

Neonatal & Pediatric Therapeutic Music Abstracts & Articles

Arnon, S, Shapsa, A, Forman, L, Regev, R H, Baur, S, Litmanovitz, I, Dolfin, T Z

Journal: *Birth*, Vol. 33 (2): 131-6, 2006

Abstract: **BACKGROUND: Music stimulation has been shown to provide significant benefits to preterm infants. We hypothesized that live music therapy was more beneficial than recorded music and might improve physiological and behavioral parameters of stable preterm infants in the neonatal intensive care unit.** **METHODS:** Thirty-one stable infants randomly received live music, recorded music, and no music therapy over 3 consecutive days. A control of the environment noise level was imposed. Each therapy was delivered for 30 minutes. Inclusion criteria were postconceptional age \geq 32 weeks, weight \geq 1,500 g, hearing confirmed by distortion product otoacoustic emissions (DPOAEs), and no active illness or documentation of hyperresponsiveness to the music. 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. The infant's state was given a numerical score as follows: 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. The volume range of both music therapies was from 55 to 70 dB. Parents and medical personnel completed a brief questionnaire indicating the effect of the three therapies. **RESULTS:** Live music therapy had no significant effect on physiological and behavioral parameters during the 30-minute therapy; however, at the 30-minute interval after the therapy ended, it significantly reduced heart rate (150 \pm 3.3 beats/min before therapy vs 127 \pm 6.5 beats/min after therapy) and improved the behavioral score (3.1 \pm 0.8 before therapy vs 1.3 \pm 0.6 after therapy, $p < 0.001$). Recorded music and no music therapies had no significant effect on any of the tested parameters during all intervals. Both medical personnel and parents preferred live music therapy to recorded music and no music therapies; however, parents considered live music therapy significantly more effective than the other therapies. **CONCLUSIONS:** Compared with recorded music or no music therapy, live music therapy is associated with a reduced heart rate and a deeper sleep at 30 minutes after therapy in stable preterm infants. Both recorded and no music therapies had no significant effect on the tested physiological and behavioral parameters.

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 SPO₂; 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.

Babies Remember Music Heard In The Womb

By John Griffiths 7-12-11

LONDON (Reuters Health) - Children recognise and prefer music they were exposed to in the womb for at least a year after they are born, according to the results of a small UK study.

Dr. Alexandra Lamont of the University of Leicester studied 14 mothers who played a particular piece of music--ranging from classical to reggae and pop--to their babies during the last 3 months of pregnancy.

At the age of 1 year, 11 of the babies were tested for their ability to recognize the music. "All babies showed a significant preference for the pieces of music they were exposed to in the womb over very similar tunes they had not heard previously," Lamont said in an interview with Reuters Health. According to Lamont, a foetus can fully hear sounds outside the womb beginning at about 20 weeks after conception. This study, she notes, demonstrates that babies can remember--and prefer--music they heard before they were born.

None of the babies were exposed to the prenatal tunes between birth and their first birthday. This, according to Lamont, means that preferences found in this study were based on long-term memory. "This is the first time that memory in babies has been shown to last more than 1 or 2 months," she said.

A separate group of 11 babies who had not been played the music in the womb were tested with the same pieces of music and showed no particular preferences. "Early shared experiences are a crucial part of childhood development," Lamont said. "When they recognized the music, some babies also turned around to their mothers, indicating that the music played some sort of role in developing an emotional bond." According to Lamont, babies did not show a preference for a particular musical style--recognizing reggae as often as they did Mozart.

Lamont plans to study how long a baby's memory of a piece of music lasts. She will also look at how musical taste develops and how it fits with family preferences and prenatal exposure. "All babies like fast, exciting music at the age of 12 months, but we may find that preferences for music they were played in the womb may return later in life," she added. Lamont emphasized that she found no evidence that playing music to babies, whether classical or pop, improved their intelligence.

According to Professor Peter Hepper, an expert on prenatal development at Queens University in Belfast, "These results are exciting as they suggest that the developing brain is capable of storing and recovering memories over a long period of time." In an interview with Reuters Health, Hepper said, "Obviously, there must be underlying changes in the brain to enable this recognition, but whether such early exposure leads to preferences for certain types of music in later life is presently unknown. Whether these babies will be more musical, given their early education is also unknown." He added, "At a more general level, the results indicate that environmental factors experienced by the foetus may have a long-term influence on its development. And they support the growing realisation that the prenatal period is more important than previously thought."

Music for Children with Autism and Other Developmental Disabilities: 2009 Abstracts, compiled by Beverly Seng, CMP

1. The effect of music on peer awareness in preschool age children with developmental disabilities. Sussman JE.

J Music Ther. 2009 Spring;46(1):53-68.

University of Missouri-Kansas City, USA.

The purpose of this study was to determine the effect of music on peer awareness in preschool age children with developmental disabilities. Specifically, this study sought to find which combinations of musical and play elements produced the longest durations of sustained attention towards peers and the highest frequency of alternating attention from peer to peer. Nine children between the ages of 2 and 6 who had been diagnosed with a developmental disability participated in the study. Each participant completed 4 small group sessions with the researcher and 2 other research participants. During each session, the children participated in activities targeting peer awareness that incorporated musical and play elements. Behavioral data were recorded representing the children's sustained and alternating attention towards peers. **Results**

indicated that children sustained attention towards peers for the longest durations and alternated attention from peer to peer at the highest frequencies during activities that utilized a musical object within a nonmusical or play-based context.

PMID: 19256732 [PubMed - indexed for MEDLINE]

2. Effects of developmental music groups for parents and premature or typical infants under two years on parental responsiveness and infant social development.

Walworth DD. J Music Ther. 2009 Spring;46(1):32-52.

The Florida State University, USA.

The purpose of this study was to examine the effect of music therapy intervention **on premature infants' and full term infants' developmental responses and parents' responsiveness.**

Subjects (n=56) were parent-infant dyads who attended developmental music groups or a control condition assessing responsiveness during toy play. All subjects were matched according to developmental age and were also matched by group for socioeconomic status and for maternal depression. Types of infant play and parent responsiveness were measured using observation of a standardized toy play for parent-infant dyads. Observations were coded with the number of seconds spent in each behavior using the SCRIBE observation program. Parents completed a questionnaire on the perception of their infant's general development, interpretations of their child's needs, the purpose of using music with their child, and their child's response to music.

The infants attending the developmental music groups with their parents demonstrated significantly more social toy play ($p < .05$) during the standardized parent-infant toy play than infants who did not attend the music groups. While not significant, graphic analysis of parent responsiveness showed parents who attended the developmental music groups engaged in more positive and less negative play behaviors with their infants than parents who did not attend the music groups. This study demonstrates the first findings of positive effects of developmental music groups on social behaviors for both premature and full term infants under 2 years old.

3. Emotional, motivational and interpersonal responsiveness of children with autism in improvisational music therapy.

Kim J, Wigram T, Gold C. Autism. 2009 Jul;13(4):389-409

Department of Arts Therapy, College of Alternative Medicine, Jeonju University, Korea.

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Through behavioural analysis, this study investigated the social-motivational aspects of musical interaction between the child and the therapist in improvisational music therapy by measuring emotional, motivational and interpersonal responsiveness in children with autism during joint engagement episodes. The randomized controlled study (n = 10) employed a single subject comparison design in two different conditions, improvisational music therapy and toy play sessions, and DVD analysis of sessions. **Improvisational music therapy produced markedly more and longer events of 'joy', 'emotional synchronicity' and 'initiation of engagement' behaviours** in the children than toy play sessions. In response to the therapist's interpersonal demands, 'compliant (positive) responses' were observed more in music therapy than in toy play sessions, and **'no responses' were twice as frequent in toy play sessions as in music therapy.** The results of this exploratory study found significant evidence supporting the **value of music therapy in promoting social, emotional and motivational development in children with autism.**

PMID: 19535468 [PubMed - indexed for MEDLINE]

4. The effect of background music and song texts on the emotional understanding of

children with autism. Katagiri J. *J Music Ther.* 2009 Spring;46(1):15-31.

The Florida State University, USA.

The purpose of this study was to examine the effect of background music and song texts to teach emotional understanding to children with autism. Participants were 12 students (mean age 11.5 years) with a primary diagnosis of autism who were attending schools in Japan. Each participant was taught four emotions to decode and encode: happiness, sadness, anger, and fear by the counterbalanced treatment-order. The treatment consisted of the four conditions: (a) no contact control (NCC)--no purposeful teaching of the selected emotion, (b) contact control (CC)--teaching the selected emotion using verbal instructions alone, (c) background music (BM)--teaching the selected emotion by verbal instructions with background music representing the emotion, and singing songs (SS)--teaching the selected emotion by singing specially composed songs about the emotion. Participants were given a pretest and a posttest and received 8 individual sessions between these tests. **The results indicated that all participants improved significantly in their understanding of the four selected emotions. Background music was significantly more effective than the other three conditions in improving participants' emotional understanding.** The findings suggest that background music can be an effective tool to increase emotional understanding in children with autism, which is crucial to their social interactions.

PMID: 19256729 [PubMed - indexed for MEDLINE]

5. The Effect of Music on Social Attribution in Adolescents with Autism Spectrum Disorders. Bhatara AK, Quintin EM, Heaton P, Fombonne E, Levitin DJ.

Child Neuropsychol. 2009 Jan 13:1-22. [Epub ahead of print]

McGill University, Montreal, Canada.

High-functioning adolescents with ASD and matched controls were presented with animations that depicted varying levels of social interaction and were either accompanied by music or silent. Participants described the events of the animation, and we scored responses for intentionality, appropriateness, and length of description. **Adolescents with ASD were less likely to make social attributions, especially for those animations with the most complex social interactions. When stimuli were accompanied by music, both groups were equally impaired in appropriateness and intentionality.** We conclude that adolescents with ASD perceive and integrate musical soundtracks with visual displays equivalent to typically developing individuals. PMID: 19140055 [PubMed - as supplied by publisher]

6. Novel and emerging treatments for autism spectrum disorders: a systematic review.

Rossignol DA. *Ann Clin Psychiatry.* 2009 Oct-Dec;21(4):213-36.

International Child Development Resource Center, Melbourne, FL 32934, USA.

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BACKGROUND: Currently, only one medication (risperidone) is FDA-approved for the treatment of autism spectrum disorders (ASD). Perhaps for this reason, the use of novel, unconventional, and off-label treatments for ASD is common, with up to 74% of children with ASD using these treatments; however, treating physicians are often unaware of this usage.

METHODS: A systematic literature search of electronic scientific databases was performed to identify studies of novel and emerging treatments for ASD, including nutritional supplements, diets, medications, and nonbiological treatments. A grade of recommendation ("Grade") was then assigned to each treatment using a validated evidence-based guideline as outlined in this review: **A: Supported by at least 2 prospective randomized controlled trials (RCTs) or 1 systematic review.** B: Supported by at least 1 prospective RCT or 2 nonrandomized controlled

trials. C: Supported by at least 1 nonrandomized controlled trial or 2 case series. D: Troublingly inconsistent or inconclusive studies or studies reporting no improvements. Potential adverse effects for each treatment were also reviewed. **RESULTS: Grade A treatments for ASD include melatonin, acetylcholinesterase inhibitors, naltrexone, and music therapy.** Grade B treatments include carnitine, tetrahydrobiopterin, vitamin C, alpha-2 adrenergic agonists, hyperbaric oxygen treatment, immunomodulation and anti-inflammatory treatments, oxytocin, and vision therapy. Grade C treatments for ASD include carnosine, multivitamin/mineral complex, piracetam, polyunsaturated fatty acids, vitamin B6/magnesium, elimination diets, chelation, cyproheptadine, famotidine, glutamate antagonists, acupuncture, auditory integration training, massage, and neurofeedback. **CONCLUSIONS:** The reviewed treatments for ASD are commonly used, and some are supported by prospective RCTs. Promising treatments include melatonin, antioxidants, acetylcholinesterase inhibitors, naltrexone, and music therapy. All of the reviewed treatments are currently considered off-label for ASD (ie, not FDA-approved) and some have adverse effects. Further studies exploring these treatments are needed. Physicians treating children with an ASD should make it standard practice to inquire about each child's possible use of these types of treatments.
PMID: 19917212 [PubMed - in process]

7. Exploring musical taste in severely autistic subjects: preliminary data.

Boso M, Comelli M, Vecchi T, Barale F, Politi P. Ann N Y Acad Sci. 2009 Jul;1169:332-5. Department of Applied Health and Behavioral Sciences, Section of Psychiatry, University of Pavia, Via Bassi 21, 27100 Pavia, Italy. m_boso@yahoo.it

As a consequence of frequent limbic alterations, autistic persons could judge pleasant and unpleasant music in an unusual manner. We explored this possibility by using consonant and dissonant music (test 2) and excluded the eventuality that they could prefer other auditory stimuli by comparing familiar music to environmental sounds (test 1). In both tests, severe autistics and controls were asked to listen under two conditions (familiar music versus environmental sounds; pleasant versus unpleasant music) in a counterbalanced order while the time spent during each condition was measured. Both groups significantly preferred the musical task and the pleasant music condition. No difference between groups was detected. Results demonstrate that severely autistic subjects share with healthy people the same musical preferences.

PMID: 19673802 [PubMed - indexed for MEDLINE]

8. "With concord of sweet sounds...": new perspectives on the diversity of musical experience in autism and other neurodevelopmental conditions.

Heaton P, Allen R.

Ann N Y Acad Sci. 2009 Jul;1169:318-25.

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Questions about music's evolution and functions have long excited interest among scholars. More recent theoretical accounts have stressed the importance of music's social origins and functions. Autism and Williams syndrome, neurodevelopmental disorders supposedly characterized by contrasting social and musical phenotypes, have been invoked as evidence for these. However, empirical data on social skills and deficits in autism and Williams syndrome do not support the notion of contrasting social phenotypes: research findings suggest that the **social deficits characteristic of both disorders may increase rather than reduce the importance of music.** Current data do not allow for a direct comparison of musical phenotypes in autism and Williams syndrome, although it is noted that deficits in music cognition have been observed in Williams syndrome, but not in autism. In considering broader questions about musical

understanding in neurodevelopmental disorders, we conclude that intellectual impairment is likely to result in qualitative differences between handicapped and typical listeners, but this **does not appear to limit the extent to which individuals can derive benefits from the experience of listening to music.**

PMID: 19673800 [PubMed - indexed for MEDLINE]

9. Rhythm reproduction in kindergarten, reading performance at second grade, and developmental dyslexia theories.

Dellatolas G, Watier L, Le Normand MT, Lubart T, Chevrie-Muller C.

Arch Clin Neuropsychol. 2009 Sep;24(6):555-63. Epub 2009 Jul 22.

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Temporal processing deficit could be associated with a specific difficulty in learning to read. **In 1951, Stambak provided preliminary evidence that children with dyslexia performed less well than good readers in reproduction of 21 rhythmic patterns.** Stambak's task was administered to 1,028 French children aged 5-6 years. The score distribution (from 0 to 21) was quasi-normal, with some children failing completely and other performing perfectly. In second grade, reading was assessed in 695 of these children. Kindergarten variables explained 26% of the variance of the reading score at second grade. **The Stambak score was strongly and linearly related to reading performance in second grade, after partialling out performance on other tasks (oral repetition, attention, and visuo-spatial tasks) and socio-cultural level.**

Findings are discussed in relation to perceptual, cerebellar, intermodal, and attention-related theories of developmental dyslexia. It is concluded that simple rhythm reproduction tasks in kindergarten are predictive of later reading performance.

PMID: 19628461 [PubMed - indexed for MEDLINE]

10. Motor timing and precursor literacy skills in very young children.

Wigley C, Fletcher J, Davidson J. Ann N Y Acad Sci. 2009 Jul;1169:512-5.

Child Study Centre, School of Psychology, Faculty of Life and Physical Sciences University of Western Australia, 35 Stirling Highway, Crawley 6009, Perth, Australia.

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It is generally agreed that efficiency in processing basic speech sounds is a strong indicator of literacy outcomes. However, there is some debate about the extent to which this capacity is encapsulated within the language system. We report results based on pretest data obtained in an early music training study investigating the **relationship between a motor-rhythmic measure of ability (synchronous tapping) and the purported purely linguistically based processing measures, Rapid Automatized Naming (RAN) and Phonological Awareness (PA).** Results suggest **that RAN ability relies to some extent on nonlinguistic temporal processing skills.**

PMID: 19673833 [PubMed - indexed for MEDLINE]

11. Musical training modulates the development of syntax processing in children.

Jentschke S, Koelsch S. Neuroimage. 2009 Aug 15;47(2):735-44. Epub 2009 May 7.

Max Planck Institute for Human Cognitive and Brain Sciences, Junior Research Group Neurocognition of Music, Stephanstr. 1A, D-04103 Leipzig, German. S.Jentschke@ucl.ac.uk

The question of how musical training can influence perceptual and cognitive abilities of children has been the subject of numerous past studies. However, evidence showing which neural mechanisms underlie changes in cognitive skills in another domain following musical training has remained sparse. Syntax processing in language and music has been shown to rely on overlapping neural resources, and this study compared the neural correlates of language- and

music-syntactic processing between children with and without long-term musical training. Musically trained children had larger amplitudes of the ERAN (early right anterior negativity), elicited by music-syntactic irregularities. Furthermore, the ELAN (early left anterior negativity), **a neurophysiological marker of syntax processing in language, was more strongly developed in these children**, and they furthermore had an enlarged amplitude of a later negativity, assumed to reflect more sustained syntax processing. Thus, our data suggest that the neurophysiological mechanisms **underlying syntax processing in music and language are developed earlier, and more strongly, in children with musical training**.
PMID: 19427908 [PubMed - indexed for MEDLINE]

12. A case study of a five-year-old child with pervasive developmental disorder-not otherwise specified using sound-based interventions.

Nwora AJ, Gee BM. *Occup Ther Int*. 2009;16(1):25-43.

Occupational Therapy Department, D'Youville College, Buffalo, NY 14201, USA.

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The aim of this study was to determine the efficacy of The Listening Program (TLP) in treating a child with pervasive developmental disorder-not otherwise specified (PDD-NOS). Using a single-subject case study design, one child with PDD-NOS was administered a 20-week TLP intervention focused on improving sensory processing and language function. Data collection included pre- and post-evaluations using video footage, and Sensory Profile and Listening Checklist questionnaires. Results of the study indicated improved behaviour and sensory tolerance in the post-intervention video footage, including active participation in singing and movements to song. Sensory Profile and Listening Checklist questionnaires indicated **significant improvements in sensory processing, receptive/expressive listening and language, motor skills, and behavioural/social adjustment at the post-intervention assessment**. Although small in scope, this study highlights the need for continued research by occupational therapists into sound-based interventions. Particularly, occupational therapists need to perform larger-scale studies utilizing TLP to verify the efficacy of this alternative treatment method. 2009 John Wiley & Sons, Ltd

Infants: Research Published in 2009—Abstracts Compiled by Beverly Seng, CMP

1. Does the message matter? The effect of song type on infants' pitch preferences for lullabies and playsongs. Tsang CD, Conrad NJ. *Infant Behav Dev*. 2009 Dec 25. [Epub ahead of print]

Preverbal infants are attuned to the different emotional messages contained in playsongs and lullabies. However, it is unclear which performance properties of singing underlie infants' perception of the communicative intent of infant-directed singing. Volkova, Trehub, and Schellenberg (2006) recently demonstrated that **6- and 7-month-old infants preferred low-pitched to high-pitched renditions of lullabies**, suggesting that pitch may be one performance characteristic that conveys the communicative intent in infant-directed singing. In the current study, we evaluated 6- and 7-month-old infants' natural preferences for unfamiliar, expressive lullabies and playsongs as a function of pitch using a head-turn preference procedure. **Infants preferred low-pitched over high-pitched versions of lullabies and high-pitched over low-pitched versions of playsongs**. Results suggest that the overall pitch of a song is communicative to infants and that the affective nature of music can have an effect on infants' pitch preferences. That is, infants' preferences for pitch are context-dependent. Copyright © 2009 Elsevier Inc. All rights reserved.

PMID: 20036776 [PubMed - as supplied by publisher]

2. **Newborns' Cry Melody Is Shaped by Their Native Language.** Mampe B, Friederici AD, Christophe A, Wermke K. *Curr Biol.* 2009 Nov 4. [Epub ahead of print]

Human fetuses are able to memorize auditory stimuli from the external world by the last trimester of pregnancy, with a particular sensitivity to melody contour in both music and language [1-3]. Newborns prefer their mother's voice over other voices [4-8] and perceive the emotional content of messages conveyed via intonation contours in maternal speech ("motherese") [9]. Their perceptual preference for the surrounding language [10-12] and their ability to distinguish between prosodically different languages [13-15] and pitch changes [16] are based on prosodic information, primarily melody. Adult-like processing of pitch intervals allows newborns to appreciate musical melodies and emotional and linguistic prosody [17]. Although prenatal exposure to native-language prosody influences newborns' perception, the surrounding language affects sound production apparently much later [18]. Here, we analyzed the crying patterns of 30 French and 30 German newborns with respect to their melody and intensity contours. **The French group preferentially produced cries with a rising melody contour, whereas the German group preferentially produced falling contours.** The data show an influence of the surrounding speech prosody on newborns' cry melody, possibly via vocal learning based on biological predispositions.

PMID: 19896378 [PubMed - as supplied by publisher]

3. **Neural representation of transposed melody in infants at 6 months of age.** Tew S, Fujioka T, He C, Trainor L. *Ann N Y Acad Sci.* 2009 Jul;1169:287-90.

We examined adults' and 6-month-old infants' event-related potentials in response to occasional changes (deviants) in a 4-note melody presented at different pitch levels from trial to trial. **In both groups, responses to standard and deviant stimuli differed significantly;** however, adults produced a typical mismatch negativity (MMN), **whereas 6-month-old infants exhibited a slow positive wave.** We conclude that 6-month-old infants, like adults, encode melodic information in terms of relative pitch distances, but that the underlying cortical activity differs significantly from that of adults.

PMID: 19673795 [PubMed - indexed for MEDLINE]

4. **Is beat induction innate or learned? Probing emergent meter perception in adults and newborns using event-related brain potentials.**

Honing H, Ladinig O, Háden GP, Winkler I. *Ann N Y Acad Sci.* 2009 Jul;1169:93-6.

Meter is considered an important structuring mechanism in the perception and experience of rhythm in music. Combining behavioral and electrophysiological measures, in the present study we investigate whether meter is more likely a learned phenomenon, possibly a result of musical expertise, or whether sensitivity to meter is also active in adult nonmusicians and newborn infants. The results provide evidence that meter induction is active in adult nonmusicians and **that beat induction is already functional right after birth.**

PMID: 19673760 [PubMed - indexed for MEDLINE]

5. **The effects of music listening on inconsolable crying in premature infants.**

Keith DR, Russell K, Weaver BS. *J Music Ther.* 2009 Fall;46(3):191-203.

Over the decades, medical staff have developed strategies to manage crying episodes of the critically ill and convalescing premature infant. These episodes of crying occur frequently after infants are removed from ventilation, but before they are able to receive nutrition orally. Not

only are these episodes stressful to infants and upsetting to parents, but they are also stressful and time consuming for the staff that take care of these patients. Although the literature supports the benefits of music therapy in regard to physiological and certain behavioral measures with premature infants, no research exists that explores the use of music therapy with inconsolability related to the "nothing by mouth" status. This study explored the effects of music therapy on the **crying behaviors of critically ill infants classified as inconsolable. Twenty-four premature infants** with gestational age 32-40 weeks received a developmentally appropriate music listening intervention, alternating with days on which no intervention was provided. The results revealed a **significant reduction in the frequency and duration of episodes of inconsolable crying as a result of the music intervention, as well as improved physiological measures including heart rate, respiration rate, oxygen saturation, and mean arterial pressure.** Findings suggest the viability of using recorded music in the absence of a music therapist or the maternal voice to console infants when standard nursing interventions are not effective.

PMID: 19757875 [PubMed - in process]

6. Effects of music on crying behavior of infants and toddlers during physical therapy intervention. Rahlin M, Stefani J. *Pediatr Phys Ther.* 2009 Winter;21(4):325-35.

PURPOSE: This study was designed to investigate the effects of music on the amount of time that infants and toddlers cried during physical therapy sessions. **METHODS:** An A-B-A withdrawal multiple single-subject design was used with 9 infants and toddlers with or at risk for developmental disabilities. **Music was played during therapy in the intervention period but not in the baseline periods.** The number of minutes that the participants cried was documented in a Crying Log. Results were analyzed using a celeration line approach and descriptive statistics. **RESULTS:** Responses to music varied among the participants, **with 6 of 9 children crying less when music was used during therapy.** **CONCLUSIONS:** Infants and toddlers with or at risk for developmental disabilities may benefit from the use of music during physical therapy to reduce crying. Effects of music on other aspects of infant and toddler behavior need to be studied.

PMID: 19923973 [PubMed - in process]

7. Effect of Music by Mozart on Energy Expenditure in Growing Preterm Infants.

Lubetzky R, Mimouni FB, Dollberg S, Reifen R, Ashbel G, Mandel D. *Pediatrics.* 2009 Dec 7. [Epub ahead of print]

Objective: The rate of weight gain in preterm infants who are exposed to music seems to improve. A potential mechanism could be increased metabolic efficiency; therefore, we conducted this study **to test the hypothesis that music by Mozart reduces resting energy expenditure (REE) in growing healthy preterm infants.** **DESIGN:** A prospective, randomized clinical trial with crossover was conducted in 20 healthy, appropriate-weight-for-gestational-age, gavage-fed preterm infants. Infants were randomly assigned to be exposed to a 30-minute period of Mozart music or no music on 2 consecutive days. Metabolic measurements were performed by indirect calorimetry. **Results:** REE was similar during the first 10-minute period of both randomization groups. During the next 10-minute period, **infants who were exposed to music had a significantly lower REE than when not exposed to music (P = .028). This was also true during the third 10-minute period (P = .03). Thus, on average, the effect size of music on REE is a reduction of approximately 10% to 13% from baseline, an effect obtained within 10 to 30 minutes.** **Conclusions:** Exposure to Mozart music significantly lowers REE in healthy preterm infants. We speculate that this effect of music on REE might explain, in part, the improved weight gain that results from this "Mozart effect."

PMID: 19969615 [PubMed - as supplied by publisher]

8. The effect of decibel level of music stimuli and gender on head circumference and physiological responses of premature infants in the NICU.

Cassidy JW. *J Music Ther.* 2009 Fall;46(3):180-90.

The purpose of this study was to examine different protocols with regard to the presentation of music stimuli and compare gender differential reactions to those stimuli. Subjects for this study (N = 63) were premature infants in the Neonatal Intensive Care Unit (NICU) between the gestational ages of 28 and 33 weeks. Half of the experimental infants listened to 20 mins of lullaby music (female voice with orchestral background) on 2 days followed by 20 mins of classical music (Mozart string music) on 2 days. The other half listened to the same music in the reverse order. One quarter of the males and one quarter of the females listened to music presented at an average of 65 dB, one quarter at an average of 70 dB, one quarter at an average of 75 dB, and one quarter did not listen to any music and served as control subjects. Head circumference data were collected four times by the researcher: (a) upon receipt of parental consent, (b) on the first day of music presentation (1 week after consent), (c) on the last day of music presentation, and (d) 1 week after music presentation. Physiological data (heart rate, respiratory rate, oxygen saturation) were recorded by the researcher at 2-minute intervals starting 4 minutes prior to and ending 4 minutes after music presentation. There was a significant difference ($p < .0001$) in average daily head growth across time, but this seems unrelated to the music condition as the same curvilinear trend (larger gain during days of treatment, smaller gain during baseline before and after treatment) was noted for control infants who did not listen to music. Results indicate **a significant ($p = .002$), but biologically unimportant, decrease in heart rate over the course of data collection**. No differences due to gender were noted. PMID: 19757874 [PubMed - in process]

Music in Pediatric Care 2009 Abstracts, compiled by Beverly Seng, CMP

1. School-aged children's experiences of postoperative music medicine on pain, distress, and anxiety. Nilsson S, Kokinsky E, Nilsson U, Sidenvall B, Enskär K. *Paediatr Anaesth.* 2009 Dec;19(12):1184-90. Epub 2009 Oct 23.

Department of Paediatric Anaesthesia and Intensive Care Unit, The Queen Silvia Children's Hospital, Sahlgrenska University Hospital, Göteborg, Sweden. stefan.r.nilsson@vgregion.se
AIM: To test whether postoperative music listening reduces morphine consumption and influence pain, distress, and anxiety after day surgery and to describe the experience of postoperative music listening in school-aged children who had undergone day surgery.
BACKGROUND: Music medicine has been proposed to reduce distress, anxiety, and pain. There has been no other study that evaluates effects of music medicine (MusiCure) in children after minor surgery. METHODS: Numbers of participants who required analgesics, individual doses, objective pain scores (Face, Legs, Activity, Cry, Consolability [FLACC]), vital signs, and administration of anti-emetics were documented during postoperative recovery stay. Self-reported pain (Coloured Analogue Scale [CAS]), distress (**Facial Affective Scale [FAS]**), and anxiety (short State-Trait Anxiety Inventory [STAI]) were recorded before and after surgery. In conjunction with the completed intervention semi-structured qualitative interviews were conducted. RESULTS: Data were recorded from 80 children aged 7-16. Forty participants were randomized to music medicine and another 40 participants to a control group. **We found evidence that children in the music group received less morphine in the postoperative care unit, 1/40 compared to 9/40 in the control group. Children's individual FAS scores were reduced** but no other significant differences between the two groups concerning FAS, CAS, FLACC, short STAI, and vital signs were shown. Children experienced the music as 'calming

and relaxing.' **CONCLUSIONS: Music medicine reduced the requirement of morphine and decreased the distress after minor surgery but did not else influence the postoperative care.** PMID: 19863741 [Pub

2. Role of interactive music in oncological pediatric patients undergoing painful procedures. Bufalini A. Minerva Pediatr. 2009 Aug;61(4):379-389.

Ospedale Pediatrico Anna Meyer di Firenze, Firenze, Italia bufalini.alessandro@libero.it.

AIM: The present study has examined whether interactive music may be considered an effective treatment for the attenuation of anxiety in oncological paediatric patients undergoing painful procedures (lumbar injection, bone marrow aspiration, osteomedullary biopsy and arterial catheter).

METHODS: Thirty-nine tumour patients aged between 2 and 12 were randomised into 2 groups: Music (M) (N. 20) and Controls (N. 19) and were treated by M: conscious sedation and intervention of interactive music and C: sedation. The following factors were assessed: **temperament on the Emotivity, Activity, Sociability scale, anxiety on the Yale preoperative anxiety scale (mYPAS), the induction compliance checklist (ICC)**, parent anxiety by cataloguing the trait-state anxiety inventory, and the degree of satisfaction of children, parents and staff using the Barrera questionnaires. Data significance was accepted with values of $P < 0.05$. **RESULTS: There was a fall in mYPAS values in M compared to C in the four phases of the process:** Phase 1 ($P < 0.05$); Phase 2, 3 and 4 ($P < 0.01$). For the ICC children with a score of ≤ 1 , "collaborated", those with a score of > 1 were "non collaborators"; in the music group the trend was for an increase in the number of collaborating children ($P < 0.07$).

CONCLUSIONS: The M group presents a significant effect of attenuation of anticipatory anxiety and a tendency to great induction compliance compared to group C. The parents do not show any significant anxiety attenuation effect. The degree of satisfaction of children, parents and staff point to a positive role and a beneficial effect of interactive music on the occasion of painful procedures.

PMID: 19752847 [PubMed - as supplied by publisher]

3. Effects of music on anxiety and pain in children with cerebral palsy receiving acupuncture: a randomized controlled trial. Yu H, Liu Y, Li S, Ma X

Int J Nurs Stud. 2009 Nov;46(11):1423-30. Epub 2009 Jun 3.

Department of Acupuncture and Moxibustion, Traditional Chinese Medicine Hospital of Shenzhen, No. 1, Fu-hua Road, Fu-tian District, Shenzhen 518000, Guangdong Province, China.

OBJECTIVES: To study the effects of music on anxiety and pain in children with cerebral palsy receiving acupuncture daily in a clinical setting. **DESIGN:** A randomized controlled trial.

SETTING: Acupuncture Unit at Shenzhen Hospital of Traditional Chinese Medicine in Shenzhen City of China. **PARTICIPANTS:** Sixty children with cerebral palsy undergoing acupuncture. **METHODS:** Intervention: Children listened to their favorite music or a blank disc for 30 min. Measurements: (1) **the modified Yale preoperative anxiety scale for children's anxiety (mYPAS); (2) children's hospital of eastern Ontario pain scale (CHEOPS) and Wong-Baker faces pain rating scale (FACES)** for pain intensity; (3) vital signs including **mean arterial blood pressure (MAP), heart rate (HR) and respiratory rate (RR)**. **RESULTS:** An independent sample t-test showed significantly lower mYPAS scores in the music group 30 min after the intervention compared with the control group ($t=4.72$, $P=0.00$). Significant differences between groups were found in mYPAS scores ($F=4.270$, $d.f.=1$, $P=0.043$, $\text{Partial } \eta^2(2)=0.069$) and over treatment duration ($F=143.421$, $d.f.=1.521$, $P=0.000$, $\text{Partial } \eta^2(2)=0.712$). A significant interaction was also found ($F=4.298$, $d.f.=1.521$, $P=0.025$, $\text{Partial } \eta^2(2)=0.069$). LSD's post hoc testing confirmed that the mYPAS scores significantly increased from the baseline to 1 min ($P=0.000$, 95% CI 14.913, 20.257) and then gradually decreased from 1 to

30min ($P=0.000$, 95% CI -18.952, -13.714). For pain intensity scores, a highly significant time effect was found in both the CHEOPS ($F=87.347$, d.f.=2, $P=0.000$, Partial $\eta(2)=0.601$) and FACES ($F=225.871$, d.f.=1.822, $P=0.000$, Partial $\eta(2)=0.796$), and a significant interaction effect was found as well ($F=4.369$, d.f.=2, $P=0.015$, Partial $\eta(2)=0.070$; $F=5.859$, d.f.=1.822, $P=0.005$, Partial $\eta(2)=0.092$). However, no significant difference between groups was present ($F=2.343$, d.f.=1, $P=0.131$, Partial $\eta(2)=0.039$; $F=3.738$, d.f.=1, $P=0.058$, Partial $\eta(2)=0.061$). Significant differences between groups were found in MAP and HR ($P<0.05$) and over time ($P<0.05$), but no significant effects in RR were apparent ($P>0.05$). A significant interaction effect was found in HR ($P<0.05$), but not in MAP or RR ($P>0.05$). **CONCLUSIONS:** This study demonstrates that **listening to music while receiving acupuncture can relieve anxiety among children with cerebral palsy; however, no effect was observed in terms of pain reduction.** Further research is needed to explore the types of music which best impact an individual's treatment. Whether music results in fewer accidents and side effects of acupuncture should be investigated. Music can be considered as adjunctive therapy in clinical situations that may be anxiety-provoking for children.

4. Effect of sensory adaptation on anxiety of children with developmental disabilities: a new approach. Shapiro M, Melmed RN, Sgan-Cohen HD, Parush S.

Pediatr Dent. 2009 May-Jun;31(3):222-8.

Issie Shapiro Center, Raanana, Israel. micheles@beitissie.org.il

PURPOSE: The aim of this study was to evaluate the **effect of a sensory-adapted dental environment (SADE) on anxiety, relaxation, and cooperation of children with developmental disabilities (CDDs).** Pharmacological treatment has been widely used to reduce anxiety, but nonpharmacological methods may be similarly effective. The standardized clinical situation chosen was a dental hygiene cleaning. **METHODS:** A SADE was structured. Sixteen CDDs participated in an open cross-over intervention trial measuring behavioral and psychophysiological variables. **RESULTS: There was a substantial increase in relaxation and cooperation in the SADE as opposed to the regular dental environment (RDE).** This was reflected by: mean duration of anxious behaviors (SADE = 9.04 minutes vs. RDE = 23.44 minutes; $P < .01$); mean magnitude of anxious behaviors (SADE = 8.49 vs. RDE = 15.50; $P < .01$); cooperation levels (SADE = 331 vs. RDE = 1.94; $P < .01$); mean electrodermal activity (EDA; SADE = 1230 vs. RDE = 446; $P < .001$); and difference in degree of relaxation by EDA (SADE=2014 vs. RDE=763; $P < .004$). **CONCLUSIONS:** The findings indicate the potential importance of considering the sensory-adapted environment as a preferable dental environment for this population.

PMID: 19552227 [PubMed - indexed for MEDLINE]

5. Music therapy may reduce pain and anxiety in children undergoing medical and dental procedures. Bekhuis T.

J Evid Based Dent Pract. 2009 Dec;9(4):213-4.

Center for Dental Informatics School of Dental Medicine, University of Pittsburgh, Pittsburgh, PA 15261, USA. tcb24@dental.pitt.edu

Comment on: Ambul Pediatr. 2008 Mar-Apr;8(2):117-28.

PMID: 19913737

6. Music therapy in an integrated pediatric palliative care program.

Knapp C, Madden V, Wang H, Curtis C, Sloyer P, Shenkman E. Am J Hosp Palliat Care. 2009 Dec-2010 Jan;26(6):449-55. Epub 2009 Aug 7.

Departments of Epidemiology and Health Policy Research, University of Florida, Gainesville,

FL, USA. cak@ichp.ufl.edu

National experts have recommended that children with life-limiting illnesses receive integrated palliative and medical care. These programs offer a variety of services, including music therapy. Using survey data from parents whose were enrolled in Florida's Partners in Care: Together for Kids (PIC:TFK) program, this study investigates parents' experiences with music therapy. About 44% of children with life-limiting illnesses and 17% of their siblings used music therapy. **For children who used music therapy, multivariate results suggest that their parents were 23 times as likely to report satisfaction with the overall PIC:TFK program ($P < .05$) versus parents whose children did not use music therapy. Pediatric palliative care programs should include music therapy, although recruiting licensed music therapists may be challenging.** PMID: 19666889 [PubMed - in process]

7. Music may reduce anxiety during invasive procedures in adolescents and adults.

Newton JT. Evid Based Dent. 2009;10(1):15.

King's College London, London, UK.

Comment on: J Clin Nurs. 2008 Oct;17(19):2654-60.

DESIGN: A block randomised controlled trial was conducted. INTERVENTION: Patients in the music (test) group listened to selected sedative music using headphones throughout the root canal treatment procedure. The control group subjects wore headphones but without the music.

OUTCOME MEASURE: **Anxiety was measured before the study and at the end of the treatment procedure.** Patients' heart rate, blood pressure and finger temperature were measured before the study and every 10 min until the end of the root canal treatment procedure.

RESULTS: The results revealed that there were no significant differences between the two groups for baseline data and procedure-related characteristics, except for gender. **The subjects in the music group, however, showed a significant increase in finger temperature and a decrease in anxiety score over time compared with the control group. The effect size for state anxiety and finger temperature was 0.34 and 0.14, respectively.** CONCLUSIONS: Relaxing music administered through headphones to subjects during root canal treatment decreased the procedure-related anxiety of the patients and significantly increased finger temperature, but **does not significantly affect blood pressure and heart rate over the procedure.**

PMID: 19322222 [PubMed]

8. Exploring the feasibility of a therapeutic music video intervention in adolescents and young adults during stem-cell transplantation.

Burns DS, Robb SL, Haase JE. Cancer Nurs. 2009 Sep-Oct;32(5):E8-E16.

Department of Music and Arts Technology, Purdue School of Engineering and Technology, Indiana University-Purdue University Indianapolis, 535 W. Michigan St., IT 379, Indianapolis, IN 46202, USA. desburns@iupui.edu

The purpose of this study was to explore the feasibility and preliminary efficacy of a therapeutic music video (TMV) intervention for adolescents and young adults (AYAs) undergoing stem-cell transplantation (SCT). Twelve AYAs (aged 11-24 years) were randomized to the TMV or an audio-book protocol. The TMV was designed to diminish symptom distress and improve coping, derived meaning, resilience, and quality of life by supporting AYAs in exploring thoughts and feelings. Six sessions with a board-certified music therapist were held twice a week for 3 weeks. The Adolescent Resilience Model guided the selection of a large, comprehensive battery of outcome measures. Major data collections occurred before admission, after intervention, and at 100 days after transplantation. Participants completed a brief set of measures at pre-session/postsessions 2, 4, and 6. Rates of consent, session completion, and questionnaire

completion supported feasibility. Immediate follow-up measures **suggest positive trends in the TMV group for hope, spirituality, confidence/mastery, and self-transcendence. Positive trends at 100 days include MOS, symptoms distress, defensive coping, spirituality, and self-transcendence.** Therapeutic music video participants also demonstrated gains in quality of life. The TMV intervention may buffer the immediate after-effects of the stem-cell transplantation experience, and a larger study is warranted.
PMID: 19661790 [PubMed - in process]

9. Acupuncture combined with music therapy for treatment of 30 cases of cerebral palsy. Yu HB, Liu YF, Wu LX.

J Tradit Chin Med. 2009 Dec;29(4):243-8.

Department of Acupuncture, Shenzhen TCM Hospital of Guangdong Province, Shenzhen 518000, China.

OBJECTIVE: To observe clinical therapeutic effects of acupuncture combined with music therapy for treatment of cerebral palsy. **METHODS:** Sixty children with cerebral palsy were randomly divided into an acupuncture group (Group Acup.) and an acupuncture plus music group (Group Acup.+ M). Simple acupuncture was applied in Group Acup., and acupuncture at 5 groups of points plus music were applied in Group Acup. +M. The treatment was given once every two days with 3 treatments weekly, and 36 treatments constituted a therapeutic course. Therapeutic effects including movement improvement were observed for comparison after 3 courses of treatments. **RESULTS:** The comprehensive functions were elevated in both groups, and the total effective rate in Group Acup. + M was obviously better than that in Group Acup ($P < 0.05$). Movement functions were also improved in both groups, but the differences in improvement of creeping and kneeling, standing, and walking were significant between the two groups ($P < 0.01$), showing the effect in Group Acup. + M was better than that in Group Acup.. **CONCLUSION: The therapy of acupuncture plus music gained better therapeutic effect on cerebral palsy than simple acupuncture,** which provided new thoughts for treating the disease by comprehensive therapies.

PMID: 20112480 [PubMed - in process]

10. Hearing threshold of Korean adolescents associated with the use of personal music players. Kim MG, Hong SM, Shim HJ, Kim YD, Cha CI, Yeo SG.

Yonsei Med J. 2009 Dec 31;50(6):771-6. Epub 2009 Dec 18.

Department of Otolaryngology, Masan Samsung Hospital, School of Medicine, Sungkyunkwan University, Masan, Korea.

PURPOSE: Hearing loss can lead to a number of disabilities and can reduce quality of life. Noise-induced hearing losses have become more common among adolescents due to increased exposure to personal music players. We, therefore, investigated the use of personal music player among Korean adolescents and the relationship between hearing threshold and usage pattern of portable music players. **MATERIALS AND METHODS:** A total of **490 adolescents were interviewed personally regarding their use of portable music players, including the time and type of player and the type of headphone used.** Pure tone audiometry was performed in each subject. **RESULTS:** Of the 490 subjects, 462 (94.3%) used personal music players and most of them have used the personal music player for 1-3 hours per day during 1-3 years. The most common type of portable music player was the MP3 player, and the most common type of headphone was the earphone (insert type). **Significant elevations of hearing threshold were observed in males, in adolescents who had used portable music players for over 5 years, for those over 15 years in cumulative period and in those who had used earphones.**

CONCLUSION: Portable music players can have a deleterious effect on hearing threshold in adolescents. To preserve hearing, **adolescents should avoid using portable music players for long periods of time and should avoid using earphones.**

PMID: 20046416 [PubMed - in process]

11. Influence of environmental factors on food intake and choice of beverage during meals in teenagers: a laboratory study.

Péneau S, Mekhmoukh A, Chapelot D, Dalix AM, Airinei G, Hercberg S, Bellisle F.

Br J Nutr. 2009 Dec;102(12):1854-9.

INSERM U557, INRA U1125, CNAM EA3200, Université Paris 13, CRNH IdF, Unité de Recherche en Epidémiologie Nutritionnelle, Bobigny, France.

Environmental conditions influence meal size in adults and children. Intake of sweet drinks could contribute significantly to energy intake and potentially affect body weight, particularly in young individuals. The objectives of the present study were to measure the lunch intake of food and drinks under controlled laboratory settings in teenagers and to compare the influence of different meal conditions. Normal-weight adolescents (fourteen males and fifteen females) participated in four standardised lunches, scheduled 1 week apart. The same popular items (meat dish, dessert, water, juice, soda) were served at all meals. Ad libitum intake was measured under four conditions: subjects ate alone; in groups; alone while viewing television; alone while listening to music. Visual analogue scales were used to assess pre- and post-meal hunger and thirst and meal palatability. Energy, solid food and fluid intake was different (significantly lower) only in the 'eating in group' condition, **in spite of identical intensity of pre-meal hunger. More soda was consumed when participants were watching television, and more water was consumed while listening to music.** Across all conditions, more soda than water was consumed. Post-meal ratings of hunger, thirst and palatability did not differ between conditions. We concluded that, in teenagers, a 'social inhibition' effect appears rather than the 'social facilitation' previously reported in adults. Although teenagers do not respond to the presence of television or another 'distractor' such as music by eating more, they do ingest more soda when the television is on. The social significance of meals, conditioned responses and habituation to 'distractors' may be different between adolescents and adults.

PMID: 19682398 [PubMed - in process]

12. From the American Academy of Pediatrics: Policy statement--Impact of music, music lyrics, and music videos on children and youth.

Council on Communications and Media. Pediatrics. 2009 Nov;124(5):1488-94. Epub 2009 Oct 19.

Music plays an important role in the socialization of children and adolescents. Popular music is present almost everywhere, and it is easily available through the radio, various recordings, the Internet, and new technologies, allowing adolescents to hear it in diverse settings and situations, alone or shared with friends. Parents often are unaware of the lyrics to which their children are listening because of the increasing use of downloaded music and headphones. Research on popular music has explored its effects on schoolwork, social interactions, mood and affect, and particularly behavior. The effect that popular music has on children's and adolescents' behavior and emotions is of paramount concern. Lyrics have become more explicit in their references to drugs, sex, and violence over the years, particularly in certain genres. A teenager's preference for certain types of music could be correlated or associated with certain behaviors. As with popular music, the perception and the effect of music-video messages are important, because **research has reported that exposure to violence, sexual messages, sexual stereotypes, and use of substances of abuse in music videos might produce significant changes in behaviors and**

attitudes of young viewers. Pediatricians and parents should be aware of this information. Furthermore, with the evidence portrayed in these studies, it is **essential for pediatricians and parents to take a stand regarding music lyrics.**
PMID: 19841124 [PubMed - indexed for MEDLINE]

13. Exposure to cannabis in popular music and cannabis use among adolescents.

Primack BA, Douglas EL, Kraemer KL.

Addiction. 2009 Dec 22. [Epub ahead of print]

Division of General Internal Medicine, Department of Medicine, University of Pittsburgh School of Medicine, Pittsburgh, PA, USA.

ABSTRACT Background Cannabis use is referenced frequently in American popular music, yet it remains uncertain whether exposure to these references is associated with actual cannabis use. We aimed to determine if exposure to cannabis in popular music is associated independently with current cannabis use in a cohort of urban adolescents. **Methods** We surveyed **all 9th grade students at three large US urban high schools.** We estimated participants' exposure to lyrics referent to cannabis with overall music exposure and content analyses of their favorite artists' songs. **Outcomes included current (past 30 days) and ever use of cannabis.** We used multivariable regression to assess independent associations between exposures and outcomes while controlling for important covariates. **Results Each of the 959 participants was exposed to an estimated 27 cannabis references per day** [correction added on 19 January 2010, after first online publication: 40 has been changed to 27] (**standard deviation = 73** [correction added on 19 January 2010, after first online publication: 104 has been changed to 73]). Twelve per cent (n = 108) were current cannabis users and 32% (n = 286) had ever used cannabis. **Compared with those in the lowest tertile of total cannabis exposure in music, those in the highest tertile of exposure were almost twice as likely to have used cannabis in the past 30 days** (odds ratio = 1.83; 95% confidence interval = 1.04, 3.22), **even after adjusting for socio-demographic variables, personality characteristics and parenting style.** As expected, however, there was no significant relationship between our cannabis exposure variable and a sham outcome variable of alcohol use. **Conclusions** This study supports an independent association between exposure to cannabis in popular music and early cannabis use among urban American adolescents.

PMID: 20039860 [PubMed - as supplied by publisher]