

Instituting a Music Listening Intervention for Critically Ill Patients Receiving Mechanical Ventilation: Exemplars From Two Patient Cases

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Abstract

Music is an ideal intervention to reduce anxiety and promote relaxation in critically ill patients receiving mechanical ventilatory support. This article reviews the basis for a music listening intervention and describes 2 case examples with patients utilizing a music listening intervention to illustrate the implementation and use of the music listening protocol in this dynamic environment. The case examples illustrate the importance and necessity of engaging a music therapist not only in assessing the music preferences of patients, but also for implementing a music listening protocol to manage the varied and challenging needs of patients in the critical care setting. Additionally, the case examples presented in this article demonstrate the wide array of music patients prefer and how the ease of a music listening protocol allows mechanically ventilated patients to engage in managing their own anxiety during this distressful experience.

Keywords

music intervention, mechanical ventilation, music therapy

Mechanical Ventilation and the Intensive Care Unit Environment

Mechanical ventilation (MV) is a common intensive care unit (ICU) modality to treat respiratory failure from a variety of causes. In the United States, more than 1 million persons annually admitted to ICUs receive MV, usually for less than 48 hours.¹ However, approximately 34% of these patients require prolonged ventilatory support (PVS), and this rate is increasing.¹

Patients on MV often experience distress and anxiety due to many factors including the endotracheal tube, the critical care environment, and the critical illness.² Additionally, the presence of the endotracheal tube prevents verbal communication. Both being hospitalized in an ICU and the physiological stress of a critical illness itself present a great source of distress for patients. The usual treatment of reducing anxiety and distress that arise from mechanical ventilatory support is the administration of intravenous sedative agents. While these medications are indicated at times to reduce stress and promote breathing comfort and synchrony with the mechanical ventilator, they have numerous side effects, which can delay weaning and prolong ventilator support. There is a need to implement adjunctive, nonpharmacologic interventions that can reduce anxiety in this patient population such as relaxing music. The purpose of this article is to present the basis for a music listening

intervention and to highlight case examples of implementing a music listening intervention with 2 critically ill, mechanically ventilated patients enrolled in a randomized trial to test anxiety self-management strategies. The importance of continuous, professional assessment of music preferences by a music therapist is emphasized to meet the specialized and unique needs of mechanically ventilated patients in order to facilitate the implementation of the music listening protocol.

Overview of the Randomized Clinical Trial

The overall aim of our randomized clinical trial is to determine the effect of individually preferred, relaxing music on anxiety self-management in critically ill patients receiving mechanical ventilatory support. Secondary aims are to determine whether

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preferred relaxing music leads to shorter time receiving mechanical ventilatory support, shorter length of ICU stay, and explores the influence of relaxing music on stress in ventilated patients. This study has been approved by the parent Institutional Review Board ([IRB] University of Minnesota) and all of the participating sites' IRBs. Alert, mechanically ventilated patients are recruited from 5 medical centers in the Minneapolis—St. Paul urban area, resulting in a total of 12 participating ICUs.

Patients who are consistently following commands, participating in their daily care, and can provide informed consent are approached. Participants are randomly assigned to 1 of the 3 conditions: (1) experimental group of patient-directed music (PDM) listening whereby they listen to music specially assembled by a music therapist that complements their music preferences whenever they like and for as long as they like, (2) active control condition of noise-canceling headphones whereby participants wear headphones to block out ICU noise whenever desired, and (3) control group of usual ICU care for the respective unit. Equipment (compact disks [CDs] and headphones) is kept at the participant's bedside to enable self-initiation whenever desired. Patients remain in the study as long as they are receiving mechanical ventilatory support in the ICU, for up to 30 days. Anxiety is assessed daily with 2 paper-and-pencil instruments, a 6-item shortened version of the Spielberger State Anxiety Inventory,³ and a 100-mm visual analog scale—*anxiety*.

Basis for a Music Listening Intervention for Mechanically Ventilated Patients

Music therapy is a nonpharmacologic modality that can be utilized to manage anxiety and stress and is a therapeutic modality provided by a board-certified music therapist. In the music therapy process, patient strengths and needs are assessed in order to develop an appropriate plan of care. Patients in a variety of clinical settings receiving music therapy have shown significant decreases in heart rate, systolic and diastolic pressure, respiratory rates, and anxiety.^{4,5} Recent research explored the use of music therapy as a means of managing stress for mechanically ventilated patients being weaned from the ventilator. Hunter et al reported high satisfaction rates for patients and nurses and that music therapy was successful in treating anxiety associated with weaning from MV.⁶

In contrast to music therapy provided by a specially trained and board-certified music therapist, a music listening intervention is a self-administered intervention or one that requires minimal assistance from a music therapist for the patient to listen to music to manage anxiety, stress, pain, discomfort, or to serve as a means of distraction. This type of intervention is designed to empower a patient to utilize the music whenever they may need it and as often as they need it. This type of non-pharmacological and patient-directed approach gives the patient options to manage their symptoms even when a music therapist is not present or available. Music listening interventions are ideal for the ICU environment and mechanically

ventilated patients specifically because this type of intervention requires limited energy for the patient to utilize and is a simple intervention for a patient to self-administer. Patient-directed music interventions allow patients to have control over the implementation of the intervention whenever they feel they may need it and it gives them constant access to a nonpharmacological option. This also ensures the patient has constant access to the music, as a music therapist cannot be available 24 hours a day.

Despite the numerous challenges in the chaotic critical care environment and the medical complexity of patients, nonpharmacologic, adjunctive interventions, such as music, can provide the mechanically ventilated patient with alternative and meaningful stimuli while promoting relaxation. Music listening interventions are useful for ICU patients receiving mechanical ventilatory support for many reasons. First, the intervention is not demanding of a patient and it does not require focused concentration on a stimulus, as does imagery or biofeedback. This is important for mechanically ventilated patients since they are critically ill and have low energy states with limited concentration ability. Also, music is a comforting, familiar stimulus that patients can use to distract and calm them during this stressful ICU and mechanical ventilatory experience.

Previous research has shown that as little as 30 minutes of listening to preferred music can induce relaxation and reduce anxiety in ICU patients receiving mechanical ventilatory support.^{4,7,8} Music is safe for these patients and no untoward side effects have been reported in those who listened to music. However, not all of the previous investigations provided participants with choice or control over the type of music used. Allowing patients to choose music ensures they are selecting their preferred music, not being given music that may be unfamiliar or they may find to be unpleasant, which could cause undue strain. The assessment process the music therapist conducts helps to determine the music that the patient prefers and minimizes any negative responses to music.

More recent research is demonstrating the benefits of a focus on patient selected and patient preferred music.^{9,10} Research findings demonstrate that when patients self-select music, this promotes tolerance during distressful procedures and significantly reduces anxiety.¹¹⁻¹³ Additionally, the research demonstrates that when patients have a familiarity with the music and have control over the music selection, they have a greater physiological response to the music.¹⁴ Bradt, Dileo, and Grocke in a recent Cochrane Review conclude that while music interventions demonstrate a beneficial effect on heart rate, respiratory rate, and anxiety, the overall quality of the evidence is not strong. The investigators recommend more research on the effects of music with mechanically ventilated patients when it is offered by a trained music therapist.¹⁵

Importance of Assessing Music Preferences With Mechanically Ventilated Patients

When implementing a music listening intervention, it is important to determine the type or types of music the patient

prefers. An assessment of music preferences by a professional music therapist is crucial for determining what type/types of music to offer. However, a strategy for assessing music preference in a simple yet comprehensive format is needed for patients with energy limitations and communication challenges, such as those who are critically ill and receiving mechanical ventilatory support. In response to this need, Chlan and Heiderscheit developed a music assessment intervention tool (MAT), which is currently being utilized in the above detailed randomized controlled trial.¹⁶

The MAT includes a section on biographical data to gather information on age, gender, reason for admission, and length of admission to date. Additionally the assessment tool includes questions regarding whether the individual is a musician, whether they enjoy listening to music and if so when they listen to music. The larger portion of the assessment is focused on identifying specific genres and styles of music the patient likes and dislikes as well as instrumentation that is preferred and those sounds that are not preferred. The MAT includes questions to identify specific groups or artists the patient likes and dislikes. This allows the music therapist to further narrow the preferences and what the patient would most like to listen to and to have knowledge of what music the patient would not like to receive. Teasing out these preferences is important as a patient may indicate they prefer country music, but they do not like Garth Brooks or they only like old country music.

The MAT is designed in a checklist format to allow for greater ease and efficiency in gathering the information. Mechanically ventilated patients tire easily, so it is important to be able to gather pertinent and thorough information as quickly as possible. Additionally, an understanding of the limitations of critically ill mechanically ventilated patients is vital. These patients have limited energy and significant communication challenges. These challenges require the music therapist to be effective and efficient in the assessment process. This can be achieved by having a variety of strategies for communicating with patients, which may include simply responding with yes/no responses, mouthing their answers, writing their responses, or having family members communicate information for them. It is important that the music therapist possesses a vast knowledge of music, musical genres, various groups, and artists in these genres as this allows greater ease in gathering the information and making this process less taxing on the patient. Use of the MAT provides efficiency and ease in the assessment process and a method of effectively obtaining information on music preferences.

It is important to note that a critical care or intensive care environment is highly technical and must be navigated carefully, due to the fragile nature of the health status of the patients. The inherent stressful nature of this environment and the critical state of the patient's health also create a great deal of anxiety for family members and loved ones. Stepping into this setting requires a music therapist to understand the nature of MV, how this impacts a patient and his or her family, strictly adhere to any isolation/infection control precautions on the unit prior to entering a patient room, and communicate directly with

the patient's care team. Thus, it is imperative that the music therapist understands this environment and navigates this dynamic setting carefully.

To highlight the powerful impact of music listening interventions on patients receiving mechanical ventilator support, 2 case exemplars are presented from participants in the randomized trial. The importance of ongoing assessment is central to the success of this intervention. Each case further illustrates the impact of patient preferred music and the expertise of the music therapist on addressing the needs of the patients. The music listening protocol for this study is as follows. After randomization to the patient-directed experimental music listening group, the research nurse provides participants with a set of noise-canceling headphones (Maxell headphones model HP/NPII) and a portable CD/MP3 player (Sony D-NF430 or JWIN JX-CD988), along with a starter set of several CDs containing a variety of relaxing instrumental music selections. All equipments are kept within easy reach at the participant's bedside. The research nurse contacts the music therapist immediately after a new participant is randomized to the music listening condition.

The starter set of CDs ensures that participants begin listening to music even prior to the initial meet with the music therapist. The listening device was selected for ease of patient in operating the equipment, as the intervention is self-administered by the patient. The CDs provided for the participants were burned in MP3 format to allow for greater amounts of music to be included. The music therapist follows a strict adherence to the copyright laws, and all music utilized in this study are purchased and original copies of the music maintained. Participants were invited to begin listening whenever they wanted and for as long as they wanted.

In this study, it is important to note that participants were required to provide their own consent for participation. This requires that patients were receiving little or no sedation that would enable them to give the consent. This also ensured that participants would be able to operate the portable MP3 player independently, since this music listening protocol was a patient-directed protocol. The music therapist assessed the participants within 24 hours of enrollment in the study. During this initial assessment, the music therapist would work to discover the participants' music preferences, beginning with discovering their preferred genres and then the artists and groups within those genres. The following day that music would be delivered and added to the participants' music collection. Each day during the participants' enrollment in the study, the music therapist would continue to reassess their music preferences and continue to bring any additional music the participant identified they would like. This entails that everyday the music therapist would meet with the participants and ascertain whether they were listening to and enjoying their music and inquire about any new or additional music they may like to receive. This ongoing assessment also allowed for the fact that as participants listened to their music, they may begin to recall other music they like and could then request this music as well. Since these participants were critically ill, they were not always

able to recall all the music they prefer at the time of the initial assessment. Therefore, providing an ongoing assessment allowed the music therapist to be thorough in providing their preferred music and to assist in facilitating their music listening experience.

Participants and nursing staff were reminded that the participants could determine when, how long, and what they wanted to listen to at any given time. The music and portable disc player were kept within the reach of the participant so that they could use it whenever they chose to and at their convenience. The music listening intervention was available to participants at all times during their enrollment throughout the study.

Music Listening Intervention: Case Exemplar #1

David was a 50-year-old caucasian male admitted to the ICU for mechanical ventilatory support due to acute respiratory distress syndrome, previous to a heart and lung transplant. Over the years since the organ transplants, David had developed several comorbid conditions from the numerous antirejection medications, including renal failure requiring frequent kidney dialysis. When the music therapist first met with him to assess his music preferences, he was able to roughly write the names of groups and artists that he preferred. His energy level was very low and he struggled to write, so he would only write a portion of the group or artists name and the music therapist had to ascertain who he was referring to in the limited information he was able to provide. This required the music therapist to monitor his energy level and to limit the number of questions asked to not put undo strain on David. During the initial assessment, David indicated he liked Creedence Clearwater Revival, rhythm and blues (including BB King and Eric Clapton). He also indicated at this time that he did not like country music. Due to his limited energy, this was as much information that could be gathered at this time.

The music therapist returned the next day with the music David requested. He immediately wanted to begin listening to this music and indicated through hand gestures that he would like the music therapist to place it in the MP3 player for him. During each subsequent and daily visit by the music therapist, David requested additional and more specific music each time. David began to trust that the music he preferred and requested would indeed be included in the music listening protocol and that participating in the research protocol would not limit his music choices or that he would be given music that the researcher/researchers determined he should listen to.

Each day the music therapist delivered new music to him he asked her to put a new CD in the portable MP3 player and he would begin listening to this new music immediately. The music therapist continued to assess his music preferences during each daily visit for any new music he might like. On one visit he indicated he liked Johnny Cash, although he had previously indicated that he did not like country music. The ongoing assessment of his music preferences permitted the music therapist to tease out the nuances of his likes and dislikes in order to

maximize his listening as a method to self-manage anxiety. The daily interactions with this study participant highlight the crucial aspect of ongoing assessment when implementing music listening interventions over a prolonged period. The interactions during this ongoing assessment also allow the music therapist to provide the participant with some information and coaching on how the music listening protocol can be helpful and times when they may find it helpful.

While it is evident that most patients have an understanding or intuitively know that listening to music is enjoyable, they do not have an understanding of the many other functions of music. When the music therapist is providing the participant's music, this is an opportunity to inform them on how music can be helpful to them during this hospitalization. Additionally, while participant's that are mechanically ventilated may be receiving sedative or pain medications, it is important to reiterate this information during subsequent visits. Helping the participant develop this understanding of the music not only empowers them to use this patient-directed tool but also can help them understand that while many aspects are beyond their control, listening to the music is one thing they can do to help themselves.

Since David's hospitalization was a prolonged stay, he was enrolled in the study for a maximum of 30 days. The ongoing assessment process further allowed the music therapist to explore the depths of his music and listening preferences. This provided the music therapist with a great deal of information to compile just over 30 CDs for David to utilize during his hospitalization. This gave him a wide array of options for when he wanted to listen to music and ensured that he would have the music he wanted to listen to as well. So little during this hospitalization was under his control, but he had control over his music. It was evident by his facial expressions, gratitude, and frequent use of the protocol that the music gave him comfort and pleasure.

As David's ICU stay progressed and his medical condition deteriorated, he began to experience muscle weakness and became less able to communicate via writing. His family then provided the music therapist with lists and suggestions of other music that he liked or was a part of his personal music collection at home. The input from his family allowed the music therapist to continue to build his music listening collection despite the communication challenges and his failing medical status. This did require the music therapist to adapt the ongoing method of assessment and communication to David's changing needs and abilities.

The personalized music collection became a means of coping and comfort for this patient in the face of his declining medical status. He was able to use his music collection choices as a source of personal control despite his grave medical prognosis. David's need for frequent hemodialysis was an event fraught with great stress and anxiety due to the effect of this necessary medical treatment on his blood pressure. David would become extremely anxious prior to his frequent dialysis treatments and would request an antianxiety medication, which would unfortunately cause his blood pressure to drop during

dialysis. Another medication would then need to be administered to increase his blood pressure to a more acceptable range. This became a vicious cycle of anxiety and administration of a variety of medications during each dialysis treatment.

David's nurses began to understand how much he enjoyed listening to the music and using the listening protocol. They had observed him using the protocol time and time again and noted how it helped him relax. One day with coaching from his nurse, David was able to focus his attention on listening to a favorite CD instead of the stressors surrounding dialysis. David was able to use the music as a means of distraction and relaxation as he navigated through his dialysis treatment. This shift in his focus afforded him the ability to manage his stress and anxiety during the treatment, which prevented the need for the anti-anxiety medication and then subsequently the medication to increase his blood pressure. This would not have been possible without the expert guidance and assembly of the individually preferred music for this study participant.

The effectiveness of the music listening protocol for David was evident in his frequent use of music and his willingness and ability to use the protocol during his dialysis treatments to manage his stress and anxiety. Unfortunately, David's condition continued to deteriorate and he passed away in the ICU.

Music Listening Intervention: Case Exemplar #2

Bob was a 71-year-old male admitted to the ICU following a spinal fusion and decompression surgery eventually requiring MV due to respiratory failure. Unfortunately, Bob was from out of state and was visiting his family in Minnesota when he required the surgical procedure and hospitalization. Bob had a very tenuous course in the ICU, with many setbacks and complications, which do occur at times in patients who are very ill. Bob was already in the ICU for 10 days prior to being enrolled in the study and had received a tracheostomy tube due to his need for a PVS.

He and his wife reported he was an avid music listener, and he enthusiastically embraced the PDM listening intervention. He had mentioned on several occasions that he did not enjoy watching television, which led to many long days in the ICU once his medical condition stabilized. When the music therapist met with him, he was eager to share his music preferences and he appeared to welcome and enjoy these interactions. He communicated that his preferred music was classical and jazz, more specifically including Dave Brubeck, Diana Krall, Mozart, Bach, and Beethoven, along with several others.

Bob was not able to speak due to his intubation; his preferred method of communicating was to mouth the words for the music therapist. The music therapist would then speak his response so he could confirm to her understanding of what he was trying to communicate. The process required the music therapist to quickly learn the nuances of what he was trying to say. Additionally, Bob enjoyed these opportunities to share his music preferences and it was important for the music therapist

to be mindful of how much energy he was expending and not engaging him to the point of exhaustion.

Since Bob did not spend time watching television, he spent long periods of time listening to music. The music therapist understood that Bob was a long time music enthusiast and that he found greater pleasure in listening to music. Since he was already motivated to listen to the music, helping him understand the benefits to listening to music further fostered his listening and gave him at least one way to help himself during this hospitalization. While Bob had always loved music, learning about how listening to music could be beneficial to him was new information. He welcomed this information and the music listening protocol became a primary, self-administered, therapeutic tool for him.

Music listening became his way of coping with the stresses of being critically ill, his lengthy and tumultuous hospitalization, and dealing with hospital staff. Listening to music allowed him to be distracted from the stressors of the hospital environment and from his physical discomfort, listening to music he likes gave him a great sense of pleasure which positively impacted this challenging hospital experience. Just prior to Bob's discharge from the hospital, he commented that the music is what helped him make it through his lengthy and difficult hospitalization.

Discussion

For both David and Bob, the music listening intervention served as a valuable means of coping with and managing their challenging and prolonged hospitalization experiences. The ongoing assessment process was an important component for them as well. David needed time to trust that the music he requested would be what was provided to him, that he would not be given music someone else thought he should listen to. Further, the ongoing assessment process provided for additional interactions, which fostered rapport and a greater level of trust. As it became evident to David that he would receive the music he requested, he was more forthcoming with his requests. Each day the music therapist brought him the latest music he had requested, he gestured to listen to it immediately. The expressions of joy and contentment on his face as he began to listen to this new music communicated the pleasure and comfort it gave him during this challenging time.

As David's health began to decline, his ability to respond and interact varied from day to day. Therefore, the daily, ongoing assessment and follow-up were necessary to ensure that a comprehensive evaluation of his preferences to provide the music he wanted and needed to foster the ongoing implementation of the listening intervention. The music listening became a way for him to continue to manage the health challenges he faced, so while he could not control what was happening to his health, he could listen to music he liked to cope with the reality of his situation.

In comparison, upon the initial assessment, Bob was so eager to immediately engage in sharing his music preferences and in utilizing the music listening intervention. His affective

shifted when the music therapist visited him each day, as he enjoyed receiving the new music that was delivered during these visits. The nursing staff and his wife frequently commented on how happy Bob was when the music therapist visited. He welcomed any opportunity to not only share his music preferences but also request additional music. His passion and love for music had long been his primary means of entertainment and enjoyment in life, and during his hospitalization it was his primary method for distraction, coping, and relaxation.

While the process of assessment varied in these 2 cases, the consistent and daily assessment served an important part of discerning, fine-tuning, and providing their preferred music. Additionally, helping both David and Bob further understand that listening to the music was more than just an enjoyable experience, and that the music could serve as a helpful tool for relaxation and comfort during this challenging time. Informing, educating, and coaching them on how to use the music further fostered the use of the listening intervention and their sense of empowerment during their MV.

Due to their fragile health status, the assessment process needed to be ongoing and flexible in order to adjust to the changing needs of David and Bob and to address their desire for new and additional music. An important consideration when working with patients in a critical care environment is they may only be able to share small amounts or pieces of information here and there as communication itself is difficult and taxing due to the MV. Therefore, the initial assessment will not likely be comprehensive, as they do not have the energy to respond. Participants may also find it difficult to recall information at times due to receipt of pain or sedative medications, or because of the stressful nature of the experience. Therefore assessing and collecting information in an ongoing manner allows the music therapist to be thorough in what information is gathered over time. The assessment must be ongoing in order to gather and obtain a complete and comprehensive understanding of the participant's music preferences. The ongoing assessment ensures the music therapist can be responsive to changes that can occur to the participants on a daily basis and help them tailor their use of music to their changing needs in this dynamic environment.

Summary

A music listening intervention is a tool that can be implemented as a patient-directed protocol with the assistance of a board-certified music therapist. The music therapist can assess the music preferences of the patient, supply the music for patient use, and teach the patient and staff how and when to implement the listening intervention to best meet their needs. This nonpharmacological intervention can be a successful tool for patients to actively engage in managing symptoms, anxiety, and distress, as well as provide distraction from the stressful critical care environment. The music therapist serves a vital role in not only obtaining information regarding individual music preferences but in helping patients and staff understand when it can be helpful to implement the listening protocol, how to best do so, and understand why this is a valuable option for the patient.

Music listening can be a powerful intervention for patients with limited energy, such as those who are critically ill and receiving ventilator support, and can provide a simple, yet effective means of personal control during a very stressful experience. With the guidance and support of a trained music therapist, patients, their family members, and nursing staff can better understand and experience how music can be more than just a nicety in the critical care environment. The music therapist can help educate and foster understanding of the benefits and uses of music during this time, so that music becomes a nonpharmacological necessity in managing stress and anxiety during MV.

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