

At a Crossroads: Big Questions—Little Knowledge in Achievements, With Issues of Translation

Music and Medicine
3(4) 209-212
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DOI: 10.1177/1943862111418121
http://mmd.sagepub.com



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The scientific community feels disillusioned. In spite of massive support for basic research and science in expansive arenas, in rare instances are results seeming to justify the effort. We see an example of this, for instance in genetics. When the DNA sequence of the human genome was identified in 2000, it was predicted that within a decade personalized medicine would be achieved.^{1,2} That revolution has yet to come. Epigenetics, proteomics, metabolomics—developing disciplines with titled terms suggesting that we understand basic principles of biological and behavioral life in human beings. In actuality, we are not yet capable of processing and analyzing the amount of data collected necessary to describe our observations. Big questions have created no sufficient or practically relevant answers but have led to more big questions.

Experienced therapists and physicians might have given us a warning and prepared us for this unrest. They know it is not that easy to gather, define, and interpret multiple sources of facts and figures, and it probably will not become any easier in the future as our understanding of the disciplines becomes more defined and our quest for knowledge remains insatiable. In healthcare most of the concepts employed in daily practice are a collective summary which contain centuries of experience. About 90% of all the so-called traditional medicine is based upon experience, not on randomized, controlled, double-blind studies.

Is it possible that we ask our questions and develop our hypotheses in the wrong way? Is the dichotomy, the artificial separation between basic and applied science leading us not only to a crossroad but rather toward a dead end? Certainly, some of the greatest outcomes have presented as surprises—they came as a jewel, an unexpected finding that we had not set out to investigate. Just accidentally Alexander Flemming discovered penicillin while doing bacteriological studies in his laboratory in 1928. His discovery led to a new era in medical treatment that saved millions of lives.³ The term “integrative” implies that we are seeking to look at other disciplines, and we are aiming to be not only further educated in those disciplines but inclusive of the effects that the integration may provide. We are seeking more knowledge and hoping to understand the impact of multiple factors which provide for multiple possibilities.

May we propose to join forces. Joining basic science with practical experience may bring progress. Increasing

opportunities for translation of science into practice as an integrated part of our research endeavors may reap benefits. Music Therapy and Music Medicine provide paradigms for such inclusive approaches.

As fascinating as music-related results of brain imaging studies, as well as research in genetics and behavioral sciences may be, translation into practice must follow now. Thus the recent program of the IX International ISMM MusicMedicine Symposium held at Augsburg College Minneapolis, Minnesota, United States, with focus on clinical field excursions and applied research presentations provided for such a forum. The range of presentations covered such areas as hospice care for children, care for caregivers in dementia care, music for severely ill patients in intensive care units, brain imaging studies about how and “where” musical parameters and activities are processed, and how these processes change our brains indicate integrative aspects of clinical activity and research. The recent conference at Rice University’s Shepherd School on Mind and Music which focused on topics such as music, memory and emotion, and the brain, pitch, imagery, and emotion is also indicative of a growing integration. The inaugural International Association for Music and Medicine (IAMM) conference in Vienna earlier in the year hosted doctors, nurses, and music therapists seeking integration of research and practice, with evidence shared along with the growth of clinical practice.

Identified specific target areas of interest for urgent integrative (in the above-mentioned sense) research might include⁴:

Epigenetics—environmentally induced modifications in the human genome have been identified. The genes for

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musical aptitude have been located. What consequences does this imply with reference to music therapy and music medicine?

Resilience—how can music enhance our capacity to withstand and cope with posttraumatic stress disorders?

Prevention—while it has been identified as the most important issue in modern healthcare not at least with respect to cost containment, the importance of music interventions in prevention is widely untapped.

Placebo—placebo effect and music processing have a biological background which can be monitored in the human brain in overlapping regions—is music (also) a placebo? Does it depend on timing? Some recent findings show that placebo activates pain control areas in the brain and reward systems.⁵⁻⁷ This is not unlike music. Although there is yet no direct proof that music works in a similar way to a placebo, it is an interesting point to consider. When one thinks in detail about the brain and functional magnetic resonance imaging (fMRI), the fMRI alone does not tell much. Behavioral and clinical data, for instance, should accompany such brain imaging studies on music. This may be difficult to do, but we believe it is necessary.

Based on Cochrane Reviews in the field which clearly outline steadily growing evidence for clinical music therapy and music medicine, these issues are in need of focused and joint attention.

In this issue of *Music and Medicine* again various aspects of integration are evident. We see a smattering of music and medical modalities with articles addressing pain, critical illness, and procedures within a broad array of populations.

Costanza Preti and Graham Welch begin this edition with research on the impact of a live music program in pediatrics. The inclusion of caregivers on all of the participants involved (musicians, children, and hospital staff) and the impact this can have upon healing, especially for children makes this study unique. Integration of many sounds and instruments including winds and strings in the hospital is another broadened context the readers will appreciate. The focus of a qualitative methodology on how the live music influences the listeners' perceptions and the way this study incorporates familiar music is exemplary, as too often in well-designed studies the methodology does not include patient-preferred music.

In the next article, interesting cross-cultural effects of music listening are explored by Barbara Wheeler, Estate Sokhadze, Joshua Baruth, Gene Ann Behrens, and Carla F. Quinn. *Music and Medicine* is committed to both the psychophysiological responses to music and furthermore to the significance that diverse interpretations may have in the construction of music investigations. Too often it is assumed that "music" as a "stimulus" or "process-oriented" approach produces a specific effect upon a specific condition with a specific population. Research has left out the influence of how emotions are in fact experienced and/or described, and the undertones of cultural influence. One may think that having a "minority inclusion"

in a research proposal fulfills an obligation or protocol criteria. This research compared the experience and effects of musically induced emotions and subjective measures of arousal and valence, providing valuable considerations through the musical study of 2 cultures. It is an interesting article that represents broad thinking for clinicians and researchers alike.

Oshin Vartanian and Peter Suedfeld's unique investigation studies music improvisation in college students. The effects of a flotation version of Restricted Environmental Stimulation Technique (REST) on jazz improvisation and the results of this preliminary exciting research lead us to evidence that applied concentration may be a critical element in our perceptual-motor agility which affects our ability to improvise.

Instituting a music-listening intervention program in a medical setting comes with numerous challenges. This is especially the case for critically ill patients. Protocols involving everything from safety to sterility need to be employed with care. Central to such institution is integration. Annie Heiderscheit, Linda Chlan, and Kim Donley's exemplars of in-depth case studies involving fragile patients receiving mechanical ventilation provide a rich example of how careful teamwork filters into patient care. The broad range of music used which was based on preference and how the ease of a music-listening protocol empowered their patients' experience provides the reader with important ideas for implementing protocols with this largely musically underserved population.

Surprisingly there has not been a great deal of writing on the process-oriented use of music in psychotherapy with patients who have psychotic episodes. Trisha Ready's musical preference as meta-communication provides a rich means for undertaking process analyses and reporting. Ready builds upon her astute psychologically based clinical inferences and experiences, implementing theory from the music therapy literature and deftly guides a most difficult journey with a patient who experienced a host of emotions in the early stages of psychosis. Ready's capacity to study and reflect on the critical importance of music listening with her patient provides rich data on how to "articulate" and "contain" using music as an artifact and anchor.

Early accounts of relaxation reflect research in dental arenas, but not so much of late in the use of music and music therapy in dentistry. Manish Bhagania and Anirudha Agnihotry's "Extraction of a Grossly Decayed Tooth Without Local Anesthesia and With Audio Analgesia—A Case Report" reflects again the impact of patient-selected music. This article provides through case example an option for people who choose not to have pharmacological anesthesia. This case reflects an important exemplar of how music may be an effective means of sedation and furthermore that music as an audio-analgesic can provide for the amelioration of pain.

Chemobrain is a developing concern for those who undergo chemotherapy treatments.⁸ Although patients reflect time and again that chemotherapy can affect their ability to think clearly, there is a notable lack of research and investigations which explore the value that music may provide during and after chemotherapy treatment courses. Debra Burns and her team,

Tonya Bergeson, Susan Perkins, Brenna McDonald, Andrew Saykin, Fred Unverzagt, and Victoria Champion begin this important and notable first investigation by viewing music cognition post chemotherapy, among survivors of breast cancer. Melodic areas of cognitive processing lead to some interesting inferences.

Nicolas Silvestrini, Valérie Piguet, Christine Cedraschi, and Marcel Zentner leave our readers with a variety of essential questions and some confirmed answers about music's role in pain reduction. They ask, is music's capacity to affect change in pain an auditory distraction reduction that is based on emotional or attentional processes? This is an important question as most clinicians would agree that playing music and listening to music involve multiple systems of physiological functioning. A growing number of music therapists are recognizing that there are limits to reporting that music merely "distracts." This study provides some interesting implications, but perhaps the most useful being that music can provide strength, endurance, and resilience which may be of critical significance to those who are working in procedural or surgical hospital environments.

For the first time, in this issue of *Music and Medicine* we are reprinting an article that we hope will be of interest to our readers. Since the inception and within the development of this journal, as Editors we, along with our Editorial Board, first encouraged, and last year made the requirement that each article submitted specify details about the music-based and music therapeutic interventions. It is imperative to the growth of our research and clinical activity.

As Editors, we noticed that little attention was given to the source as a stimulus or intervention; and this is the most critical aspect of the medical-clinical-therapeutic process. In fact, quite honestly, it has not been uncommon for us to receive submissions which have instituted scientifically stringent measurements with regard to methodology and data collection and analyses, but which have failed to address contextual considerations of music construction and application. We have returned these articles to the authors. We do not want to repeat problems of other journals that throughout the past decade typically limit, or have omitted altogether, an identification and discussion of the music employed in music medicine and music therapy interventions. "Music" is often described in a most generalized way and clinicians and researchers who wish to replicate or further develop a concept or intervention are left with a lack of detail for how "music" was used. In such circumstances, how could a future investigator know how music should be implemented or further developed in a music-based or therapeutically implemented clinical intervention?

We are impressed and pleased that Robb et al⁹ have written a well developed paradigm for reporting specific guidelines in order to develop more "transparency" and "specificity of reporting" music based investigations. Their guidelines, which were created from CONSORT and TREND, offer readers concrete evidence-based substantiation for the inclusion of specific information when reporting music-based interventions.

Currently, in the clinical research-based investigations of music and medicine, therapy processes can be described and

analyzed quantitatively as well as qualitatively achieving reasonable and responsible control of the music therapeutic intervention. In fact, mixed designs are favored. In being stringent in the ways Robb et al have recognized, we fulfill the same standards of excellence as any other medical therapy would endure in being subject to similar adherence to controls of quality and effectiveness. The future of our research, clinical activity and the reputation of music therapy and music medicine inclusive of its acknowledgement by the medical community depend on how we meet the scientific and therapeutic standards of state of the art health care.

In a very real way we will always have to consider the realization that art itself cannot be quantified, so there is often the need for purely qualitative description of the therapeutic means that are employed. However, we should seek to define that we are doing so by clearly outlining the structured content of the music. This includes such parameters as instrumentation, natural sound versus synthesized sound, melody structure, harmony, timbre, rhythm, tempo, and duration of the application and volume, technical equipment used, environmental setting, and noise level.¹⁰

Robb et al's recommendation that investigators provide rationale for the selected music in expectation of its effect in impacting targeted outcomes is well placed. We appreciate the authors' permission to reprint this article which emphasizes the need for musical interventions and consideration of selection implementation to be comparable and therefore reproducible. We are grateful that this writing reminds our readership of our guidelines which recognizably will afford other researchers and practitioners the opportunity to advance practices in music-based intervention study in their respective settings. Of note is that the authors generously end the article with a checklist which they affirm "may be reprinted and used without permission as a tool to help ensure transparent reporting of music-based interventions."⁹

As Editors we are pleased that the submissions to this issue address the work of clinicians and researchers in a particularly difficult area, pain. We are also grateful that the populations served are focused on some new areas, and conditions which have not yet been addressed; cross-cultural implications—similarities and differences, cognition effects post chemotherapy, dental procedure, and mechanical ventilation. It is impressive that medical- and musical-based interventions are becoming more fully integrated into protocols that will ultimately influence standards of care—this will have implications in our continued growth.

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