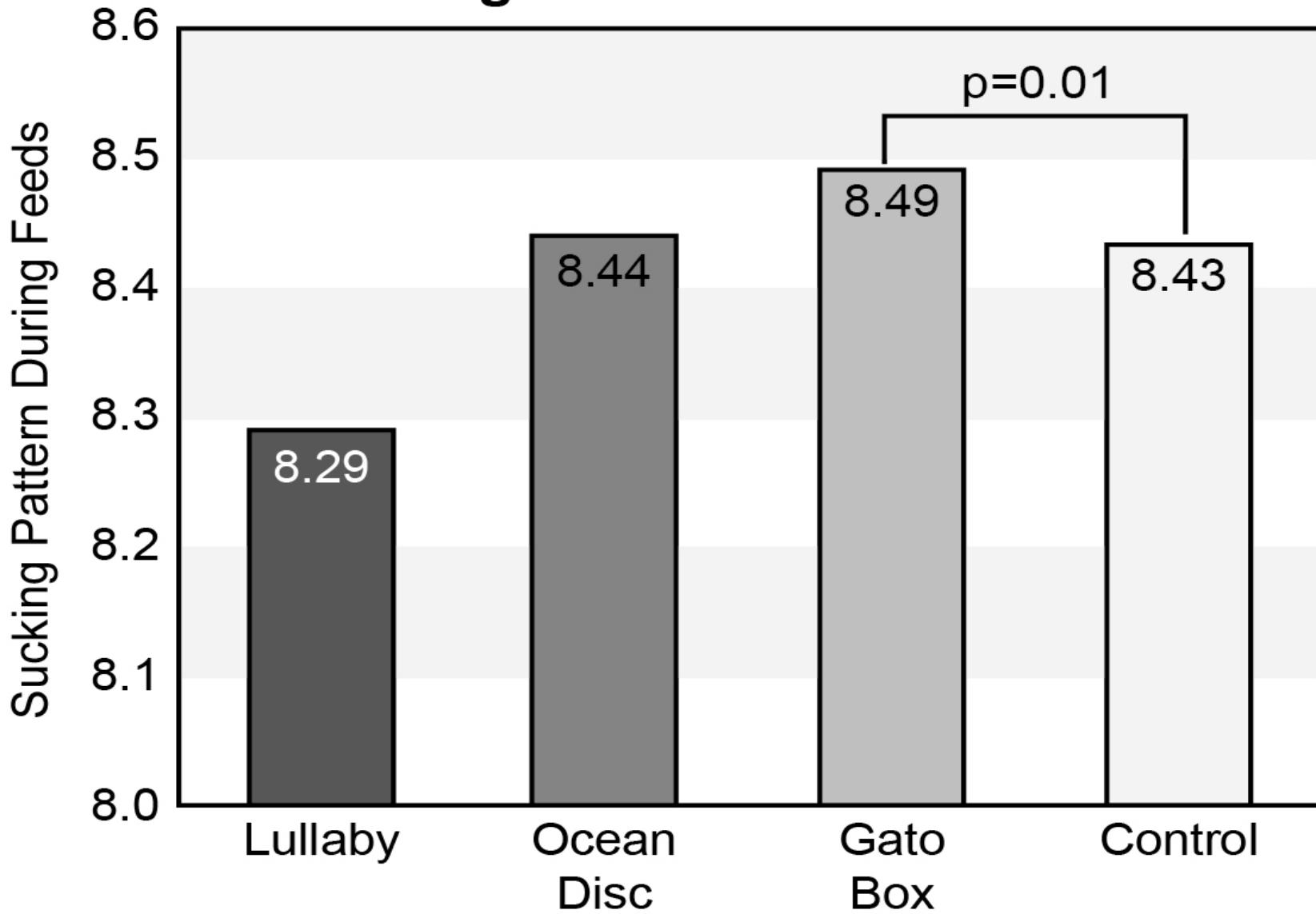
Sleeping Over 2 Weeks



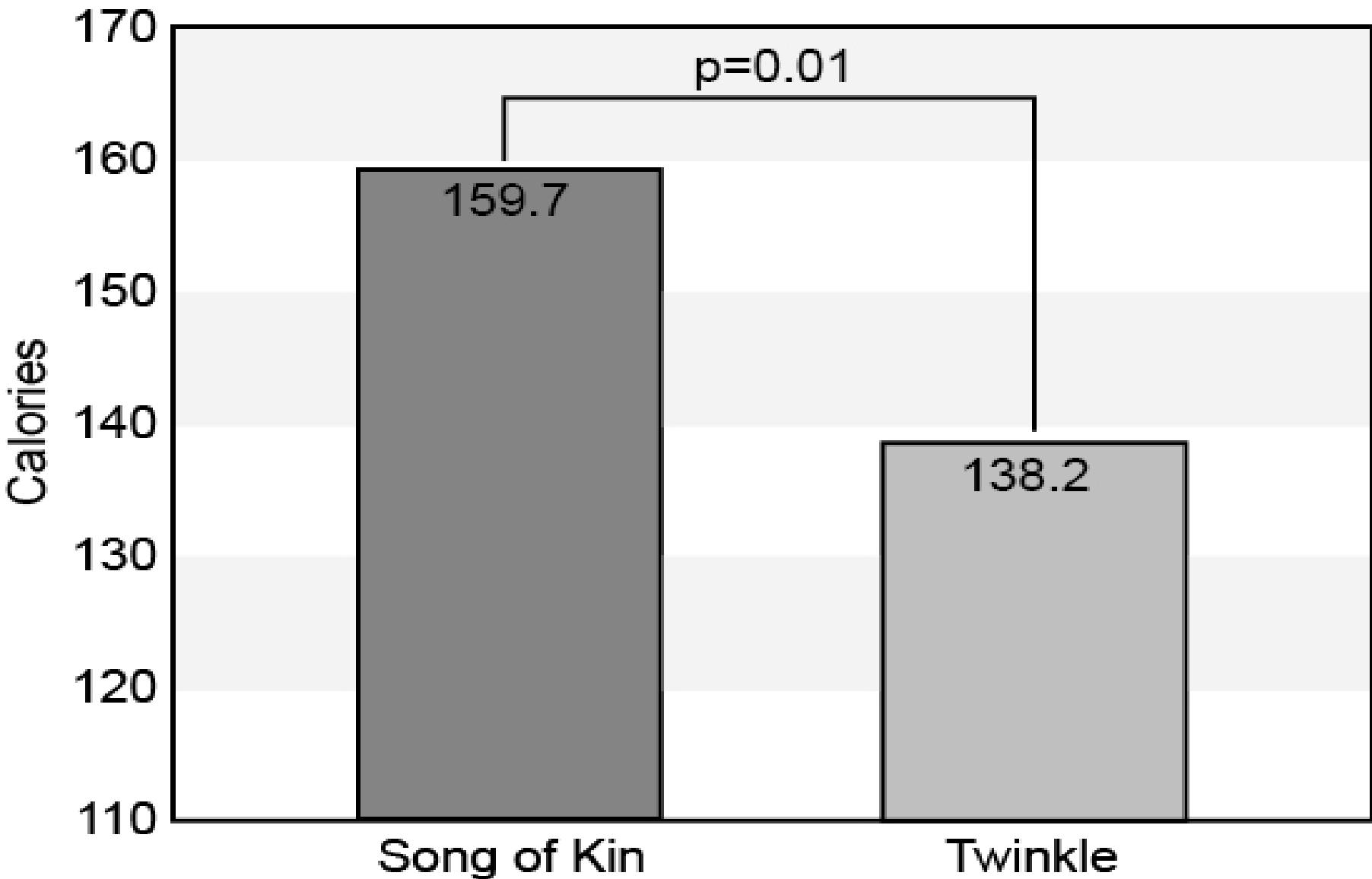
Oxygen Saturation



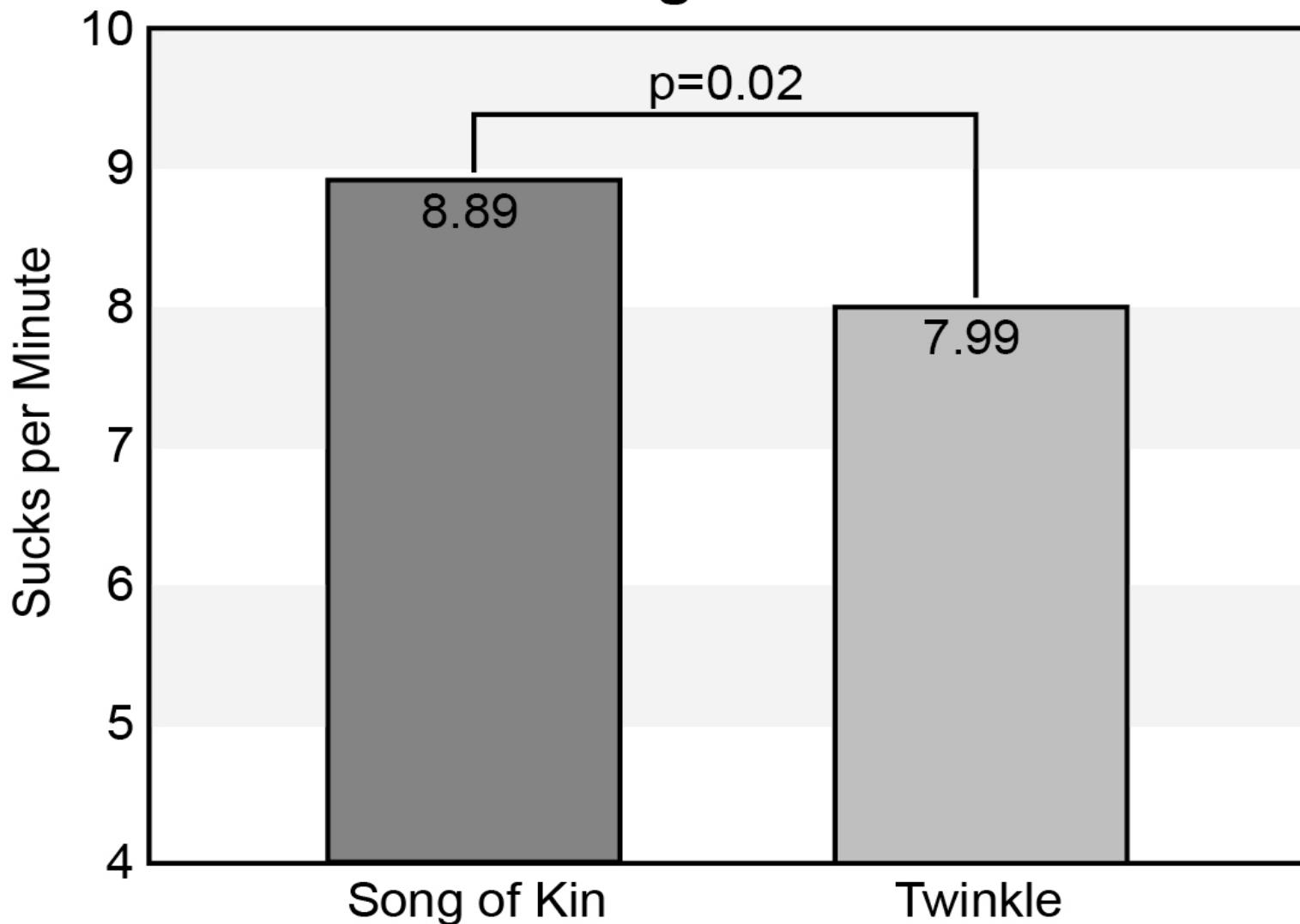
Sucking Behavior Over 2 Weeks



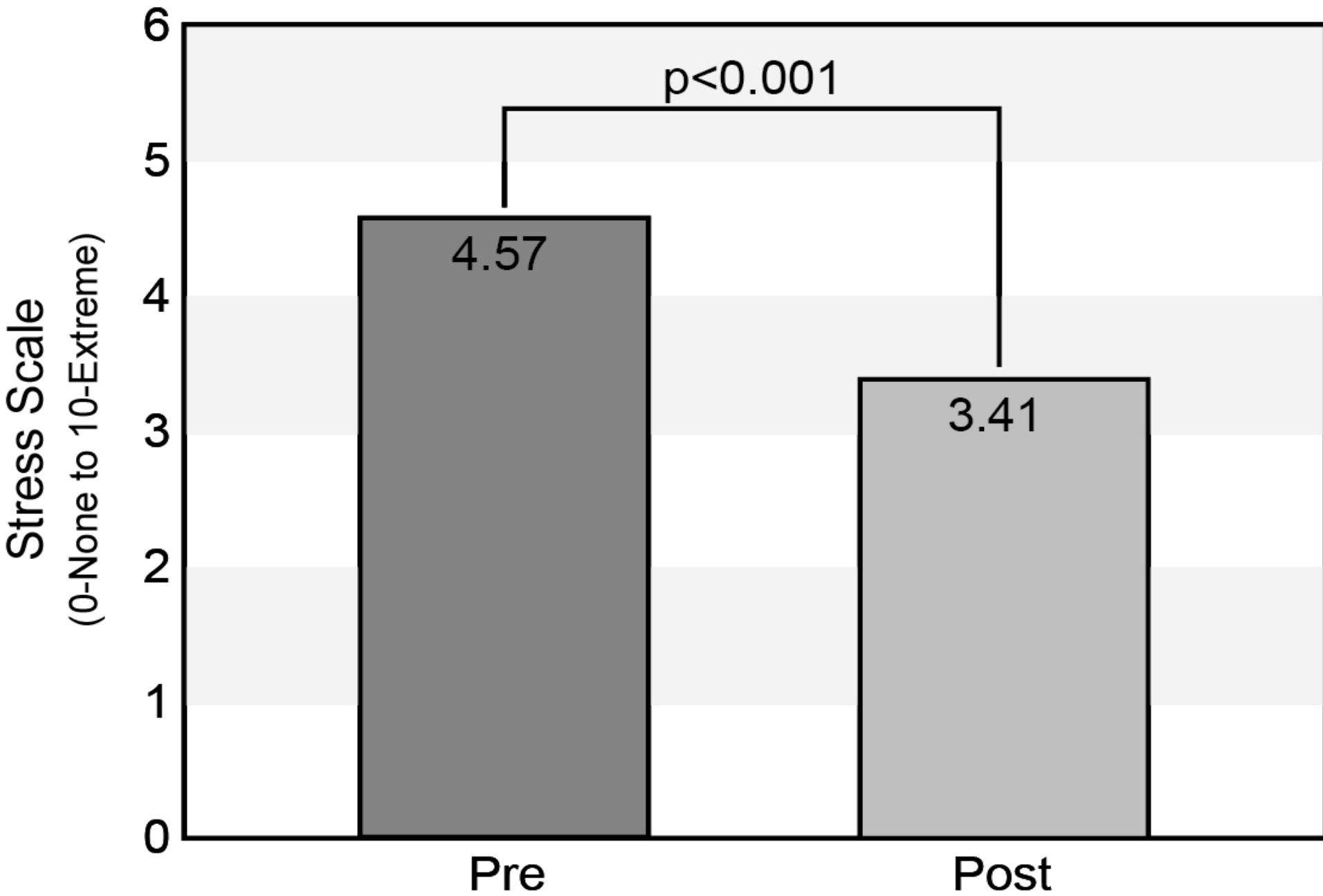
Caloric Intake



Feeding Behavior



Parental Stress



Introduction: Rhythm, Breath, Lullaby: NICU Music Therapy Training Program

Syllabus:

Part I: NICU Orientation	10 hours
A. Unit observation, psychosocial and medical rounds	
B. Unit policies, procedures, and protocol	
C. Charting D. Infant Diagnosis	
E. Treatment and Medical interventions F. Infant pain profile	
G. Preterm infant development H. Infant Behavioral states	
I. Understanding preterm infant signals J. Parent Reactions: Introduction	
K. Creating a parent recording in lieu of parental visitation	
* NICU Exam (a8)	
Part II: Music Therapy in the NICU- learning and observation	50 hours
<i>Infant session observations; parent/infant session observations</i>	
(to be completed at any site affiliated with an RBL music therapist)	
Clinical Interventions and music therapy goals	20 hours
Infant Intervention options:	
Ocean disc, Gato box, Lullaby and Songs of kin	
Contingent singing	
Parent/ caregiver areas: trauma, bonding and attachment	20 hours
Attunement, Grief	
NICU orals	30 minute
a. Phone interview	
b. Why/how/desired effect	
B. Required reading bibliography (attached)	10 hours
Part III: Integration and Intervention: music therapy	20 hours
and case studies with supervision	(to be completed within 1 year)
Five infant sessions conducted, with one observed (or filmed)	
Five parent/infant sessions conducted with one observed (or filmed)	
Two written and submitted case studies: 1 parent and baby, 1 baby	

First Sounds: Rhythm, Breath, Lullaby (RBL): NICU Music Therapy – 15 Countries Training Sites & Grandparents

Marcela Lichtensztein, *Argentina*
Christelle Jacquet, *Canada*
Claire Flower, *England*
Jane Edwards, *Ireland*
Cho Long Hahm, *Korea*
Melanie Kwan, *Singapore*
Nuria Escude, *Spain*
Maya Charlton, *USA, CA*
Andrew Rossetti, *USA, NY*
Amy Kessleth, *USA, Phila, PA*
Joanne Loewy, *USA, NYC*
Charlotte Pharr, *USA, NYC*
Deborah Benkovitz, *USA, PA*
Brian Schreck, *USA,, Ohio*
Theresa McManus, *USA, NY*
Wen Chang *USA, NYC*
Laurie Park, *USA, NY*

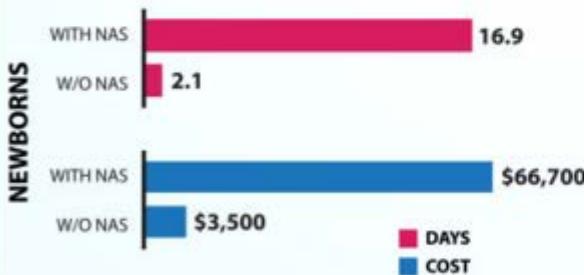
|
Helen Shoemark, *Australia*
Loting Chen, *China*
Friederike Haelbeck, *Switzerland*
Gabi Frank, *Israel*
Jisun Kim, *Korea*
Maria DeJesus, *Spain*
Alexandra Ullsten, *Sweden*
Susan Cotter-Schaufele, *USA, Chicago*
Deanna Hanson-Abromeit, *USA, Miss*
Angela Ferraiuolo, *USA, NYC*
John Mondanaro, *USA, NYC*
Kristen Stewart, *USA, NYC*
Paul Nolan, *USA, PA*
Danny Marain *USA, NY*
Christine Vaskas *USA, NYC*
Bernardo Canga, *USA, NYC*
Mark Ettenberg, *Peru*

THE USE OF OPIOIDS DURING PREGNANCY CAN RESULT IN A DRUG WITHDRAWAL SYNDROME IN NEWBORNS CALLED **NEONATAL ABSTINENCE SYNDROME (NAS)**, WHICH CAUSES LENGTHY AND COSTLY HOSPITAL STAYS. ACCORDING TO A NEW STUDY, AN ESTIMATED 21,732 BABIES WERE BORN WITH THIS SYNDROME IN THE UNITED STATES IN 2012, A **5-FOLD INCREASE** SINCE 2000.

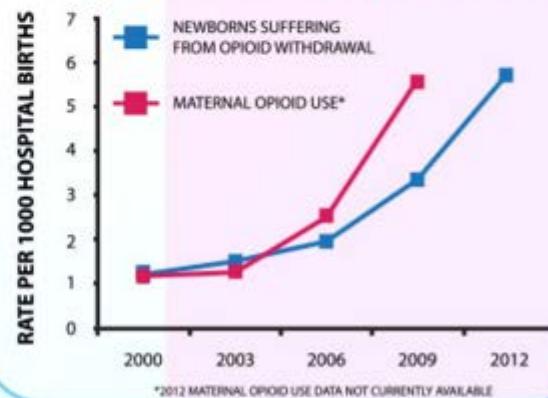


EVERY 25 MINUTES, A BABY IS BORN SUFFERING FROM OPIOID WITHDRAWAL.

AVERAGE LENGTH OR COST OF HOSPITAL STAY



NAS AND MATERNAL OPIOID USE ON THE RISE



National Institute
on Drug Abuse

Source: [Patrick et. Al., JAMA 2012](#), [Patrick et. Al., Journal of Perinatology 2015](#)

Hospitals in Participation with RBL Music Therapy and Research



- Cincinnati Children's Hospital
- Children's Hospital of Philadelphia (CHOP)
- Children's Hospital of Pittsburgh
- Hahnemann Hospital
- Bellevue Hospital
- PeaceHealth Southwest Medical Center
- Oregon Health Sciences University
- Oakland Hospital
- Maria Ferrai Children's Hospital
- Hackensack University Medical Center
- Stonybrook University Hospital
- Winthrop University Hospital
- McGill University Healthcare (Canada)
- Sentara Health Care
- Maimonides Hospital
- IUSM Riley Children's Hospital
- Northwell Health
- Penn State Hershey Medical Center
- Mount Sinai Health System

NOISE

Trend of ‘Noise’ in the Literature

- Short, A. **Using Music to Reduce Noise Stress for Patients in the Emergency Department: A Pilot Study**, *Music and Medicine October 2010* 2: 201-207
- Mazer, S. **Music, Noise, and the Environment of Care: History, Theory, and Practice**, *Music and Medicine July 2010* 2: 182-191.
- Schwartz, F. **A Pilot Study of Patients in Postoperative Cardiac Surgery**, *Music and Medicine July 2009* 1: 7074
- Murthy VS et al. **Auditory functions in anaesthesia residents during exposure to operating room noise**. In J Med Res 1995; 101: 213–6
- Allaouchiche, B. et al. **Noise in the postanaesthesia care unit**, *BJA*, 2012, 88, 3, 369-373

Environmental Factors



- ◆ Harmful Noise Levels
- ◆ Mechanical Sounds
- ◆ Harsh Lighting

*Canga, Hahm, Grossbard & Loewy, 2012
Mazer, 2010;
Mitchell, Macdonald, & Knussen, 2007;
Whitaker, 2010*



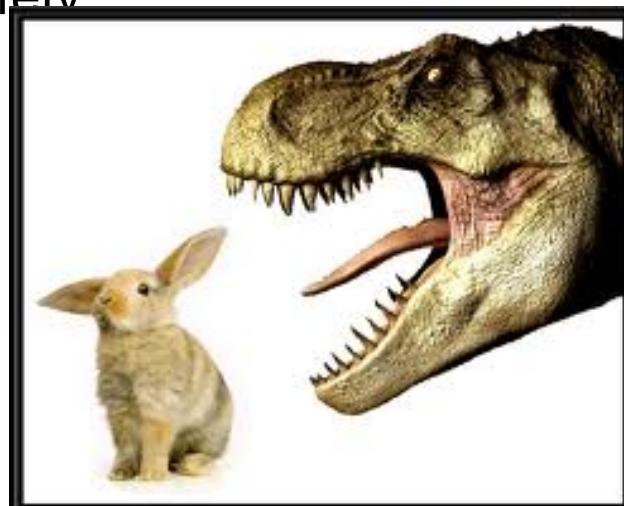
Noise = Stress

Noise as a stress factor:

More than merely annoying, noise in hospitals has been shown to be identified with specific risks. For example, noise is the single most prominent cause of sleep deprivation

Noise has been identified as a major cause of pain exacerbation and heightened disorientation

For the staff, noise increases stress levels, contributes to medical errors, and affects safety



Noise

Sources of noise equipment staff

Conversation 80 dB

IV pump alarm 60-78 dB

Tapping incubator with fingers 70-95 dB

Closing incubator drawer 70-95 dB

Closing plastic porthole 80-111 dB

Pulse oximeter alarm 55-65 dB

Effect on hearing

Behavioral and physiologic response

hypoxemia

increases in heart rate and respiratory rate

Effect on parents





Environmental Music Therapy: A Pilot Study on the Effects of Music Therapy in a Chemotherapy Infusion Suite

Music and Medicine
4(4) 221-230
© The Author(s) 2012
Reprints and permission:
sagepub.com/journalsPermissions.nav
DOI: [10.1177/1943862112462037](https://doi.org/10.1177/1943862112462037)
<http://mmd.sagepub.com>
 SAGE

**Bernardo Canga, MMT¹, Cho Long Hahm, MA²,
David Lucido, PhD³, Michael L. Grossbard, MD⁴,
and Joanne V. Loewy, DA, LCAT, MT-BC¹**

Abstract

Environmental music therapy (EMT) is a noninvasive mind-body intervention that considers the physical, psychological, and cultural needs of patients, caregivers, and staff. Quantitative and qualitative analyses of the effect of EMT on patients, caregivers, and staff revealed that EMT, involving the purposeful use of live music, showed positive effects on stress level and reduced the perception of noise in patients and caregivers when applied in common and treatment areas of the Cancer Center and outpatient infusion facility at a large inner-city hospital. Environmental music therapy attended to the immediate needs of patients and caregivers in a culturally sensitive way both prior to and during treatment. The present study additionally evaluates the effect of EMT's capacity to alleviate compassion fatigue and stress in oncologists, nurses, and other health professionals.

Keywords

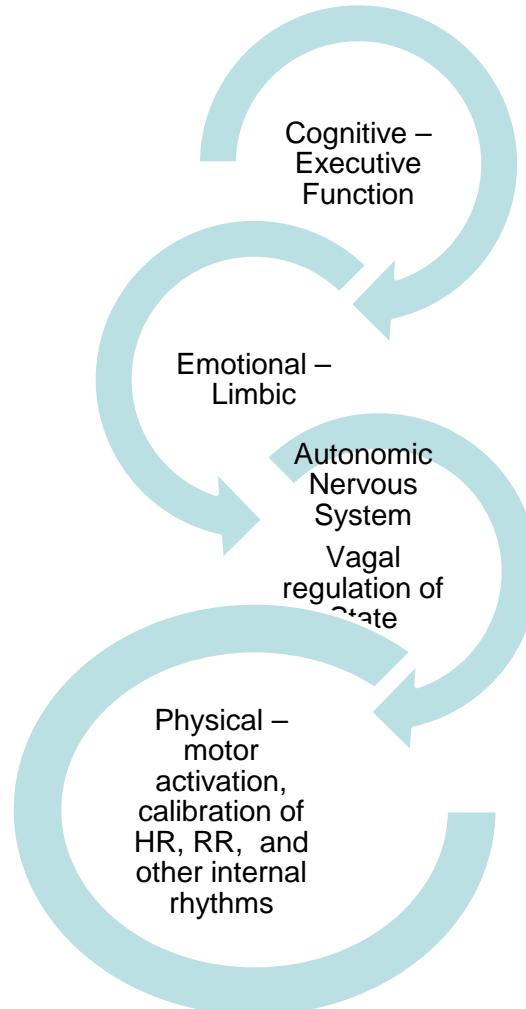
chemotherapy, music medicine, music therapy, oncology, burnout

- Assigning meaning to the music
- And creating a referential context for lyrics
- Identifying Metaphoric content





Systems Response to Music





MUSICAL SYNTAX PROCESSING (making sense of sound)



Integrating elements (melody, harmony, contour, rhythm, meter, timbre, expectation, intensity, instrumentation, etc.) into a perceivable (sometimes hierarchical) structure

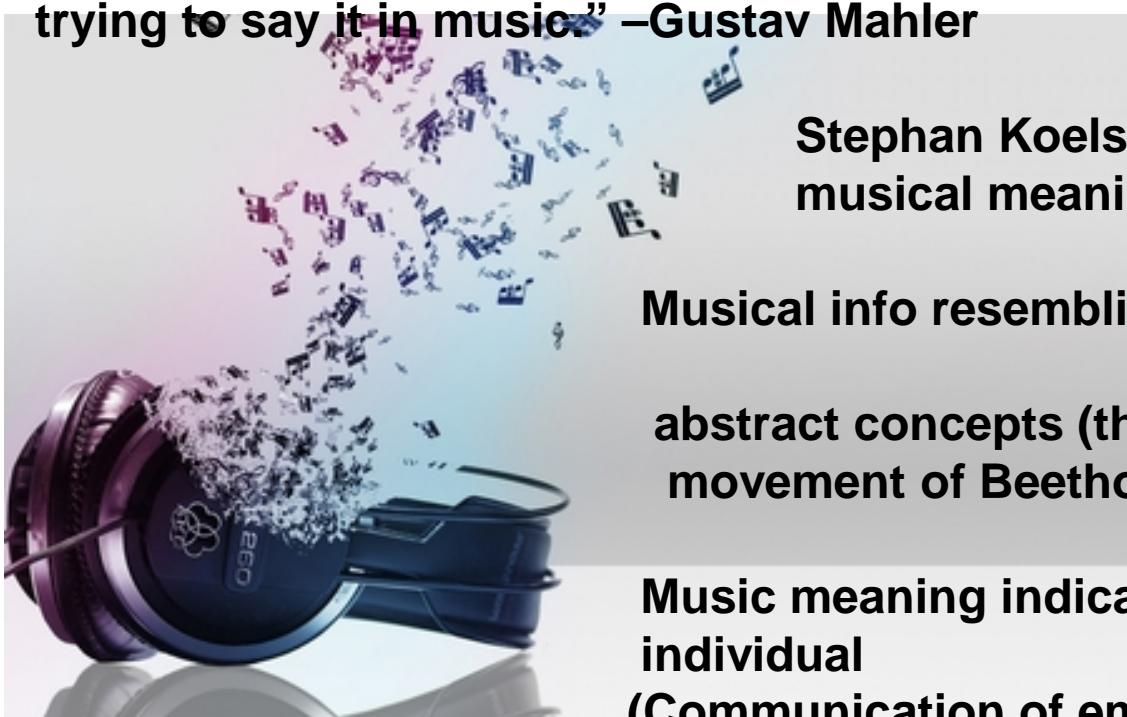
Considered to be cognitive processes

Culture may shape aspects of these processes



MUSICAL SEMANTICS (making sense of structured sound)

“If a composer could say what he had to say in words, he would not bother trying to say it in music.” –Gustav Mahler



Stephan Koelsch (2013) defined 3 classes of musical meaning:

Musical info resembling sounds of objects and

abstract concepts (thunderstorm in the 4th movement of Beethoven’s Pastoral)

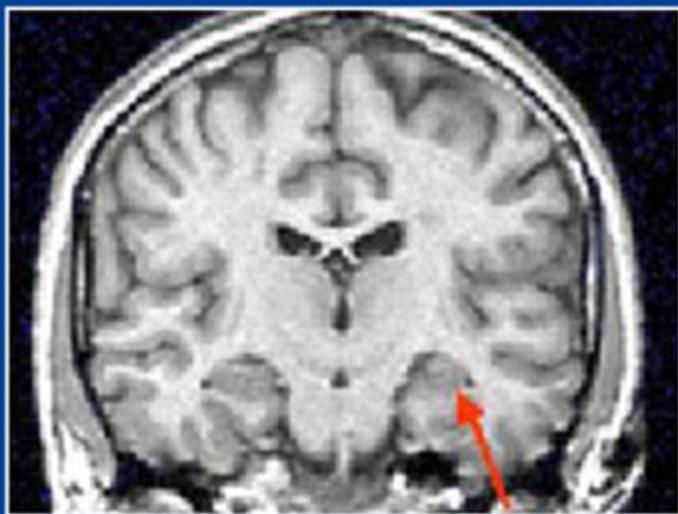
Music meaning indicating the inner state of an individual

(Communication of emotions via musical qualities)

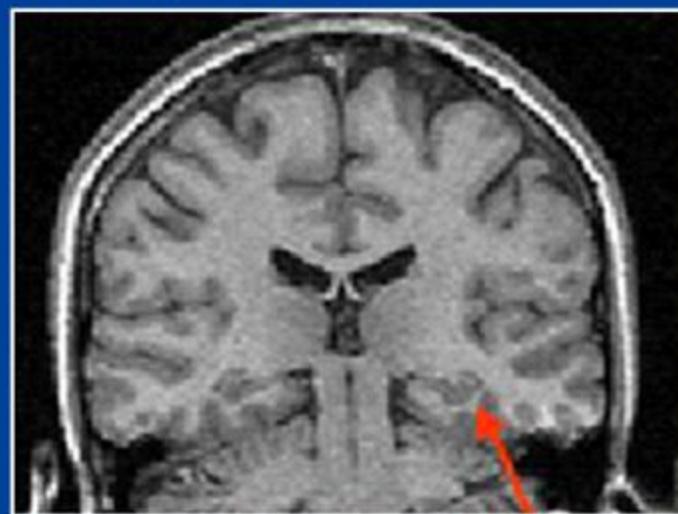
Arbitrary associations with music – national anthem, movie soundtrack

Potential impact of depression: Neurologic impairment

Atrophy of the Hippocampus in Depression



Control



Patient With Depression

- Compared to controls, patients with depression had smaller hippocampal volumes^{1,2,3}
- These patients also exhibited verbal memory deficits^{1,2}

1. Bremner JD, et al. *Am J Psychiatry*. 2000;157(1):115-118.
2. Sheline Y, et al. *J Neurosci*. 1999;19:5034-5043.
3. Neumeister A, et al. *Biol Psychiatry*. 2005;57:935-937.

Images reprinted with permission of JD Bremner.



Music Characterization System¹⁰

Music & Medicine | 2014 | Volume 6 | Issue 2 | Pages 70 – 77

Rossetti | Prescribed Music

Full-Length Article

Towards Prescribed Music in Clinical Contexts: *More Than Words*

Andrew Rossetti¹

¹Radiation Oncology Music Therapy Program, Mount Sinai Beth Israel, Louis Armstrong Center for Music & Medicine, New York, NY, USA

Abstract

The use of pre-recorded music has become status quo in a growing number of clinical music & medicine contexts. The process for choosing music used in both music therapy and music medicine interventions however has received surprisingly little attention in the literature, and might benefit from a more systematic approach. Applications made should ultimately provide for greater therapeutic efficacy. The following guidelines seek to contribute to the development of such a system in an effort to move toward a less arbitrary practice- thereby focusing greater attention to accurately match pre-recorded music to meet desired clinical goals. A systematic approach was developed and implemented in a music psychotherapy program which treated patients receiving radiation therapy for cancer in contexts in which the use of live music interventions were not feasible (e.g. during simulation for external beam radiation therapy and radiation therapy). The protocolized music therapy intervention that sought to address state anxiety in patients with cancer was examined in a randomized control study [1]. This article will describe a developing system resulting from this study, thereby qualifying the clinical context of how musical decisions are made.

Keywords: *Music therapy, prescribed music program, music characterization system, radiation oncology, state anxiety*

multilingual abstract | mmd.iammonline.com



Music Characterization System (MCS) Individual Elements

Tessitura:	Range between highest and lowest notes
Intensity:	Intensity is a combination of other musical traits, among them volume, rhythmic and harmonic complexity, and movement ("languid") to "ferocious").
Dynamic range:	The amount of change in the music, the diversity of its elements
Tempo:	How fast or slow
Harmonic simplicity/complexity:	This refers to the amount of harmonic movement.
Apparent volume:	The mixture of other musical elements (timbre, intensity, etc.) that contribute to perception of music as loud 'sounding' (as in rock or a full orchestra) to soft 'sounding' (as in a vocal lullaby, or solo acoustic instrument)
Rhythmic simplicity/complexity:	Refers to the frequency of syncopations present in the music as well as the variance in rhythms
Melodic contour:	Indicates intervallic movement in the melody.
Dissonance:	Equating dissonance with harmonic tension
Timbre:	Refers to the contrast of "sharpness" or "shriileness" as opposed to "mellowness" or "roundness" of the sound.
Structure:	This refers to the existence of musical structure in contrast to its absence.
Predictability:	Refers to the sensation of 'logical' harmonic, melodic and rhythmic movement that complies with our expectation in the flow of the music

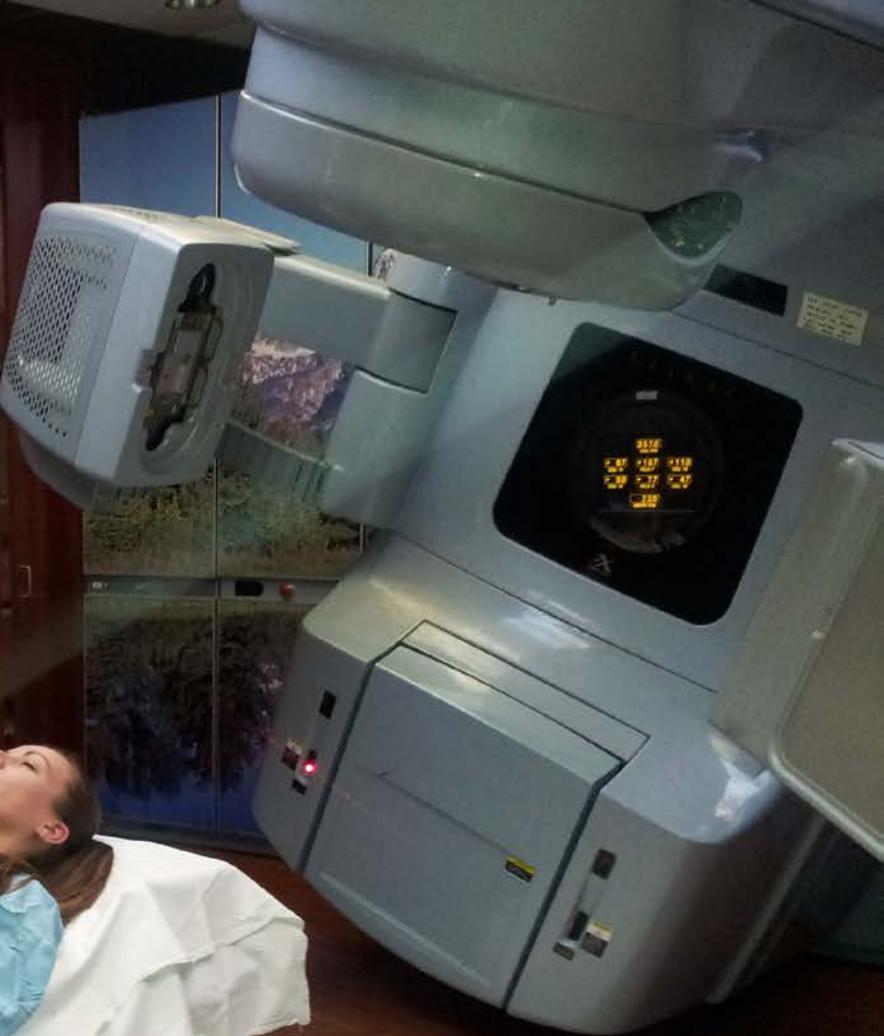
Non-musical Elements

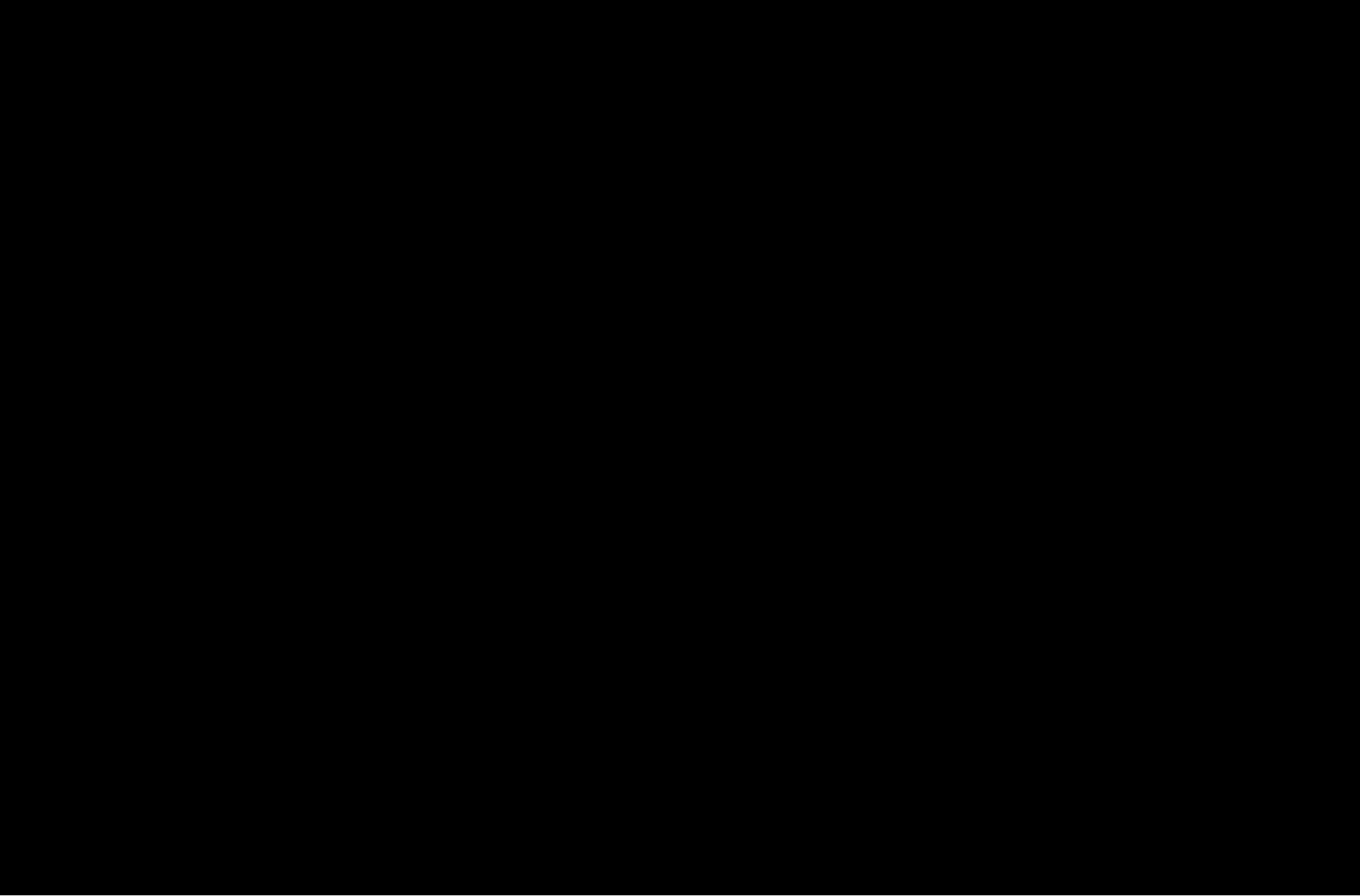
Perceived Emotional Content:	To avoid current emotion science polemics, this refers to descriptors drawn from the common lay perception of emotions i.e. depressing, sad, melancholy, neutral, happy, joyous, ecstatic, etc.
General Descriptors:	i.e. placid, building, stately, complex, aggressive, etc.
Predominant Musical Metaphors/Imagery:	Can include literal or non-literal music metaphors and images encountered in or invoked by the music. This may be thought of also as "messages in the music."



Protocolized Music Psychotherapy Intervention: Reducing State Anxiety Prior to Simulation









International Journal of Radiation Oncology*Biology*Physics

Available online 8 May 2017

In Press, Accepted Manuscript — Note to users



Clinical Investigation

The Impact of Music Therapy (MT) on Anxiety in Cancer Patients Undergoing Simulation for Radiation Therapy (RT)

Andrew Rossetti, MMT, LCAT, MT-BC, Manjeet Chadha, MD, FACR,
ASTRO,

B. Nelson Torres, MPH, Jae K. Lee, PhD, Donald Hylton, AAS, RTT,
Joanne V. Loewy, DA, LCAT, MT-BC, Louis B. Harrison, MD, ASTRO

Purpose: Radiation therapy (RT) is associated with high stress levels. The role of MT in patients receiving RT is not well described. This study evaluates the impact of MT on newly diagnosed head & neck, and breast cancer patients' anxiety and distress during simulation.

Recent Articles from ‘Music & Medicine’



The Neural Correlates of Temporal Structure in Music

Daniel J. Levitin PhD

Effects of Music on Physiological and Behavioral Indices of Acute Pain and Stress in Premature Infants: a Literature Review and Experimental Study

Mark Tramo MD, PhD, Miriam Lense PhD cand; Caitlin Vanness MST
Jerome Kagan, PhD, Margaret Doyle Settle RNC, MSN, Jonathan Cronin MD

The Role of Music and Music Therapy in Aphasia Rehabilitation

Meghan L. Hartley MA, LCAT, MT-BC, Alan Turry DA, LCAT, NRMT
Preeti Raghavan MD

Biased Emotional Preferences in Depression: Decreased Liking of Angry and Energetic Music by Depressed Patients

Marko Punkanen PhD, Tuomas Eerola PhD, Jaakko Erkkilä PhD

Stabilization Music Therapy Model and Process: 512 China Sichuan Earthquake Crisis Interventions

Jennifer Hsiao-Ying Tiao Shih MT

Register for online access at mmd.iammonline.com

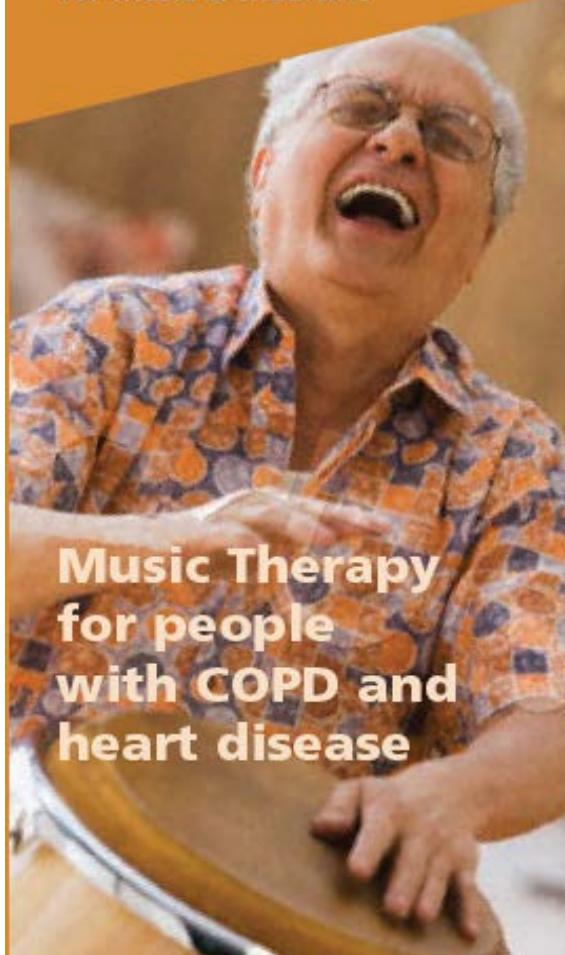


Mount
Sinai
Beth Israel

Come visit ...



The Louis Armstrong Center
for Music & Medicine



**Music Therapy
for people
with COPD and
heart disease**

The Louis Armstrong Center
for Music & Medicine

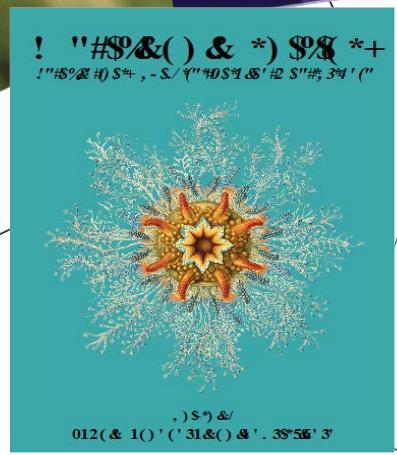
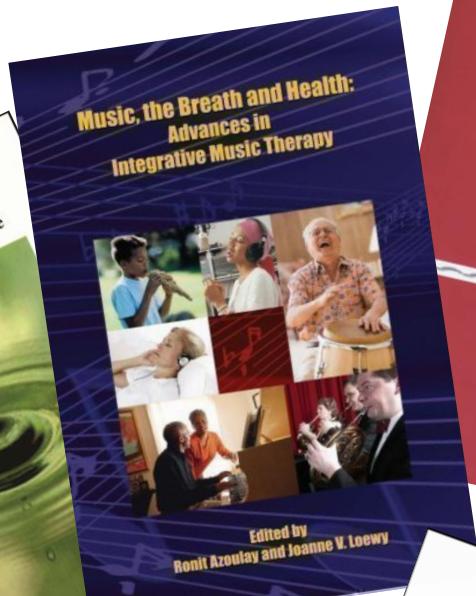
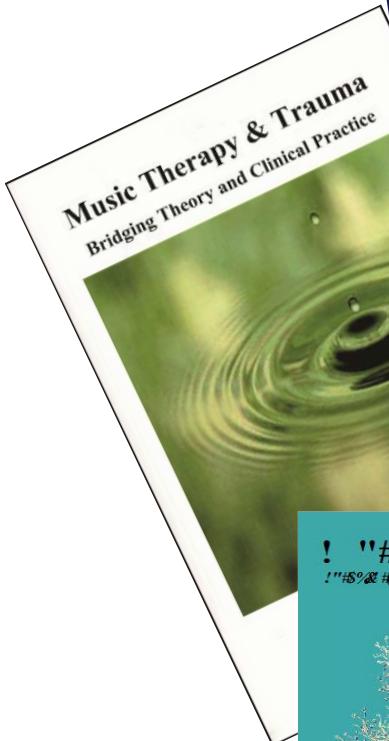


**Music Therapy
for Kids and Teens
with Asthma**

The Louis Armstrong Center
for Music & Medicine



**Music &
Health Clinic for
musicians and
performing artists**



Our publications

To join:

International Association for Music & Medicine

iammonline.com





Contact Info & Training

Joanne Loewy DA, LCAT, MT-BC

Joanne.Loewy@mountsinai.org

Telephone: 1.212.420-2704

Mailing Address: Mount Sinai Beth Israel

Louis Armstrong Ctr Music & Medicine

6 Silver 21- 1st Ave & 16th St

NY, NY 10003 Website:

www.musicandmedicine.org

We offer trainings for MDs, RNs and others. 2 day, weekly and monthly orientations and observations-hands on experiences.

To join: [International Association for Music & Medicine](http://www.iammonline.com)

www.iammonline.com June Barcelona 2018