

## 1: Benefits of Music for Premature Infants

*Music therapy -- in particular, the use of live, entrained (matched, in the moment with the infant's breathing rate) breath and heart beat sounds -- as well as parent-preferred lullabies can enhance a premature infant's vitals and provide opportunities for bonding.*

Health May 31, 4: Ninety minutes later, I was allowed to formally meet him. He had wires and tubes everywhere and was attached to a breathing device called a CPAP that forced air into his lungs. Seeing him for the first time was scary, overwhelming, and one of the greatest moments of my life. I never knew I could love something this much in an instant. He came so early we did not even have a name until his second day of life. The nurses and doctors were nothing but positive that by end of his stay, he would lose all these wires and cords and just be Bradley. I received a text from my weeks-pregnant wife saying that her water might have broken. In order to be released, the NICU doctors told us he would need to gain weight on a consistent basis, about an ounce every couple days, breathe without machine assistance, and learn to suck and swallow. He might face invasive painful procedures if his body was not developing properly or there were any complications. We were told over and over again that this process of him growing and adjusting to life outside the womb would be stressful, not just for his parents, but for him. We were given a timeline of 10 to 16 weeks, but there was no predicting how long it would take him to meet these markers. This idea of music therapy helping premature babies weighing as little as a pound reduce their days in the NICU sparked my curiosity. Terry Rubin with his son, Bradley. Photo courtesy of the author I began to talk to the other parents in the NICU and asked if they were taking part in the music therapy services. To my surprise, most were, and admitted that it did help calm their children. He spent more than three months in the NICU going through a couple surgeries to remove fluid from his brain before he was released. The three full-time and 14 intern music therapists at Mt. The study followed premature infants in 11 hospitals and found that the music, provided by a certified music therapist, offered stress relief for the parents too. Choosing a song that connects culturally to the family helps build a family bond. If the parents are Indian, they will have no relevance with an American lullaby. Currently, we are recording a Hebrew prayer in the key of the mom, to work with the baby so that there is continuity of care when he goes home. King song that connected to her childhood and her father who passed away. They are the conductors. Lisa Eiland, head of neonatal care at Mount Sinai West Hospital, has embraced this type of intervention. She says anytime you can reduce the stress off the patient, it helps with healing and in the case of premature babies, it can help in development. It is stressful when a baby first tries to learn to eat. Anything to help them take the edge off can help them progress at a faster rate. Music therapy can help fill that gap and soothe the baby until the parents can be there or until the baby goes home. Medical music therapy has also been used for oncology patients. Eiland believes this therapy can be used in any medical situation where there is a pattern of high stress on patients in treatment and recovery. This price tag can make it prohibitive for hospitals. As for us, I can attest my son benefited from the music therapy, and we still sing him the songs: An earlier version of the story incorrectly identified a company that makes the instruments used in the NICU. The company is Remo Belli. A music therapist plays guitar for babies admitted to the NICU. Photo by Terry Rubin Go Deeper.

### 2: Music therapy for premature infants in Finland – amiamusica

*Collectively, the studies of live music and/or recorded music, which have measured the effects of music itself and/or music therapy on premature infants have not yet evaluated specific elements of music, entrained, in the moment, to the infant's vitals.*

View Larger Image More nordic insights – music therapy with premature infants in Sweden More international insights. Guest author Pernilla Hugoson from Sweden shares her thoughts and experiences with music therapy in neonatal care. Interested about a unique feature for parents at Swedish neonatal care units? Suddenly life has changed and everything is about survival from one day to another. They also need to have space where they can share feelings and thoughts about their situation. It is not easy to become a parent in this hightech environment and therefore it is important to create possibilities for parents and babies to experience each other through the senses, smell, touch and hearing and to be able to connect emotionally. From the very beginning, Swedish parents are supported in being the primary caregivers to their newborn baby. I am working with a family-centered music therapy intervention. Its aim is to support and strengthen parents to sing and hum for their baby during skin-to-skin contact, the so called kangaroo care. The focus is to encourage or even to empower the parents to using their unique voices as a possibility for them to be in touch with their baby both physically and emotionally. Of course, the meeting with each family is individualized and formed out of their unique situation. I always work with both parents and baby present. It can be both when the baby is taken care of in the acute care room or when the family has been moving to a family room. It seeks to support families and the professionals who care for them. Find out more, e. Experts from the United States describe it as a partnership approach to health care decision-making between the family and health care provider Kuo et al. *Matern Child Health J* This helps to create moments of closeness for the family so they can relax. I use my voice for singing, for humming and for improvising. You need to be very flexible and creative in finding ways to inspire and encourage parents to dare using their voices in the environment of the NICU. It can be challenging for parents. Not everybody has the courage to use her or his voice. Sometimes, they are also emotionally blocked and it is difficult for them to sing. Then I start with the breathing and very cautiously guide them to simply breathe in and out. Jonas Nyhav When the parents feel ready, we add sound during the exhalation. I often encourage parents to try this when they are on their own or during kangarooing when no one else is present except their baby. It is imperative to not put any pressure on the parents! Just gently, smoothly and with great respect for their integrity offer a way to start using their voice and a way to get used to how it sounds. For some parents, letting the melody of the spoken language be transformed into a singinglike manner is helpful. Others simply listen to my voice and the monochord, which gives them an opportunity to relax together with their baby. Yet, some parents love to mutually sing lullabies or other childrens songs. Again, the parents are in charge of what songs we sing. It supports and sometimes even eases the transition to parenthood. They are all given the possibility to attune to each other emotionally. These moments are of high importance for attachment and bonding to develop. What motivates me It is inspiring to be part of a journey, in which each family develops unique strategies for handling their situation. Parents also strongly express their need to be parents in the NICU and to take care of their baby. It is such a grace to be invited to share and to follow a family through their time at our ward, in both sorrow and happiness.

## 3: How music therapy helped my premature baby | PBS NewsHour

*Music therapy is a structured intervention to deliver music with the purpose of achieving specific therapeutic goals (e.g., reduce stress) that improves the clinical condition of the patient. 18 In a recent review, Standley 19 found that music therapy is used to improve feeding in hospitalized premature infants, which may have the positive.*

This article has been cited by other articles in PMC. Premature infants are subjected to many painful procedures during care and treatment. The aim of this study was to assess the effect of music therapy on physiological and behavioral pain responses of premature infants during and after blood sampling. This study was a cross-over clinical trial conducted on 20 infants in a hospital affiliated to Tehran University of Medical Sciences for a 5-month period. In the experimental group, Transitions music was played from 5 min before until 10 min after blood sampling. All steps and measurements, except music therapy, were the same for the control group. Music therapy reduces the physiological and behavioral responses of pain during and after blood sampling. Data from the International Center for Health Statistics indicates that the percentage of premature infant births was 10.6% in 2010. Being subjected to frequent painful stimuli in the beginning of their lives might have long-term effects such as behavioral changes, changes in their stress response, and a future susceptibility to psychosomatic problems and mental disorders. Nonpharmacological interventions, which include environmental and behavioral interventions, are useful in infants either independently or coupled with pharmacological treatments. For the preterm infant, care provided in the neonatal intensive care unit NICU disrupts this normal cycle of exposure to sensory events. Infants were studied randomly; once as an experimental subject and once as a control, each infant was considered as its own control to eliminate the influence of individual characteristics. A cross-over pattern was used to select participants for the control and experimental groups. The researcher used block randomization in order to determine whether each infant should be studied first in either the experimental or control group. The inclusion criteria for the study were: Weight lower than 1500 g; gestational age of at least 29 weeks and a maximum of 36 weeks; having no congenital disorder, or any auditory disability during physical examination; having no intracranial hemorrhage or neurological problems; no sedatives administered within the last 24 h; having an order for blood sampling and different areas of blood sampling for the two different samplings. The exclusion criteria were: First, the researcher went to the study environment to obtain permission and introduce herself to the ward in-charge. Then she identified and selected premature infants qualified to participate in the research. According to the design of the study and objectives, the total sample size determined was 20 infants. Each infant was studied in two groups of experimental and control. So, totally 40 infants were studied. The researcher measured pain responses induced by blood sampling in these selected premature infants. The site of blood sampling was brachial or radial artery. In this study, pain response means physiological and behavioral pain responses. In order to measure physiological response factors, heart rate and oxygen saturation were recorded, and to measure behavioral response factors, sleep-wake state and facial expressions of pain were used. The tools used in this study included a questionnaire containing demographic information, a form for recording physiological signals, a form for recording sleep-wake state, and the neonatal facial coding system NFCS scale. Infant sleep-wake states were coded as follows: There was an interval of at least 1 day between the control and experimental processes for each infant. For each experiment or control, recording was done with two cameras 10 min before blood sampling, during sampling, and this continued until 10 min after sampling. Then the films were reviewed accurately by the computer and the physiological and behavioral changes were detected. For the experimental group, music was played from 5 min before blood sampling and continued until 10 min after sampling. These sounds were recorded from the uterus of a pregnant woman using an ultrasonic Doppler and mixing them with a song sung by a woman. The music volume was adjusted to 60 dB through the TES sound meter. Physiological and behavioral signals in the ground state before playing the music were scored by the researcher through watching the films for 5 min; also, after playing the music before blood sampling for 5 min, during sampling immediately after the skin injection and removal of the needle, and after sampling at 10 min, they were recorded. Each one of the behavioral and physiological items was

recorded at 5 s intervals through watching the films and then averaging each minute. In order to blind the researcher, while watching the films, the researcher was not informed whether the infant was exposed to music therapy or not. To achieve this, during review of the films, the computer speakers were turned off. To analyze the findings, considering the effect of the period and carryover effect for quantitative parameters, an analysis of variance ANOVA with a random effect was used. Although the project looks like a parallel project, cross-over studies cannot use independent t-test or paired t-test due to the confounding effects such as period effect and transitional effect. In order to control these effects, analysis should be made in variance of analysis model. In this model, the difference between the effects of the two treatment groups can be measured easily and without the effect of confounding factors. Obtaining permission from the relevant authorities, getting written permission from the Ethical Research Committee of Tehran University of Medical Sciences, describing the objectives of the research to the parents of infants, and obtaining their informed consent to participate in the research. Parents were free to leave the study at any time, and permission was also obtained from Dr. Apgar scores, weight at birth (g), and gestational age (29–36 weeks). Owing to the fact that each infant in this study was both in the control and experimental groups, both of these groups were homogenous in terms of many demographic parameters. As a result, it can be emphatically claimed that the obtained results are influenced by the effect of intervention. At the second 5 min before blood sampling in which music was played for the experimental group before blood sampling, there was no significant statistical difference between the experimental and control groups in terms of heart rate, oxygen saturation, and facial expressions of the infant. In the blood sampling stage injection and withdrawal of the needle, there was a significant difference between experimental and control groups in terms of sleep–wake state during injection and in terms of heart rate during withdrawal of the needle. The first 5 min after blood sampling showed a significant difference between the two groups in terms of heart rate, sleep–wake state, and infant facial expressions. Playing music influenced their behavioral signals as well as one of their physiological responses, and this caused the premature infants to resume ground state and decreased their pain responses. However, Chou et al. Music has positive effects on physical, emotional, and spiritual well-being. It is suggested that this research should be repeated with a higher number of samples and using different types of music to measure the effect of different types of music. The higher scores on these indices in the control group indicate that these infants require a great deal of energy to adjust to the pain induced by blood sampling, on the other hand, a decrease of these indices in the experimental group implies that the infants experience lower pain levels and, as a result, they can store their energy for their growth and development. In this study, it seemed that playing music was as an effective intervention after performing painful procedures such as blood sampling for premature infants hospitalized in the NICU. Conflicts of interest There are no conflicts of interest. Acknowledgements This article is derived from a master thesis affiliated to Tehran University of Medical Sciences and the registered code number in Research Deputy of Tehran University of Medical Sciences is . The researchers of this study would like to offer their sincere thanks to all the hospital authorities, staff of the neonatal intensive care unit, and the mothers of infants who participated in this research for their cooperation. The University of Alabama at Birmingham; Using new satellite based exposure methods to study the association between pregnancy PM2. Sheikh BE, Raei V. An acute pain assessment tool. A clinical validation study. *Int J Nurs Pract*. Guidelines for procedural pain in the newborn. Buonocore G, Bellieni CV. Music as a nursing intervention for preterm infants in the NICU. Effects of music therapy on oxygen saturation in premature infants receiving endotracheal suctioning. Exposure to maternal voice in preterm infants: The effectiveness of music in pediatric healthcare: A systematic review of randomized controlled trials. *Evid Based Complement Alternat Med*. Music therapy and health benefits. Does prone or supine position influence pain responses in preterm infants at 32 weeks gestational age? Bedside application of the Neonatal Facial Coding System in pain assessment of premature neonates. *The Design and Analysis of Clinical Experiments*. John Wiley and Sons; The efficacy of non-pharmacological interventions in the management of procedural pain in preterm and term neonates. A systematic literature review. Effects of music therapy on preterm infants in the neonatal intensive care unit. *Altern Ther Health Med*. Music modulates behaviour of premature infants following heel lance. *Can J Nurs Res*. The effect of music listening on physiological responses of premature infants in the NICU. The effect of

melody on the physiological responses of heel sticks pain in neonates. Iran J Nurs Midwifery Res. The effects of music listening on inconsolable crying in premature infants. Impact of music therapy on breast milk secretion in mothers of premature newborns. J Clin Diagn Res.

## 4: Lullaby for Pain Management in the NICU - Music Therapy Research Blog

*She is an internationally recognized researcher, has authored numerous books and refereed articles, is the current editor of the Journal of Music Therapy, and is the Director of the National Institute for Infant and Child Medical Music Therapy.*

Experts led by Dr. Manoj Kumar of the University of Alberta, Canada, analyzed nine clinical trials and found that music had a beneficial effect on lessening pain for preterm babies undergoing painful procedures such as heel prick blood tests. It also appeared to benefit full-term babies during operations. The research, published in the Archives of Disease in Childhood, included trials published between and looking at music and heart rate, oxygen levels and pain levels. Most of the trials used lullabies with or without added sounds such as heartbeats or womb noises. One used live music, a specially composed wordless lullaby sung by a female voice and accompanied by a harp. Additional methodologically rigorous, randomized controlled trials are warranted to confirm and to further elucidate the benefits of music for neonates before any specific recommendation for the use of music can be made in the neonatal population. Benefits are thought to include calmer infants and parents, more chance of reaching a stable condition, faster weight gain and shorter stays in hospital. A team from Bern in Switzerland looked at the advantages of playing music to newborns in neonatal intensive care units. They explain that these babies are exposed to a high number of painful procedures. The team add that non-drug treatment methods are increasingly being investigated for pain prevention and pain relief. They searched the research and identified 13 good-quality studies and two previous analyses of music and other approaches including swaddling and maternal touch. Different forms of music have been used in trials: Regardless of the type of music, a positive effect on the pain response was invariably recorded, say the Swiss team. Outcomes included the regulation and reduction of the pulse rate, more rapid physical recovery, a rise in oxygen levels and a reduction in the excitation state. Music was particularly effective at decreasing the pain response when combined with sucking on pacifiers. But the researchers running these trials were in agreement that music should not be played for more than 15 minutes per session, in order to avoid sensory overload. They played half an hour of Mozart on two consecutive days to ten healthy preterm infants, and no music to a further ten infants. Further rigorous research on the subject is still needed, she adds. Music for medical indications in the neonatal period: A systematic review of randomised controlled trials. Archives of Disease in Childhood, published online May 27, The efficacy of non-pharmacological interventions in the management of procedural pain in preterm and term neonates. A systematic literature review. European Journal of Pain, Vol. Effect of music by Mozart on energy expenditure in growing preterm infants. Music as a nursing intervention for preterm infants in the NICU. Music Benefits Preterm Babies. Retrieved on November 15, , from <https://>

## 5: Baltimore Sun - We are currently unavailable in your region

*A comprehensive international collection of writings on music therapy with premature and newborn infants in Neonatal Intensive Care Units. The book includes different approaches to research and clinical practice, based on interdisciplinary knowledge and current research.*

## 6: More nordic insights â€“ music therapy with premature infants in Sweden â€“ amiamusica

*I am a music therapist from Helsinki, Finland, and I work with families on a neonatal ward in Jorvi Hospital, [www.enganchecubano.com](http://www.enganchecubano.com) the ward we have family-centered care, which means that parents are actively taking part in the care of their infants as much as possible.*

## 7: How Music Therapy Helps Premies | HuffPost Life

*The analysis, of over a dozen clinical trials, found that music therapy helped stabilize premature newborns' breathing rate during their time in the neonatal intensive care unit (NICU).*

### 8: Music Therapy Helps Premie Babies Thrive

*The study followed premature infants in 11 hospitals and found that the music, provided by a certified music therapist, offered stress relief for the parents too.*

### 9: Music Therapy for Premature and Newborn Infants

*The analysis, of over a dozen clinical trials, found that music therapy helped stabilize premature newborns' breathing rate during their time in the neonatal intensive care unit (NICU). For the most part, music therapy involved mothers singing to their babies (though some studies used recordings of mom's voice).*

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