

# The Benefits of Live Therapeutic Music in Health Care

## Selected Research Abstracts

Compiled 2006 by Melinda Gardiner, RN, CMP

### 1. Hospice/Palliative care:

#### **Restoring the spirit at the end of life: music as an intervention for oncology nurses.**

**Halstead MT, Roscoe ST.** [mhalstead@towson.edu](mailto:mhalstead@towson.edu)

Clin J Oncol Nurs. 2002 Nov-Dec;6(6):332-6.

Music is a useful therapeutic intervention that can improve quality of life for dying patients. Physiologic mechanisms in response to carefully chosen musical selections help to alleviate pain, anxiety, and nausea and induce sleep. Expression of feelings enhances mood. Palliative care nurses increase the effectiveness of this intervention through careful assessment of patient needs, preferences, goals of intervention, and available resources. Music, a universal language, is an important clinical adjunct that addresses individual and family needs, thereby assisting patients to achieve a peaceful death. This article explores musical categories of preferences to assist nurses, patients, and families in choosing music that meets specific therapeutic objectives.

PMID: 12434464 [PubMed - indexed for MEDLINE]

#### **Music therapy with persons who are indigent and terminally ill.**

**Mramor KM.** Malachi House, Cleveland, Ohio, USA.

J Palliat Care. 2001 Autumn;17(3):182-7.

This paper addresses the music therapy process specific to one subgroup of the general population identified as having terminal illness. This subgroup includes individuals who are impoverished, homeless, and do not have someone to provide them with care at the end of life. Based upon her clinical work at Malachi House, the author identified three distinct phases of the music therapy process with these individuals: engagement, relationship building, and actively dying. The progress of 50 residents through the therapy process was documented over a three-year period, as was the musical and nonmusical content of music therapy sessions. This paper reviews the results of the documentation recorded and offers case examples to represent each phase.

PMID: 1116760 [PubMed - indexed for MEDLINE]

#### **The effects of music therapy on the quality and length of life of people diagnosed with terminal cancer.**

**Hilliard RE.** Florida State University, Big Bend Hospice, USA.

J Music Ther. 2003 Summer;40(2):113-37.

The purpose of this study was to evaluate the effects of music therapy on quality of life, length of life in care, physical status, and relationship of death occurrence to the final music therapy interventions of hospice patients diagnosed with terminal cancer. Subjects were adults who were living in their homes, receiving hospice care, and were diagnosed with terminal cancer. A total of 80 subjects participated in the study and were randomly assigned to one of two groups: experimental (routine hospice services and clinical music therapy) and control (routine hospice services only). Groups were matched on the basis of gender and age. Quality of life was measured by the Hospice Quality of Life Index-Revised (HQOLI-R), a self-report measure given every visit. Functional status of the subjects was assessed by the hospice nurse during every visit using the Palliative Performance Scale. All subjects received at least two visits and quality of life and physical status assessments. A repeated measures ANOVA revealed a significant difference between groups on self-report quality of life scores for visits one and two. Quality of life was higher for those subjects receiving music therapy, and their quality of life increased over time as they received more music therapy sessions. Subjects in the control group, however, experienced a lower quality of life than those in the experimental group, and without music, their quality of life decreased over time. There were no significant differences in results by age or gender of subjects in either condition. Furthermore, there were no significant differences between groups on physical functioning, length of life, or time of death in relation to the last scheduled visit by the music therapist or counselor. This study provides an overview of hospice/palliative care, explains the role of music therapy in providing care, and establishes clinical guidelines grounded in research for the use of music therapy in improving the quality of life among the terminally ill. PMID: 14505443 [PubMed - indexed for MEDLINE]

**On a personal note: a music therapist's reflections on working with those who are living with a terminal illness. Hartley NA.** J Palliat Care. 2001 Autumn;17(3):135-41.

Music therapists are constantly called upon to justify their work through research projects and evaluation processes. Rarely do we get the opportunity to talk personally about our work, the effects it has on us as music therapists, indeed, as human beings. This paper traces my own journey as a music therapist working with the terminally ill. Using audio extracts of music improvised with patients at the end of their lives, the concept of "attention" in music is addressed and explored. The paper will investigate: a) What is the difference between the quality of attention that is available to ourselves and our patients "in" music, as opposed to other ways of being together?; b) What does musical experience, particularly when achieved through improvisation, enable us and our patients to be that we cannot achieve in other ways?; c) Can "being in music" with another person fulfill a sense of longing that is evident in people at the end of their lives? In her book *Waiting For God*, Simone Weil suggests, "Those who are unhappy have no need for anything else in this world other than people capable of giving them their attention..." (1). Can the improvisation of music offer a unique and uncomplicated medium for being close?

PMID: 11816752 [PubMed - indexed for MEDLINE]

**Music therapy as psychospiritual process in palliative care.**

**Salmon D.** McGill University Health Centre, Palliative Care Service, Royal Victoria Hospital, Montreal, Quebec, Canada. J Palliat Care. 2001 Autumn;17(3):142-6.

This paper proposes a theoretical framework for understanding how music therapy elicits and supports depth experiences in palliative care. The author explores music therapy as a containing or sacred space in which ventures into the realm of psychospiritual awareness may safely occur. The ultimate goal is to facilitate the process of connecting to that which is psychologically and spiritually significant for the patient, thereby transforming experiences of suffering into those of meaning.

PMID: 11816753 [PubMed - indexed for MEDLINE]

**Music therapy in palliative medicine.**

**Gallagher LM, Huston MJ, Nelson KA, Walsh D, Steele AL.**

Support Care Cancer. 2001 May;9(3):156-61.

The Harry R. Horvitz Center for Palliative Medicine, Cleveland Clinic, Taussig Cancer Center, Ohio 44195, USA.

A partnership between The Cleveland Clinic Foundation and The Cleveland Music School Settlement has resulted in music therapy becoming a standard part of the care in our palliative medicine inpatient unit. This paper describes a music therapy program and its impact on patients, their families, and staff. A service delivery model is suggested for implementation and integration of music therapy within palliative medicine. Specific music therapy interventions, evaluation and documentation techniques are also mentioned. A description of patient and family responses to music therapy, staff satisfaction, and effectiveness of interventions is presented.

PMID: 11401099 [PubMed - indexed for MEDLINE]

**Restoring the spirit at the end of life: music as an intervention for oncology nurses.**

Clin J Oncol Nurs 2002 Nov-Dec;6(6):332-6 (ISSN: 1092-1095)

Halstead MT; Roscoe ST mhalstead@towson.edu.

Music is a useful therapeutic intervention that can improve quality of life for dying patients. Physiologic mechanisms in response to carefully chosen musical selections help to alleviate pain, anxiety, and nausea and induce sleep. Expression of feelings enhances mood. Palliative care nurses increase the effectiveness of this intervention through careful assessment of patient needs, preferences, goals of intervention, and available resources. Music, a universal language, is an important clinical adjunct that addresses individual and family needs, thereby assisting patients to achieve a peaceful death. This article explores musical categories of preferences to assist nurses, patients, and families in choosing music that meets specific therapeutic objectives.

**Music therapy in palliative care: current perspectives.**

Int J Palliat Nurs 2002 Mar;8(3):130-6 (ISSN: 1357-6321) O'Kelly J

Rowcroft, The Torbay and South Devon Hospice, Torquay, UK. As the music therapy profession has developed internationally over the last 25 years, so has its role in palliative care. Music is a highly versatile and dynamic therapeutic modality, lending itself to a variety of music therapy techniques used to benefit both those living with life-threatening illnesses and their family members and caregivers. This article will give a

broad overview of the historical roots of music therapy and introduce the techniques that are employed in current practice. By combining a review of mainstream music therapy practice involving musical improvisation, song-writing and receptive/recreational techniques with case material from my own experience, this article aims to highlight the potential music therapy holds as an effective holistic practice for palliative care, whatever the care setting.

**The use of music therapy in meeting the multidimensional needs of hospice patients and families.**

J Palliat Care 2001 Autumn;17(3):161-6 (ISSN: 0825-8597) Hilliard RE

Big Bend Hospice, Tallahassee, Florida, USA. This article presents four case studies which demonstrate the use of music therapy in assisting palliative care patients and families cope with grief and loss, pain and anxiety, disorientation and dementia, lack of meaning, and hopelessness. Music therapy techniques are illustrated and patient-related goals are defined within the case studies. A review of the literature supports the use of music therapy in palliative care, and a variety of qualitative and quantitative studies are reported in the article.

**Music therapy as psychospiritual process in palliative care.**

J Palliat Care 2001 Autumn;17(3):142-6 (ISSN: 0825-8597) Salmon D

McGill University Health Centre, Palliative Care Service, Royal Victoria Hospital, Montreal, Quebec, Canada. This paper proposes a theoretical framework for understanding how music therapy elicits and supports depth experiences in palliative care. The author explores music therapy as a containing or sacred space in which ventures into the realm of psychospiritual awareness may safely occur. The ultimate goal is to facilitate the process of connecting to that which is psychologically and spiritually significant for the patient, thereby transforming experiences of suffering into those of meaning.

**Bringing music to life: a study of music therapy and palliative care experiences in a cancer hospital.**

J Palliat Care 2001 Autumn;17(3):155-60 (ISSN: 0825-8597) O'Callaghan C

Peter MacCallum Cancer Institute, University of Melbourne, Melbourne, Australia. A music therapy research study aimed at understanding patients', visitors' and staff members' experiences of a music therapy program in a cancer hospital over a three-month period is described. Respondents' answers to brief open-ended questions, as well as the music therapist researcher's interpretations of the program's relevance, were examined using thematic analysis based on grounded theory. ATLAS software supported data management and analysis. Themes encapsulating 128 patients' reflections about music therapy were delineated and substantiate how music therapy can support palliative care aims throughout the cancer illness trajectory.

**The effects of single-session music therapy interventions on the observed and self-reported levels of pain control, physical comfort, and relaxation of hospice patients.**

Am J Hosp Palliat Care 2001 Nov-Dec;18(6):383-90 (ISSN: 1049-9091) Krout RE

Hospice of Palm Beach County, West Palm Beach, Florida, USA.

This article describes the process and results of a three-month music therapy clinical effectiveness study conducted with terminally ill patients. The purpose of this study was to quantify and evaluate the effectiveness of single-session music therapy interventions with hospice patients in three patient problem areas: pain control; physical comfort; and relaxation. Data from a total of 90 sessions conducted with a total of 80 subjects served by Hospice of Palm Beach County, Florida, were included in the study. Music therapy services were provided by five board-certified music therapists and one music therapist eligible for board certification. The subjects in this study were receiving regularly scheduled music therapy services from the hospice organization. The study used both behavioral observation and subject's self-reporting as methods of data reporting and recording. Subjects were observed for, or self-reported, their levels of pain control, physical comfort, and relaxation, both before and after each music therapy session. The subjects were served in the environments where music therapy services would normally be delivered (i.e., home, hospital, nursing home, or inpatient acute-care unit of the hospice organization). Music therapy services included live active and passive music-based experiences. These were designed to build and to establish rapport with patient or family, to facilitate family interaction and patient control, to provide support and comfort, to facilitate relaxation, to enable reminiscence and life review, to provide a frame-work for spiritual exploration and validation, and to encourage the identification and expression of feelings of anticipatory mourning and grief. A total of six hypotheses stated that there would be significant pre- to postsession differences in each of the three variables: pain control, physical comfort, and relaxation, as measured during two different session and

data collection scenarios. These scenarios included the independent observation and recording of the three subject variables and the subject's self-report of each variable. Reliability correlation coefficients were calculated for each of the different session and data-collection scenarios to help assess the correlation between primary and reliability observers. Pearson product moment correlations indicated reliability agreement coefficients of  $r = .85$  and  $r = .90$ . One-tailed t-tests were performed on the collected data for subject pain control, physical comfort, and relaxation. Results of the t-tests were significant at the  $p < \text{or} = .001$  (for observed pain control, physical comfort, and relaxation) and  $p < \text{or} = .005$  (for self-reported pain control, physical comfort, and relaxation) levels. These results suggest that single-session music therapy interventions appear to be effective in increasing subject pain control, physical comfort, and relaxation during both data collection scenarios. Based on the results of these tests of the analyzed data, the hypotheses were all accepted. Tables illustrate pre- to post-session changes in levels of all three variables from both session and data-collection scenarios. Copies of the data-collection forms are also included in the Appendix. The discussion section addresses limitations of this study and suggestions for future studies.

### **Music therapy in palliative medicine.**

Support Care Cancer 2001 May;9(3):156-61 (ISSN: 0941-4355) Gallagher LM; Huston MJ; Nelson KA; Walsh D; Steele AL

The Harry R. Horvitz Center for Palliative Medicine, Cleveland Clinic, Taussig Cancer Center, Ohio 44195, USA. A partnership between The Cleveland Clinic Foundation and The Cleveland Music School Settlement has resulted in music therapy becoming a standard part of the care in our palliative medicine inpatient unit. This paper describes a music therapy program and its impact on patients, their families, and staff. A service delivery model is suggested for implementation and integration of music therapy within palliative medicine. Specific music therapy interventions, evaluation and documentation techniques are also mentioned. A description of patient and family responses to music therapy, staff satisfaction, and effectiveness of interventions is presented.

### **Music therapy with imminently dying hospice patients and their families: facilitating release near the time of death**

Am J Hosp Palliat Care 2003 Mar-Apr;20(2):129-34 (ISSN: 1049-9091)

Krout RE

Conservatorium of Music, Massey University, Mt. Cook, Wellington, New Zealand.

Hospice care seeks to address the diverse needs of terminally ill patients in a number of physical, psychosocial, and spiritual areas. Family members of the patient often are included in the care and services provided by the hospice team, and hospice clinicians face a special challenge when working with families of patients who are imminently dying. When loved ones are anticipating the patient's impending death, they may find it difficult to express feelings, thoughts, and last wishes. Music therapy is a service modality that can help to facilitate such communication between the family and the patient who is actively dying, while also providing a comforting presence. Music therapy as a way to ease communication and sharing between dying patients and their loved ones is discussed in this article. The ways in which music therapy can facilitate a means of release for both patients and family members in an acute care unit of a large US hospice organization are specifically described. Case descriptions illustrate how music therapy functioned to allow five patients and their families to both come together and let go near the time of death. Elements to consider when providing such services to imminently dying patients and their families are discussed.

## **2. Medical/Surgical:**

### **Music Therapy and patients on Respirators**

Intensive Crit Care Nurs. 2003; 19(1):21-30 (ISSN: 0964-3397)

Almerud S; Petersson K Department of Anaesthesiology and Intensive Care, Central Hospital, SE-351 85 Växjö, Sweden. sofia.almerud@telia.com

The aim of this study was to ascertain whether music therapy had a measurable relaxing effect on patients who were temporarily on a respirator in an intensive care unit (ICU) and after completion of respirator treatment investigate those patients' experiences of the music therapy. In the study both quantitative and qualitative measurements were applied. Twenty patients were included using consecutive selection. It became apparent that the patients remembered very little of their time in ICU. The analysis of the quantitative data showed a significant fall in systolic and diastolic blood pressure during the music therapy

session and a corresponding rise after cessation of treatment. All changes were found to be statistically significant. The conclusion was that intensive care nursing staff can beneficially apply music therapy as a non-pharmacological intervention.

### **Using massage and music therapy to improve postoperative outcomes**

AORN J 2003 Sep;78(3):433-42, 445-7 (ISSN: 0001-2092)

McRee LD; Noble S; Pasvogel A

University of Arizona College of Nursing, Tucson, USA.

An experimental pilot study was conducted to investigate the effects of preoperative massage and music therapy on patients' preoperative, intraoperative, and postoperative experiences. Participants were assigned randomly to one of four groups--a group that received massage with music therapy, a group that received massage only, a group that received music therapy only, or a control group. Hemodynamics, serum cortisol and prolactin levels, and anxiety were measured preoperatively and postoperatively. Postoperative anxiety levels were significantly lower and postoperative prolactin levels were significantly higher for all groups

### **Cultural Differences in Music Chosen for Pain Relief**

Good M.[1]; Picot B.L.[2]; Salem S.G.[1]; Chin C-C.[3]; Picot S.F.[4]; Lane D.[5]

[1] Case Western Reserve University [2] University of North Carolina-Chapel Hill [3] Kaoshiung Medical University [4] University of Maryland, Baltimore [5] University Hospitals of Cleveland

Nurses use music therapeutically, but often assume that all patients will equally appreciate the same type of music. Cultural differences in music preferences are compared across five pain studies. Music preferences for pain relief are described as the most frequently chosen type of music for each culture. Findings indicate that in four studies musical choices were related to cultural background ( $p = .002$  to  $.049$ ). Although the majority in each group chose among the other types of music, Caucasians most frequently chose orchestra music, African Americans chose jazz, and Taiwanese chose harp music. For culturally congruent care, nurses should become aware of cultural differences in music preference and provide culturally specific selections amongst other music expected to have a therapeutic effect.

### **Music as an adjunct to antiemetic therapy.**

Oncol Nurs Forum 1998 Oct;25(9):1551-6, Ezzone S; Baker C; Rosselet R; Terepka E

To test whether use of music as a diversional intervention during high-dose chemotherapy administration would affect perception of nausea and episodes of vomiting. **SAMPLE:** 39 patients undergoing bone marrow transplant. A total of 33 patients were included in the data analysis, with 17 in the control group and 16 in the music intervention group. **METHODS:** Patients were assigned randomly to a control group (usual antiemetic protocol) or the experimental group (usual antiemetic group plus music intervention during the 48 hours of high-dose cyclophosphamide administered as part of the preparative regimen). **MAIN RESEARCH VARIABLES:** Use of a music intervention, perception of nausea, and instances of vomiting. **FINDINGS:** Significant differences were found between group scores on a visual analog scale for nausea and number of episodes of vomiting, demonstrating that the experimental group experienced less nausea and fewer instances of vomiting. **CONCLUSION:** This study found that music is an effective adjunct to a pharmacologic antiemetic regimen for lessening nausea and vomiting, and this study merits further investigation through a larger multi-institutional effort. **IMPLICATIONS FOR NURSING PRACTICE:** Using music as a diversional adjunct intervention to antiemetic therapy is helpful in decreasing nausea and vomiting. The intervention can be initiated independently by nurses and individualized for each patient, leading to greater patient comfort and compliance with high-dose chemotherapy.

### **Music in hospitals**

Lindsay S.

Br J Hosp Med. 1993 Dec 15-1994 Jan 18;50(11):660-2.

Council for Music in Hospitals, Hersham, Surrey.

Live music may be enjoyed by patients in hospitals, homes, hospices, training centres, stroke clubs and so on. This article discusses the provision of high quality concerts for those who--through age, illness or the nature of their disability--are precluded from attending a performance in the community and the benefits it brings them.

PMID: 8124548 [PubMed - indexed for MEDLINE]

### **Music as a therapeutic intervention for anxiety in patients receiving radiation therapy.**

Smith M, Casey L, Johnson D, Gwede C, Riggan OZ.

Oncol Nurs Forum. 2001 Jun;28(5):855-62.

Geriatric Psychiatry Department, James A. Haley Veterans Affairs Medical Center, Tampa, USA.

**PURPOSE/OBJECTIVES:** To determine whether music moderates the level of anxiety that patients experience during radiation therapy. **DESIGN:** Experimental, longitudinal, random assignment to music or no music therapy. **SETTING:** Urban radiation oncology center in a Department of Veterans Affairs hospital in the southeastern United States. **SAMPLE:** Forty-two men (19 in the experimental group, 23 in the control group) aged 39-80 years (74% white, 12% African American, 12% Hispanic, and 2% other) receiving definitive external beam radiation therapy for pelvic or abdominal malignancies. **METHODS:** Patients in the experimental group listened to music of their choice provided via audiotapes and headphones before and during their simulation and daily treatments for the duration of the planned course of therapy. The control group received standard care. The State-Trait Anxiety Inventory was administered initially to participants in both groups at the time of evaluation (time 1), post-simulation (time 2), at the end of the first week (time 3), at the end of the third week (time 4), and at the end of the fifth week or end of radiation therapy (time 5). **MAIN RESEARCH VARIABLE:** State anxiety. **FINDINGS:** No significant difference existed between the two groups to suggest that music moderated the level of anxiety during radiotherapy. However, post-hoc analyses identified changes and trends in state anxiety scores, suggesting a possible benefit of music therapy during radiotherapy. **CONCLUSIONS:** Despite a lack of group differences, early intervention with music therapy for patients with high levels of anxiety may be beneficial. **IMPLICATIONS FOR NURSING PRACTICE:** Nurses and other clinicians may administer state anxiety scales at the initial visit or prior to pretreatment radiation planning (simulation). Individuals who have high state anxiety scores may receive nursing interventions tailored to reduce anxiety during simulation and the early part of radiotherapy.

### **Effects of relaxation and music therapy on patients in a coronary care unit with presumptive acute myocardial infarction.**

Guzzetta CE. Holistic Nursing Consultants, Washington, D.C.

Heart Lung. 1989 Nov;18(6):609-16.

The purpose of this study was to determine whether relaxation and music therapy were effective in reducing stress in patients in a coronary care unit admitted with the presumptive diagnosis of acute myocardial infarction. In this experimental study, 80 patients were randomly assigned to a relaxation, music therapy, or control group. The relaxation and music therapy groups participated in three sessions over a two-day period. Stress was evaluated by apical heart rates, peripheral temperatures, cardiac complications, and qualitative patient evaluative data. Data analysis revealed that lowering apical heart rates and raising peripheral temperatures were more successful in the relaxation and music therapy groups than in the control group. The incidence of cardiac complications was found to be lower in the intervention groups, and most intervention subjects believed that such therapy was helpful. Both relaxation and music therapy are effective modalities to reduce stress in these patients.

PMID: 2684920 [PubMed - indexed for MEDLINE]

### **State of the science of music interventions. Critical care and perioperative practice.**

**White JM.** School of Nursing, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin, USA.

[jill@uwm.edu](mailto:jill@uwm.edu) Crit Care Nurs Clin North Am. 2000 Jun;12(2):219-25.

Music therapy is an easy to administer, relatively inexpensive, noninvasive intervention that can reduce anxiety and pain in critical care and perioperative patients. Libraries of relaxing music selections need to be compiled, reflecting diverse musical tastes. Providing patients with the opportunity to partake in music therapy sessions, selecting their own music, and providing them with quiet, uninterrupted time to listen to the music provides patients with a sense of control and separation from the multiple environmental stressors they are experiencing. Although there is now an extensive empirical base for the therapeutic usefulness of music therapy, particularly with the myocardial infarction population, few hospitals have adopted music therapy programs. Patient satisfaction and outcomes clearly have improved after music therapy sessions have been implemented. Further study with more diverse samples with a wider variety of medical conditions is indicated. Most of these studies used only one or two music sessions. It is not known whether effectiveness of music therapy sessions improves with repeated exposures. Further, there are little data with respect to optimal time for implementation of music therapy, length of music therapy sessions, or types of music to use. The effects of cultural diversity have not been addressed. Music therapy can improve the quality of care that

critical care and perioperative nurses deliver to their patients.

PMID: 11249367 [PubMed - indexed for MEDLINE]

### **Music therapy's relevance in a cancer hospital researched through a constructivist lens.**

O'Callaghan C, McDermott F. Peter MacCallum Cancer Centre, Melbourne, Australia.

J Music Ther. 2004 Summer;41(2):151-85

The constructivist research paradigm informed a research investigation on the relevance of music therapy in a cancer hospital, that is, what did the music therapy do and did it help? Over 3 months, criterion sampling was used to elicit interpretations in 5 studies from 5 sources: 128 patients who participated, 27 patients who overheard or witnessed music therapy, 41 visitors, 61 staff, and the music therapist-researcher. Fifty-seven percent of the patients who participated had advanced or end stage cancer. The music therapist's interpretations were recorded in a reflexive clinical journal and the respondents' interpretations were written on anonymous open-ended questionnaires. Thematic and content analyses were performed on the 5 groups of data with the support of qualitative data management software. Findings from the 5 data groups were contrasted and compared. Many patients', visitors' and staff members' affective, contemplative, and imagined moments in music therapy affirmed their "aliveness," resonating with an expanded consciousness, in a context where life's vulnerability is constantly apparent. Philosophical depictions about the relevance of music in human life, including theories by Addis and Winnicott, substantiated the therapeutic reactions.

PMID: 15307812 [PubMed - indexed for MEDLINE]

### **Music Improves Adherence to Exercise for COPD Patients**

Bauldoff GS, Hoffman LA, Zullo TG, Sciarba FC. Exercise maintenance following pulmonary rehabilitation: effect of distractive stimuli. *Chest*. 2002;122:948-954.

Completion of a pulmonary rehabilitation program (PRP) involving exercise training increases strength, endurance, and exercise tolerance while reducing dyspnea for elderly patients with chronic obstructive pulmonary disease (COPD). However, benefits gained from the PRP often drop off quickly after completion due to a lack of continued adherence. Researchers tested a home-based exercise regimen that included the use of music as a distractive stimuli with 24 elderly COPD patients who had recently completed a PRP. The subjects, mostly white females with an average age of 68 years, completed baseline surveys on depressive symptoms, anxiety, quality of life, and perceived dyspnea. Exercise tolerance was measured by 6-minute walk (6MW) distance. Each subject received instruction in a self-directed, 8-week walking program involving 20-45 minute sessions, 2 to 5 days a week, on flat terrain or on a treadmill, and each was given an electronic pedometer along with an exercise log to record the walking sessions. Subjects in the intervention group also received a portable audiocassette player with tapes of different types of music. At the end of the 8-week program, subjects in the intervention group had an average cumulative walking distance 24% greater than the control group. In addition, they showed a significant increase their 6MW distance and decrease in their dyspnea, while those in the control group remained at baseline or worsened. Depression in both groups decreased over time. Use of music as a distractive stimulus may decrease discomfort and improve adherence to exercise programs in COPD patients.

### **The effect of standard care, ibuprofen, and music on pain relief and patient satisfaction in adults with musculoskeletal trauma.**

J Emerg Nurs 2001 Apr;27(2):124-31 (ISSN: 0099-1767) Tanabe P; Thomas R; Paice J; Spiller M; Marcantonio R Northwestern Memorial Hospital, Chicago, IL 60607, USA. [ptanabe@nmh.org](mailto:ptanabe@nmh.org).

OBJECTIVE: The purposes of this study were to determine the most effective nursing intervention to decrease pain for patients with minor musculoskeletal trauma and moderate pain at triage and to examine patient satisfaction. METHODS: Patients were assigned to 1 of 3 intervention groups: (1) standard care (ice, elevation, and immobilization); (2) standard care and ibuprofen; or (3) standard care and music distraction. Patients were monitored for pain ratings for 60 minutes. Patients who sustained minor musculoskeletal trauma within the past 24 hours and presented with pain ratings of 4 or greater were included. Two patient satisfaction questions were asked upon discharge from the emergency department. RESULTS: Seventy-seven patients met the inclusion criteria. No differences in pain ratings between groups were demonstrated. A statistically significant reduction in pain for all patients occurred at 30 minutes ( $F = 16.18, P < .01$ ) and was maintained at 60 minutes. However, 70% of patients continued to report pain ratings of 4 or greater (on a scale of 1 to 10) at 60 minutes. The reduction in pain was not found to be clinically significant. Eighty-four percent of patients stated that they were more satisfied with their overall care in the emergency department

because of the immediate attention to pain relief they received at triage. No differences in satisfaction existed between treatment groups, although patients who reported higher pain ratings expressed statistically significant lower satisfaction with pain management scores ( $F = 9.375, P = .003$ ). **CONCLUSION:** None of the therapies-standard care (ice, elevation, immobilization), standard care with ibuprofen, or standard care with music distraction-provided clinically significant pain relief to patients who had minor musculoskeletal trauma (ie, sprains and fractures) and moderate pain at triage. Interestingly, satisfaction scores were sometimes positive, even when pain was not relieved.

### **The effects of harp music in vascular and thoracic surgical patients.**

Altern Ther Health Med 2002 Sep-Oct;8(5):52-4, 56-60 (ISSN: 1078-6791) Aragon D; Farris C; Byers JF Department of Vascular and Thoracic Surgery and Critical Care, Orlando Regional Healthcare System, University of Central Florida-Orlando, USA. **CONTEXT:** Music has been used in the acute clinical care setting as an adjunct to current treatment modalities. Previous studies have indicated that some types of music may benefit patients by reducing pain and anxiety, and may have an effect on physiological measures. **OBJECTIVE:** To evaluate the scientific foundation for the implementation of a complementary therapy, harp playing. The research questions for this pilot study were: Does live harp playing have an effect on patient perception of anxiety, pain, and satisfaction? Does live harp playing produce statistically and clinically significant differences in physiological measures of heart rate, systolic and diastolic blood pressure, respiratory rate, and oxygen saturation? **DESIGN:** A prospective, quasiexperimental, repeated measures design was used with a convenience sampling. **SETTING:** Orlando Regional Medical Center, Orlando Fla. **PATIENTS:** Subjects were eligible for the study if they were postoperative and admitted to a hard-wired bedside-monitored room of the Vascular Thoracic Unit within the 3 days of the study period. **INTERVENTION:** A single 20-minute live harp playing session. **MAIN OUTCOME MEASURES:** Visual analog scales (VAS) were used to measure patient anxiety and pain. Patient satisfaction was measured with a 4-item questionnaire. Physiological measures (heart rate, systolic and diastolic blood pressure, respiratory rate, and oxygen saturation) were recorded from the bedside monitor. **METHODS:** Visual analog scales (VAS) were completed just before harp playing, 20 minutes after harp playing was started, and 10 minutes after completion. Patient satisfaction with the experience was measured with a 4-item questionnaire. Physiological measures (heart rate, systolic and diastolic blood pressure, respiratory rate, and oxygen saturation) were recorded from the bedside monitor at baseline (5 minutes before study setup), at zero, 5, 10, 15, and 20 minutes after harp playing began, and at 5 and 10 minutes after harp playing stopped. **RESULTS:** Seventeen patients were used in this study, with a retrospective power of .91. Results indicate that listening to live harp music has a positive effect on patient perception of anxiety ( $P = .000$ ), pain ( $P = .000$ ) and satisfaction. Live harp playing also produced statistically significant differences in physiological measures of systolic blood pressure ( $P = .046$ ), and oxygen saturation ( $P = .011$ ). Although all values over time trended downward, the changes of other variables were not adequate to achieve statistical or clinical significance. **CONCLUSION:** Subjects in this study experienced decreased pain and anxiety with the harp intervention, and slight reductions in physiologic variable values. It is not possible in this study to determine if the results were due to the harp music, the presence of the harpist and data collector, or both. Future research is recommended using a control group and comparison of live versus recorded harp music with a wider variety of diagnoses and procedures.

### **Relaxation and music reduce pain after gynecologic surgery**

Good M, Anderson GC, Stanton-Hick M, Grass JA, Makii M.

*Pain Management Nursing.* 2002;3:61-70.

After gynecologic surgery, women tend to have pain that is incompletely relieved by patient-controlled anesthesia (PCA). Nonpharmacologic techniques of relaxation and listening to music have been shown to help decrease or relieve postsurgical pain among patients following a variety of procedures. Researchers tested pain relief interventions for 311 women, with an average age of 45 years, following gynecologic surgery. The subjects were divided into 3 intervention groups: jaw relaxation, soothing music, and a combination of relaxation and music. All patients were encouraged to ambulate after their procedure and taught to splint against their incision to decrease pain with movement. Pain intensity was measured by a Visual Analog Scale and the subjects were also asked to rate how well they slept on the first night after surgery. All patients in the intervention groups showed significantly reduced pain compared with the control group, who received standard care. Intervention patients with a PCA used 9% to 29% less pain medication than patients with a PCA alone. Reduced pain was related to an increase in ambulation and a decrease in

heart and respiratory rates. The interventions had no effect on first-night sleep. Nurses working with gynecologic surgery patients can offer relaxation techniques or music to help manage postoperative pain.

**A non-pharmacological approach to angina.**

AUTHORS: Orwin R

AUTHOR AFFILIATION: Freeman Hospital, Newcastle-upon-Tyne.

SOURCE: Prof Nurse 1998 Jun;13(9):583-6

CITATION IDS: PMID: 9782974 UI: 98456303

ABSTRACT: Chronic angina is a debilitating condition that can severely limit physical activity and lead to depression. Patients whose angina is not susceptible to acute surgical or pharmacological interventions may be offered no further palliative solutions. Non-pharmacological interventions such as TENS, spinal cord stimulation, music therapy, relaxation and humour warrant further research and consideration as adjuvant therapies.

**Effectiveness of a music therapy intervention on relaxation and anxiety for patients receiving ventilatory Heart Lung**

1998 May-Jun;27(3):169-76, Chlan L

ABSTRACT: OBJECTIVE: To test the effects of music therapy on relaxation and anxiety reduction for patients receiving ventilatory assistance. DESIGN: Two-group, pretest-posttest experimental design with repeated measures. Subjects randomized to either a 30-minute music condition or a rest period. SETTING: Four urban midwestern intensive care units. SUBJECTS: Fifty-four alert, nonsedated patients receiving mechanical ventilation. OUTCOME MEASURES: State anxiety (pretest and posttest), heart rate, and respiratory rate obtained every 5 minutes for 30 minutes. RESULTS: Subjects who received music therapy reported significantly less anxiety posttest (10.1) than those subjects in the control group (16.2). Heart rate and respiratory rate decreased over time for those subjects in the music group as compared with the control group subjects.

CONCLUSIONS: A single music therapy session was found to be effective for decreasing anxiety and promoting relaxation, as indicated by decreases in heart rate and respiratory rate over the intervention period with this sample of patients receiving ventilatory assistance.

**Effect of a music intervention on noise annoyance, heart rate, and blood pressure in cardiac surgery patients.**

Am J Crit Care 1997 May;6(3):183-91

ABSTRACT: Exposure to noise in a critical care unit may trigger a response by the sympathetic nervous system, thereby increasing cardiovascular work in patients recovering from cardiac surgery. OBJECTIVE: To investigate the

effects of a music intervention given twice on the first postoperative day on noise annoyance, heart rate, and arterial blood pressure in subjects with high (n = 22) and low (n = 18) sensitivity to noise. METHODS: A prospective, quasi-experimental, repeated-measures design was used. Based on results of power analysis, the sample size was 40. Subjects were recruited preoperatively, and their sensitivity to noise was assessed. On the first postoperative day, repeated-measures data were collected on levels of noise annoyance and physiological variables during 15 minutes of baseline and 15 minutes of music intervention on two occasions. Subjects completed a follow-up questionnaire regarding their perceptions of the noise in the critical care unit and the music intervention. RESULTS: Repeated-measures analysis of variance showed that subjects had lower levels of noise annoyance during music intervention than at baseline. Heart rate and systolic blood pressure decreased during the music intervention compared with baseline. Diastolic blood pressure decreased during the music intervention from baseline during time 2, but not time 1. Subjects with high baseline scores of noise sensitivity preoperatively had higher baseline levels of noise annoyance in the critical care unit the first postoperative day. Subjects rated the music intervention as highly enjoyable regardless of their baseline noise sensitivity or noise annoyance. CONCLUSION: Results of this study support the idea that noise annoyance is a highly individual phenomenon, influenced by a transaction of personal and environmental factors. Use of a music intervention with cardiac surgery patients during the first postoperative day decreased noise annoyance, heart rate, and systolic blood pressure regardless of the subject's noise sensitivity.

**Music therapy: a nursing intervention for the control of pain and anxiety in the ICU: a review of the research literature.**

AUTHORS: Henry LL

SOURCE: Dimens Crit Care Nurs 1995 Nov-Dec;14(6):295-304

CITATION IDS: PMID: 8631212 UI: 96232089

**ABSTRACT:**

Critical care patients experience both pain and anxiety related to their acute illness or injury and some painful treatments. Research on music therapy has shown that it can decrease pain and anxiety in critical care patients. This author suggests practice changes based on the body of research, which investigated the use of music.

**How would patients prefer to spend the waiting time before their operations?**

AUTHORS: Hyde R; Bryden F; Asbury AJ

AUTHOR AFFILIATION: Department of Anaesthetics, Healthcare International, Clydebank, UK.

SOURCE: Anaesthesia 1998 Feb;53(2):192-5 CITATION IDS: PMID: 9534647 UI: 98196146

**ABSTRACT:** Many surgical patients are anxious while waiting to go to the operating theatre in spite of the best preparation with drugs, information and reassurance. It is possible that patients could be more comfortable if allowed a choice of activities before operations. The objective of this study was to find out how pre-operative patients might prefer to occupy their time. We distributed 200 questionnaires to elective surgery patients and 184 (92%) were available for analysis. Of the respondents, 54.1% wanted to be slightly sleepy, 72.0% preferred not to be fast asleep and 57.2% preferred not to be wide awake. Reading (56.8%), listening to music (57.1%) and chatting with other patients (39.9%) were preferred activities. It might be appropriate to ask patients how sedated they would wish to be before their surgery and perhaps have alternatives to sedation available.

**The effect of music on the neurohormonal stress response to surgery under general anesthesia.**

Anesth Analg 2004 Feb;98(2):527-32, table of contents (ISSN: 0003-2999)

Migneault B; Girard F; Albert C; Chouinard P; Boudreault D; Provencher D; Todorov A; Ruel M; Girard DC  
Department of Anesthesiology, Centre Hospitalier de l'Universite de Montreal, Hopital Notre-Dame, Montreal, Canada.

Several pharmacological interventions reduce perioperative stress hormone release during surgery under general anesthesia. Listening to music and therapeutic suggestions were also studied, but mostly in awake patients, and these have a positive effect on postoperative recovery and the need for analgesia. In this study, we evaluated the effect of listening to music under general anesthesia on the neurohormonal response to surgical stress as measured by epinephrine, norepinephrine, cortisol, and adrenocorticotropic hormone (ACTH) blood levels. Thirty female patients scheduled for abdominal gynecological procedures were enrolled and randomly divided into two groups: group NM (no music) and group M (music). In group M, music was played from after the induction of anesthesia until the end of surgery. In the NM group, the patients wore the headphones but no music was played. We established three sample times for hormonal dosage during the procedure and one in the recovery room. Hemodynamic data were recorded at all times, and postoperative consumption of morphine in the first 24 h was noted. There was no group difference at any sample time or in the postoperative period in terms of mean arterial blood pressure, heart rate, isoflurane end-tidal concentration, time of the day at which the surgery was performed, bispectral index (BIS) value, doses of fentanyl, or consumption of postoperative morphine. There was no difference between the two groups with regard to plasma levels of norepinephrine, epinephrine, cortisol, or ACTH at any sample time, although the blood level of these hormones significantly increased in each group with surgical stimulation. In conclusion, we could not demonstrate a significant effect of intraoperative music on surgical stress when used under general anesthesia. **IMPLICATIONS:** Listening to music under general anesthesia did not reduce perioperative stress hormone release or opioid consumption in patients undergoing gynecological surgery.

**Healing the heart: integrating complementary therapies and healing practices into the care of cardiovascular patients.**

Prog Cardiovasc Nurs 2002 Spring;17(2):73-80 (ISSN: 0889-7204)

Kreitzer MJ; Snyder M

Center for Spirituality and Healing, University of Minnesota, MMC 505, 420 Delaware Street SE, Minneapolis, MN 55455, USA.

Complementary therapies and healing practices have been found to reduce stress, anxiety, and lifestyle patterns known to contribute to cardiovascular disease. Promising therapies include imagery and hypnosis, meditation, yoga, tai chi, prayer, music, exercise, diet, and use of dietary supplements. Many of these complementary approaches to healing have been within the domain of nursing for centuries and can readily be integrated into the care of patients with cardiovascular disease. While individual complimentary modalities hold considerable merit, it is critical that the philosophy underlying these therapies--caring, holism, and harmony--also be understood and honored. [(c) 2002 CHF, Inc.].

**Music listening as a nursing intervention: a symphony of practice.**

Holist Nurs Pract 2002 Apr;16(3):70-7 (ISSN: 0887-9311)

McCaffrey R; Locsin RC

Christine E. Lynn College of Nursing, Florida Atlantic University, Boca Raton, Florida, USA.

This article presents the use of music listening as an effective, noninvasive intervention designed to assist nurses in creating a healing environment to promote health and well-being. Music has demonstrated effectiveness in reducing pain, decreasing anxiety, and increasing relaxation. In addition, music has been used as a process to distract persons from unpleasant sensations and empower them with the ability to heal from within. As nurses develop practice patterns that are evidence based, the use of music listening could become an integral nursing intervention. To develop a guide for using music listening as a nursing intervention, six principles of practice are identified: intent, authentic presence, wholeness, preference, entrainment, and situating the client

**Minimizing preoperative anxiety with alternative caring-healing therapies.**

AORN J 2000 Nov;72(5):838-40, 842-3 (ISSN: 0001-2092)

Norred CL

School of Medicine, University of Colorado Health Sciences Center Department of Anesthesiology, Denver, USA.

This article reviews holistic caring-healing therapies that may decrease preoperative anxiety for the surgical patient, based on the philosophy and science of caring developed by Jean Watson, RN, PhD, FAAN. Dr Watson reveals a new paradigm emerging in health care that blends the compassion and caring of nursing in harmony with the curative therapies of medicine. Hypnosis, aromatherapy, music, guided imagery, and massage are integrative caring-healing therapies that may minimize preoperative anxiety. Alternative therapies offer a high-touch balance when integrated with high-tech conventional surgical treatments.

**3. Gerontological:**

**The meaning of music in the lives of older people: a qualitative study**

Terrence Hays, University Of New England **Victor** Minichiello, University Of New England

Psychology of Music, Vol. 33, No. 4, 437-451 (2005)

DOI: 10.1177/0305735605056160

This qualitative study describes the experience of music and focuses on the emotional, social, intellectual and spiritual well-being roles that music plays in the lives of older people. In-depth interviews were used to explore the meaning, importance and function of music for 52 older Australians living in the community aged 60 years and older. The findings revealed that music provides people with ways of understanding and developing their self-identity; connecting with others; maintaining well-being; and experiencing and expressing spirituality. The results show how music contributes to positive ageing by providing ways for people to maintain positive self-esteem, feel competent, independent, and avoid feelings of isolation or loneliness. The study highlights the need to be better informed about how music can facilitate and sustain older people's well-being.

**The therapeutic use of music in a care of the elderly setting: a literature review.**

**Kneafsey R.** Department of Nursing Studies, University of Edinburgh.

J Clin Nurs. 1997 Sep;6(5):341-6.

This paper reviews recent literature concerning the use of music and music therapy in health care. Focusing particularly on the elderly, the use of music in relation to patients with dementia and Parkinsonism is examined. Brief reference is also made to the use of music in pain control. Although in this case, literature is not specific to care of the elderly settings, the results are still relevant to gerontological nursing. Projects

which achieved positive results in controlling pain perception could be transferable to a care of the elderly scenario, where chronic pain is often part of daily life.

PMID: 9355467 [PubMed - indexed for MEDLINE]

#### **A trio to treasure: the elderly, the nurse, and music.**

Geriatr Nurs 2001 Jul-Aug;22(4):191-5; quiz 196-7 (ISSN: 0197-4572) Kramer MK

University of Utah, College of Nursing, Salt Lake City, USA. Music is a powerful tool for maintaining and restoring health and is particularly suited to elder care. Music can be used to induce relaxation, alter moods, and create distraction. Music's effect is attributed to its vibrational properties, which are processed through the senses and integrated within the central nervous system. Nurses have a major responsibility to understand, appreciate, and use music in their practice.

#### **Music therapy increases serum melatonin levels in patients with Alzheimer's disease.**

Altern Ther Health Med 1999 Nov;5(6):49-57, Kumar AM; Tims F; Cruess DG; Mintzer MJ; Ironson G; Loewenstein D; Cattan R; Fernandez JB; Eisdorfer C; Kumar M

ABSTRACT: CONTEXT: Music therapy is known to have healing and relaxing effects. Although these effects appear to be mediated by release of neurotransmitters and neurohormones, the specific neurohormonal systems

involved have not been fully investigated. OBJECTIVE: To assess the effects of a music therapy intervention on concentrations of melatonin, norepinephrine, epinephrine, serotonin, and prolactin in the blood of a group of patients with Alzheimer's disease. DESIGN: Blood samples were obtained before initiating the therapy, immediately at the end of 4 weeks of music therapy sessions, and at 6 weeks follow-up after cessation of the sessions. SETTING: Miami Veterans Administration Medical Center, Miami, Fla. PATIENTS: 20 male inpatients with Alzheimer's disease. INTERVENTION: 30- to 40-minute morning sessions of music therapy 5 times per week for 4 weeks. MAIN OUTCOME MEASURES: Changes in melatonin, norepinephrine, epinephrine, serotonin, and prolactin following music therapy. RESULTS: Melatonin concentration in serum increased significantly after music therapy and was found to increase further at 6 weeks follow-up. A significant increase was found between baseline values and data recorded after the music therapy sessions as well as at 6 weeks follow-up. Norepinephrine and epinephrine levels increased significantly after 4 weeks of music therapy, but returned to pretherapy levels at 6 weeks follow-up. Serum concentration of prolactin and platelet serotonin levels remained unchanged after 4 weeks of music therapy and at 6 weeks follow-up. CONCLUSION: Increased levels of melatonin following music therapy may have contributed to patients' relaxed and calm mood.

#### **Use of music to decrease aggressive behaviors in people with dementia.**

AUTHORS: Clark ME; Lipe AW; Bilbrey M

AUTHOR AFFILIATION: Tennessee Technological University, Cookeville, USA.

SOURCE: J Gerontol Nurs 1998 Jul;24(7):10-7

CITATION IDS: PMID: 9801526 UI: 99018334

ABSTRACT: The purpose of this study was to examine the effects of recorded, preferred music in decreasing occurrences of aggressive behavior among individuals with Alzheimer's type dementia during bathing episodes. Eighteen older adults, age 55 to 95, with severe levels of cognitive impairment, participated in the study. They were randomly scheduled for observation during bath time under either a control (no music) condition or an experimental condition in which recorded selections of preferred music were played via audiotape recorder during the bathing episode. Following a 2-week (10 episode) observation period, conditions were reversed. A total of 20 observations were recorded for each individual. Results indicated that during the music condition, decreases occurred in 12 of 15 identified aggressive behaviors. Decreases were significant ( $p < 0.05$ ) for the total number of observed behaviors and for hitting behaviors. During the music condition, caregivers frequently reported improved affect and a general increase in cooperation with the bathing task. The implications of these findings for improving the overall quality of care for severely cognitively impaired older adults are discussed.

#### **4. Childbirth/Babies:**

##### **the value of live music performed for stable, preterm babies in neonatal intensive care**

Shmuel Arnon, MD and colleagues at Meir Medical Center, Tel Aviv, Israel, (*Birth 33:2, June 2006*).

Musicians Eliana Gilad, and harpist Sunita Staneslow provided vocal and harp music as a duet throughout the study.

Thirty-one stable infants randomly received live music, recorded music, and no music therapy for thirty minutes on three consecutive days. The infants heart rate, respiratory rate, oxygen saturation, and a behavioral assessment were recorded, every 5 minutes, before, during, and after therapy, allowing 30 minutes for each interval. Also the infants state was assessed with a numerical scale: . 1, deep sleep; 2, light sleep; 3, drowsy; 4, quiet awake or alert; 5, actively awake and aroused; 6, highly aroused, upset, or crying; and 7, prolonged respiratory pause > 8 seconds. Parents and medical personnel completed a brief questionnaire indicating the effect of the three therapies music and no music therapies had no significant effect on any of the tested parameters during any time intervals. Further both medical personnel and parents preferred live music therapy, and parents considered live music therapy significantly more effective than the other therapies.

In a commentary about this research, Bryan C. Hunter, PhD, CAT, MT-BC, and Olle Jane Z. Saltier, MD (*Birth* 33:2 June 2006, p. 137), point out that “Arnon and colleagues appear to be the first to compare live versus recorded music in a single experimental design testing music therapy in the neonatal intensive care unit.” They also note that “the soothing effect of live music on the total environment should not be underestimated. It is much easier to become habituated to recorded music than to live music, where the therapist is present on-site, and interacting with patients, parents, and staff, and responding to the needs of individuals in real time. The potential carryover benefit of live music therapy for family and staff was also noted by Stewart and Schneider (1), and, in particular, live singing contains nurturing qualities that sound more caring and are distinguishable from recorded music, as noted by Courtnage (2).

Stewart K, Schneider S. The effects of music therapy on sound environment in the NICU: A pilot study.

In:Loewy JV, ed. Music Therapy in the Neonatal Intensive Care Unit. New York: Beth Israel Medical Center, 2000: 85-99.

Courtnage A. Providing rationale for the use of infant directed singing. In: Loewy JV, ed. Music Therapy in the Neonatal Intensive Care Unit. New York: Beth Israel Medical Center, 2000:71- 79.

### **A meta-analysis of the efficacy of music therapy for premature infants**

J Pediatr Nurs 2002 Apr;17(2):107-13 (ISSN: 0882-5963)

Standley JM Center for Music Research, Florida State University, Tallahassee, FL 32306-1180, USA.

This meta-analysis on music research with premature infants in neonatal intensive care units (NICU) showed an overall large, significant, consistent effect size of almost a standard deviation ( $d = .83$ ) (Cohen, 1998).

Effects were not mediated by infants' gestational age at the time of study, birthweight, or type of music delivery nor by physiologic, behavioral, or developmental measures of benefit. The homogeneity of findings suggests that music has statistically significant and clinically important benefits for premature infants in the NICU. The unique acoustic properties that differentiate music from all other sounds are discussed and clinical implications for research-based music therapy procedures cited. [Copyright 2002, Elsevier Science (USA). All rights reserved.].

### **Bedside musical care: applications in pregnancy, childbirth, and neonatal care.**

AUTHORS: Olson SL

AUTHOR AFFILIATION: Michigan State University, USA.

SOURCE: J Obstet Gynecol Neonatal Nurs 1998 Sep-Oct;27(5):569-75

CITATION IDS: PMID: 9773369 UI: 98446546

ABSTRACT: Although music therapy in health care settings is not new, bringing live music to the bedside is a new way of extending the caring tradition of nursing practice. Bedside musical care is consistent with a philosophy of holistic nursing practice and can be used during pregnancy, childbirth, and in neonatal care. It is defined as live music at the bedside, which is part of a treatment plan to foster integrity, well-being, and health for varied populations across the life span.

### **Therapeutic effects of music and mother's voice on premature infants.**

AUTHORS: Standley JM; Moore RS

SOURCE: Pediatr Nurs 1995 Nov-Dec;21(6):509-12, 574

CITATION IDS: PMID: 8700604 UI: 96334589

ABSTRACT: Aversive environment auditory stimuli is a common concern in neonatal intensive care.

Recently, interest has developed regarding the use of music applications to mask such stimuli and to reduce

the high risk for complications or failure to thrive. In this study of 20 oxygenated, low birth weight infants in a Newborn Intensive Care Unit of a regional medical center in the Southeastern United States, 10 infants listened to lullabies and 10 infants to recordings of their mother's voice through earphones for 20 minutes across three consecutive days. Oxygen saturation levels and frequency of oximeter alarms were recorded. Results indicated a differential response to the two auditory stimuli as listening time progressed. On Day 1, the infants listening to music had significantly higher oxygen saturation levels, but these effects disappeared by Days 2 and 3. On Days 2 and 3, however, the babies hearing music had significantly depressed oxygen saturation levels during the posttest intervals after the music was terminated. Infants hearing music had significantly fewer occurrences of Oximeter alarms during auditory stimuli than did those listening to the mothers' voice. Implications for the therapeutic use of auditory stimuli in the Newborn Intensive Care Unit are discussed.

**The effect of music and multimodal stimulation on responses of premature infants in neonatal intensive care.**

AUTHORS: Standley JM

AUTHOR AFFILIATION: Center for Music Research, Florida State University, Tallahassee, USA.

SOURCE: *Pediatr Nurs* 1998 Nov-Dec;24(6):532-8

CITATION IDS: PMID: 10085995 UI: 99185914

ABSTRACT: To assess the benefits of lullaby singing and multimodal stimulation on premature infants in neonatal intensive care, 40 infants in a Level III Newborn Intermediate Care Unit were divided into control (n = 20) and experimental (n = 20) groups by pair matching on the basis of gender, birthweight, gestational age at birth and severity of medical complications. Participants met these project criteria: (a) corrected gestational age > 32 weeks; (b) age since birth > 10 days; and (c) weight > 1700 g. All participants had been referred for developmental stimulation by the medical staff. Experimental infants received reciprocal, multimodal (ATVV) stimulation paired with line singing of Brahms' Lullaby. Stimulation was provided for 15-30 minutes, one or two times per week from referral to discharge. Dependent variables were (a) days to discharge, (b) weight gain/day, and (c) experimental infants' tolerance for stimulation. Results showed that music and multimodal stimulation significantly benefited females' days to discharge and increased weight gain/day for both males and females. Both male and female infants' tolerance for stimulation showed marked and steady increase across the stimulation intervals with females' tolerance increasing more rapidly than males.

**The effect of soothing music on neonatal behavioral states in the hospital newborn nursery.**

AUTHORS: Kaminski J; Hall W

SOURCE: *Neonatal Netw* 1996 Feb;15(1):45-54

CITATION IDS: PMID: 8700082 UI: 96333557

ABSTRACT:

Most newborns born in Western countries spend their first transitional hours in hospital nurseries. Noxious noise levels in the nursery can interfere with neonatal efforts to achieve physiological and behavioral homeostasis. Literature indicates that music has been used to induce relaxation states and reduce stress responses. This study used a one- group, pretest, posttest design. A convenience sample of 20 term, Caucasian neonates was recruited. The number of high arousal behavioral states and the number of state changes of the newborns was recorded for a control and an experimental period. Soothing, lyrical music was played in the baby's bed during the experimental period. The data was compared using McNemar's test statistic. A significant difference ( $p < .01$ ) was observed. The results suggest that soothing music may be a feasible intervention to help newborns demonstrate fewer high arousal states and less state lability.

**Effects of music therapy on oxygen saturation in premature infants receiving endotracheal suctioning.**

*J Nurs Res (China)* 2003 Sep;11(3):209-16 (ISSN: 1682-3141)

Chou LL; Wang RH; Chen SJ; Pai L

Tri-Service General Hospital.

The purpose of this study was to investigate how premature infants' oxygen saturation changed in response to music therapy while they were receiving endotracheal suctioning. A convenience sample of 30 premature infants was selected from three neonatal intensive care units. A one-group repeated measures design was adopted for this study. The oxygen saturation of all subjects was first measured while they were receiving endotracheal suctioning during a four-hour control period with regular care. Then, four hours after the

control period was completed, an experimental period began in which the music " Transitions " was played. One minute before suctioning, the level of oxygen saturation was measured to provide the baseline data. During a period of 30 minutes after suctioning, the oxygen saturation was recorded every minute to analyze the clinical effects of music therapy. The results showed that premature infants receiving music therapy with endotracheal suctioning had a significantly higher SPO<sub>2</sub>; than that when not receiving music therapy ( $p < .01$ ), and the level of oxygen saturation returned to the baseline level faster than when they did not receive music therapy ( $p < .01$ ). Accordingly, it is hoped that giving appropriate music therapy as developmental care to premature infants when performing any nursing intervention may enhance not only the quality of nursing care but also quality of the infant's life.

#### **Music therapy following suctioning: four case studies.**

AUTHORS: Burke M; Walsh J; Oehler J; Gingras J

SOURCE: Neonatal Netw 1995 Oct;14(7):41-9

CITATION IDS: PMID: 7565526 UI: 96027281

ABSTRACT: This descriptive study evaluates and compares the effectiveness of music, presented both aurally and vibrotactilely, in reducing agitation and physiological instability following a stress-producing intervention (suctioning) in infants with bronchopulmonary dysplasia. Heart rate, oxygen saturation levels, level of arousal, stressful facial expressions, and autonomic indicators were recorded for each of four preterm infants. All infants experienced a reduction in the level of arousal during the taped music intervention when compared with the control condition. Three infants spent an increased amount of time in a quiet alert state and had improved oxygen saturation levels during the vibrotactile intervention. All infants spent more time sleeping during the taped music condition than without music or with the vibrotactile intervention. Results suggest that music is effective in reducing stress-related behaviors for some infants.

## **5. Other**

#### **The connection between rhythmicity and brain function.**

UTHORS: Thaut MH; Kenyon GP; Schauer ML; McIntosh GC

AUTHOR AFFILIATION: Dept. of Music, Theater, Dance, Colorado State University, Ft. Collins, USA.

SOURCE: IEEE Eng Med Biol Mag 1999 Mar-Apr;18(2):101-8

CITATION IDS: PMID: 10101675 UI: 99201891

ABSTRACT: Although rhythm and music are not entirely synonymous terms, rhythm constitutes one of the most essential structural and organizational elements of music. When considering the effect of music on human adaptation, the profound effect of rhythm on the motor system strongly suggests that the time structure of music is the essential element relating music specifically to motor behavior. Why the motor system appears so sensitive to auditory priming and timing stimulation can only be partially answered so far. The high-performance function of the auditory system regarding processing of time information makes good functional sense within the constraints of auditory sensory processing. Thus, the motor system sensitivity to auditory entrainment may simply be an evolutionary useful function of taking advantage of the specific and unique aspects of auditory information processing for enhanced control and organization of motor behavior; e.g., in the time domain. Unlike processes in the motor system, many other physiological processes cannot be effectively entrained by external sensory stimuli. For example, there is probably a very good protective reason why other cyclical physiological processes (e.g., autonomic processes such as heart rate) have only very limited entrainment capacity to external rhythmic cues. Some of the basic auditory-motor arousal connections may also have their basis in adaptive evolutionary processes related to survival behavior; e.g., in fight or flight reactions. Much of the "why" in auditory-motor interactions, however, remains unknown heuristically. In the absence of this knowledge, great care should be taken to not compensate for this lack of understanding of specific cause and effect processes by assigning anthropomorphic descriptions to the behavior of biological and physical systems. The unraveling of the perceptual, physiological, and neuroanatomical basis of the interaction between rhythm and movement has been, and continues to be, a fascinating endeavor with important ramifications for the study of brain function, sensory perception, and motor behavior. One of the most exciting findings in this research, however, may be the evidence that the interaction between auditory rhythm and physical response can be effectively harnessed for specific therapeutic purposes in the rehabilitation of persons with movement disorders.

### **Effects of relaxing music on salivary cortisol level after psychological stress.**

Ann N Y Acad Sci 2003 Nov;999:374-6 (ISSN: 0077-8923)

Khalfa S; Bella SD; Roy M; Peretz I; Lupien SJ

INSERM EMI-U 9926, Universite de la Mediterranee, Faculte de Medecine Timone, 13385 Marseille cedex 05, France. [skhalfa@skhalfa.com](mailto:skhalfa@skhalfa.com).

The goal of the present study was to determine whether relaxing music (as compared to silence) might facilitate recovery from a psychologically stressful task. To this aim, changes in salivary cortisol levels were regularly monitored in 24 students before and after the Trier Social Stress Test. The data show that in the presence of music, the salivary cortisol level ceased to increase after the stressor, whereas in silence it continued to increase for 30 minutes.

Results obtained from projects in which self-organizing musical structures spontaneously arise through electrical interface between the brain and generative musical systems are surveyed. This provides a springboard for examining important paradigm shifts taking place in our thinking about what musical forms can be and how this might influence efforts to increase our understanding of the underlying neural dynamics. Implications of this work for the design of music curricula are considered, emphasizing the importance of active imaginative listening. A view of composing, termed "propositional music," is introduced in which the proposition of cognitive models of music is an ongoing part of creative musical activity.

### **Ira Maximilian Altshuler: psychiatrist and pioneer music therapist.**

J Music Ther 2003 Fall;40(3):247-63 (ISSN: 0022-2917)

Davis WB

Colorado State University, USA.

The purpose of this study was to examine the life of Ira Maximilian Altshuler, psychiatrist and pioneer music therapist. In 1938, Dr. Altshuler initiated one of the first large-scale music therapy programs for mentally ill persons in the country at Detroit's Eloise Hospital. His innovative programs combined psychoanalytic techniques and music therapy methods specifically designed for use with large groups of clients. He later trained some of the first music therapy interns in the country, including Carol Collins, who served for many years as Professor of Music Therapy at Wayne State University, and Esther Goetz Gilliland, who later became President of NAMT. Dr. Altshuler promoted the practice and profession tirelessly, speaking to numerous audiences over the years and writing 19 articles about music therapy. Altshuler participated in the National Association for Music Therapy (NAMT) organizational meeting held in New York City in 1950. An active member of the organization for many years, he served on the Research Committee and hosted the 1955 national NAMT conference in Detroit. Even after Altshuler's retirement from Eloise Hospital in 1963, he remained active in numerous civic, music, and music therapy activities until his death 5 year later. Ira Altshuler should be remembered along with other music therapists from the time-Willem Van de Wall, Harriet Ayer Seymour and others-who vigorously embraced and advanced the status of the profession.

### **Examples of the use of music in clinical medicine] [Eksempler på bruk av musikk i klinisk medisin.]**

**Tidsskr Nor Laegeforen 2000 Apr 10;120(10):1186-90**

(ISSN: 0029-2001) Myskja A; Lindbaek M

Seksjon for allmennmedisin, Universitetet i Oslo. Music has been an element in medical practice throughout history. There is growing interest in music as a therapeutic tool. Since there is no generally accepted standard for how, when and where music should be applied within a medical framework, this literature study endeavours to present an overview of central areas of application of music in medicine. It further attempts to find tentative conclusions that may be drawn from existing clinical research on the efficacy of music as a medical tool. Traditionally, music has been linked to the treatment of mental illness, and has been used successfully to treat anxiety and depression and improve function in schizophrenia and autism. In clinical medicine several studies have shown analgetic and anxiolytic properties that have been used in intensive care units, both in diagnostic procedures like gastroscopy and in larger operations, in preoperative as well as postoperative phases, reducing the need for medication in several studies. The combination of music with guided imagery and deep relaxation has shown reduction of symptoms and increased well-being in chronic pain syndromes, whether from cancer or rheumatic origin. Music has been used as support in pregnancy and gestation, in internal medicine, oncology, paediatrics and other related fields. The use of music with geriatric patients could prove to be especially fruitful, both in its receptive and its active aspect. Studies have shown that music can improve function and alleviate symptoms in stroke rehabilitation, Parkinson's disease, Alzheimer's disease and other forms of dementia. The role of music in medicine is primarily supportive and

palliative. The supportive role of music has a natural field of application in palliative medicine and terminal care. Music is well tolerated, inexpensive, with good compliance and few side effects.

### **Dyslexia and music. From timing deficits to musical intervention.**

Ann N Y Acad Sci 2003 Nov;999:497-505 (ISSN: 0077-8923)

Overy K

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The underlying causes of the language and literacy difficulties experienced by dyslexic children are not yet fully understood, but current theories suggest that timing deficits may be a key factor. Dyslexic children have been found to exhibit timing difficulties in the domains of language, music, perception and cognition, as well as motor control. The author has previously suggested that group music lessons, based on singing and rhythm games, might provide a valuable multisensory support tool for dyslexic children by encouraging the development of important auditory and motor timing skills and subsequently language skills. In order to examine this hypothesis, a research program was designed that involved the development of group music lessons and musical tests for dyslexic children in addition to three experimental studies. It was found that classroom music lessons had a positive effect on both phonologic and spelling skills, but not reading skills. Results also indicated that dyslexic children showed difficulties with musical timing skills while showing no difficulties with pitch skills. These apparent disassociations between spelling and reading ability and musical timing and pitch ability are discussed. The results of the research program are placed in the context of a more general model of the potential relationship between musical training and improved language and literacy skills.

### **Synchronizing with music: intercultural differences.**

Ann N Y Acad Sci 2003 Nov;999:429-37 (ISSN: 0077-8923)

Drake C; Ben El Heni J

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The way in which listeners perceive music changes throughout childhood, but little is known about the factors responsible for these changes. One factor, explicit music training, has received considerable attention, with studies indicating that musicians demonstrate a more complex hierarchical mental representation for music and superior temporal organizational skills. But does acculturation-the passive exposure to a particular type of music since birth-also influence the acquisition of these skills? We compared the music synchronization performance of Tunisian and French subjects with music from these two contrasting musical cultures. Twelve musical excerpts were selected from the two popular music cultures, matched for perceived tempo, complexity, and familiarity, and subjects were asked to tap in time with the music. Tapping mode (rate and hierarchical level) varied with subjects' familiarity with the musical idiom, as evidenced by an interaction between musical culture and type of music: participants synchronized at higher hierarchical levels (and over a wider range) with music from their own culture than with an unfamiliar type of music. Thus, passive acculturation as well as explicit music tuition influence our perception and cognition of music.

### **Measuring effects of music, noise, and healing energy using a seed germination bioassay**

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**OBJECTIVE:** To measure biologic effects of music, noise, and healing energy without human preferences or placebo effects using seed germination as an objective biomarker. **METHODS:** A series of five experiments were performed utilizing okra and zucchini seeds germinated in acoustically shielded, thermally insulated, dark, humid growth chambers. Conditions compared were an untreated control, musical sound, pink noise, and healing energy. Healing energy was administered for 15-20 minutes every 12 hours with the intention that the treated seeds would germinate faster than the untreated seeds. The objective marker was the number of seeds sprouted out of groups of 25 seeds counted at 12-hour intervals over a 72-hour growing period. Temperature and relative humidity were monitored every 15 minutes inside the seed germination containers. A total of 14 trials were run testing a total of 4600 seeds. **RESULTS:** Musical sound had a highly statistically significant effect on the number of seeds sprouted compared to the untreated control over all five experiments for the main condition ( $p < 0.002$ ) and over time ( $p < 0.000002$ ). This effect was independent of

temperature, seed type, position in room, specific petri dish, and person doing the scoring. Musical sound had a significant effect compared to noise and an untreated control as a function of time ( $p < 0.03$ ) while there was no significant difference between seeds exposed to noise and an untreated control. Healing energy also had a significant effect compared to an untreated control (main condition,  $p < 0.0006$ ) and over time ( $p < 0.0001$ ) with a magnitude of effect comparable to that of musical sound. **CONCLUSION:** This study suggests that sound vibrations (music and noise) as well as biofields (bioelectromagnetic and healing intention) both directly affect living biologic systems, and that a seed germination bioassay has the sensitivity to enable detection of effects caused by various applied energetic conditions.

### **Healing of harmony: music therapy as a historical cultural phenomenon**

[Heilkraft der Harmonie: Musiktherapie als kulturhistorisches Phänomen.]

Schweiz Rundsch Med Prax 1999 May 20;88(21):956-64 (ISSN: 1013-2058)

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The interaction of music and psyche constitutes a phenomenon, which is known to man since antiquity, and, for this reason, was ever since used for healing purposes. The pythagoreans developed a system of musical theory that declared consonance to be a musical interval with the frequencies in a ratio of integer numbers. The cosmical music of the spheres, the played instrumental music and the inner music of man, these all they conceived as a unity. Varied in a manifold way, this great theme was handed down over the centuries to the present day, being a source of inspiration to music and the sciences. Modern musical therapy is, in the last analysis, based on these intuitive findings.

### **Music therapy and chiropractic: an integrative model of tonal and rhythmic spinal adjustment**

Altern Ther Health Med 1999 Mar;5(2):102-4 (ISSN: 1078-6791)

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There is a philosophical basis for the integration of treatment using music therapy and chiropractic. Perception is intimately linked to the nervous system. A relationship between spinal integrity and consciousness does exist. We can see that as spinal distortions diminish and awareness increases, there is a natural attraction toward the higher or more loving state of consciousness. Rhythms of healing and suffering are a key concept in combining music therapy with chiropractic manipulation. Donald Epstein's conceptualization of the rhythmic stages of consciousness corresponding to prescribed physiological patterns serves as a starting point for the use of rhythm in the healing process. Using interactive music, the music therapist can help facilitate a change in the patient's physical or emotional state. This occurs when the practitioner establishes an initial connection or musical validation of the patient's emotional state and assists the healing process by improvising supportive music while suggesting possibilities for resolution. We believe that the power of music can be used as a significant tool in chiropractic work to aid individuals in their healing process.

Caring. 1998 Sep;17(9):46-8.

### **Music therapy and home care.**

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As home care looks to alternative programs to serve the community and generate income, one service that is beginning to attract more attention is music therapy. As a means to relaxation and healing, this therapy can help patients heal from within and even strengthens the immune system.

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