

## **Information about the Critically Appraised Topic (CAT) Series**

The objective of the Doctor of Nursing Practice (DNP) program at George Mason University is to prepare graduates for the highest level of nursing practice. Emphasis is placed on evaluating and applying the evidence that supports practice, understanding and creating practice delivery systems based on patient outcomes, and assuming leadership roles in practice settings. Graduates of the program will be able to assume many roles in the health care system, including direct patient care, clinical nursing faculty, practice management, and policy development.

All DNP students take an evidence-based practice course titled Evidence Based Practice in Nursing and Healthcare (NURS 883). This hallmark course for the DNP program builds on knowledge of research methodologies to analyze the selection and evaluation of research underlying evidence based practice. Emphasis is placed on the translation of research in practice, the evaluation of practice and the improvement of the reliability of health care practice and outcomes.

The first assignment students complete is a Critically Appraised Topic (CAT). CATs are mini-systematic reviews and considered a snapshot of the literature on a topic of interest. Students critically appraise literature related to a focused clinical question and summarize the best available research evidence on the topic of interest. CATs conclude with clinical bottom lines for practitioners to quickly take away for consideration in practice.

The CATs published in MARS (Mason Archival Repository Service; [mars.gmu.edu](http://mars.gmu.edu)) are submitted by students after they have been reviewed, revised, and approved by their instructor. All CATs are current at the time of original publication but will not be updated over time.

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## Utilizing Music Therapy in Cardiac Catheterization Laboratories

**Purpose:** To determine if music therapy makes a positive difference in patients undergoing cardiac catheterization.

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**Question:** In patients undergoing cardiac catheterization, are feelings of anxiety improved by a music therapy intervention versus usual care?

**Search Strategies and Results:** The EBSCO HOST search engine was used to search the CINAHL, MEDLINE, PubMed, PsycNet, ProQuest, and Cochrane databases. Terms used included: “cardiac catheterization,” “percutaneous coronary intervention,” “angioplasty,” “angiography,” “anxiety,” “psychological,” and “music therapy.” The search yielded 26 articles from 2001 to 2011. Six randomized controlled trials (RCTs) with similar outcome measures were identified. Of these six RCTs, three with similar intervention implementations were selected for critical appraisal.

### Articles:

1. Chang, H.K., Peng, T.C., Wang, J.H., and Lai, H.L. (2011). Psychophysiological responses to sedative music in patients awaiting cardiac catheterization examination: A randomized controlled trial. *Journal for Cardiovascular Nursing*, 26(5), E11-E18. doi: 10.1097/JCN.0b013e3181fb711b
2. Goertz, W., Dominick, K., Heussen, N., & vom Dahl, J. (2010). Music in the cath lab: who should select it? *Clinical Research in Cardiology: Official Journal of the German Cardiac Society*, 100(5), 395-402. doi: 10.1007/s00392-010-0256-1
3. Weeks, B.P., & Nilsson, U. (2010). Music interventions in patients during coronary angiographic procedures: A randomized controlled study of the effect on patients' anxiety and well-being. *European Journal of Cardiovascular Nursing: Journal of the Working Group on Cardiovascular Nursing of the European Society of Cardiology*, 10(2), 88-93. doi: 10.1016/j.ejcnurse.2010.07.002

### Evidence:

**Chang et al.:** A group of 54 patients (32 male, 22 female) scheduled to undergo a cardiac catheterization procedure was randomly assigned to either an experimental music-listening group or a non-music listening group who received the usual care and quiet rest. Changes in patient anxiety level were measured with the State-Trait Anxiety Inventory (STAI) along with physiological changes in heart rate, heart rate variance, and skin temperature. The music-listening group experienced a significantly reduced state of anxiety ( $P = .003$ ). Both groups noticed beneficial effects of decreased heart rate and increased skin temperature (all  $P < .001$ ). Effects of the treatment of heart rate variability for both groups were inconclusive. Further, subjects who reported enjoying the music they were listening to also reported lower perceived anxiety levels ( $P = .05$ ).

**Strengths:** To achieve a power of 0.8 at  $\alpha = 0.5$ , with a medium effect size, a medium correlation ( $r = 0.50$ ) among repeated measures, and using repeated measures analysis of covariance on skin temperature, the size of each group in the study was computed to be 27. Subjects were randomized to groups.

**Weakness:** Having a larger sample size would have given the study more generalizability to other cardiac cath lab patient populations. Having the additional outcome measures of blood pressure and respiratory rate would have been useful data to consider, which this study did not assess. It may have further helped to have the intervention done during the cath lab procedures to help determine if music therapy before and during the cath lab procedure provides better anxiety reduction than just the pre-procedure time period that this study details.

**Goertz et al.:** A group of 200 patients (134 males, 63 female) undergoing elective cardiac catheterization at a hospital in Germany were randomized to either a Group A and allowed to select the genre of music (including the option of 'no music') they listened to during the cardiac procedure or a Group B and listened to music during the cardiac procedure, but were randomly assigned to listen to one of the music options given to Group A (not allowed to select the music genre themselves). The randomized controlled trial (Oxford Level 1b) utilized the State-Trait Anxiety Inventory (STAI) to assess any changes in patient anxiety. All patients in Group B who listened to music showed a significantly higher decrease in anxiety level compared to Group A ( $p = 0.0176$ ). Patients who did not listen to any music had a significantly weaker reduction of anxiety compared to all those who did listen to music ( $p = <0.0001$ ). Although it was expected that Group A would have experienced greater anxiety reduction due to the ability to choose their own music, Group B showed greater anxiety reduction post intervention, interestingly disproving one of the study's hypotheses.

**Strengths:** The randomization in choosing the patients in the study and the randomization in assigning them to Group A or B (with further randomization of music type that Group B subjects listened to) allows for the sample to be generalizable and representative to the cardiac cath lab patient. ANCOVA was used to evaluate the reported change in anxiety levels via STAI. All tests were two-sided and assessed at the 5% significance level. The sample size of 200 patients also lends to the generalizable credibility of the study. The majority of the sample was male (68%), but this is not unusual for cardiac cath lab patient populations.

**Weaknesses:** The addition of a pre-procedural music therapy intervention would have given the study further breadth in determining whether or not a pre-procedural intervention enhanced the anxiety-reducing effects of the intra-procedure intervention.

**Weeks et al.:** A group of 98 patients (47 males, 51 females) undergoing elective coronary angiogram and/or percutaneous coronary intervention were stratified into three groups to obtain equal representation for gender after randomization. The control group received no music intervention while the remaining two groups received the music intervention either via cath lab loudspeakers or via audio pillow. Once the intervention was complete, a numeric rating scale was used to obtain well-being level and sound environment quality from the patients. A significantly higher anxiety score was recorded in the control group when compared to the loudspeaker music group ( $p < 0.05$ ). Further, a significantly more positive well-being response was measured in the two music intervention groups when compared to the no music intervention group. Also, a significantly more positive impression of the sound environment was found in the pillow speaker group compared to the two other groups ( $p < 0.05$ ).

**Strengths:** Stratification into three groups to obtain equal gender representation was a notable factor. The investigators were blinded to the treatment selected for the subjects until after the subjects had consented to the study.

**Weaknesses:** The study only measured patients' anxiety after the intervention was complete. No baseline anxiety scores were obtained before the procedure began. Having a pre-procedure baseline would have

made that date more thorough. No sample size was calculated and the study's generalizability could have been strengthened with a larger sample size.

**Clinical Bottom Line:** Cardiovascular disease is a leading health problem in the United States. Cardiac catheterizations are considered the gold standard in terms of identifying and, if appropriate, correcting the structural insults to the heart brought on by the disease. Patients' experiences in cardiac cath labs are commonly accompanied by anxiety, which can decrease a patient's sense of well-being while increasing the workload of the heart through increased blood pressure, heart rate and respiratory rate. Music therapy holds great promise as a non-invasive, simple, safe, and effective intervention that can improve patient anxiety while decreasing cardiac workload. The studies reviewed show sufficient evidence that music therapy can be a worthwhile addition to current patient care in cardiac cath labs. Further research is needed to demonstrate the use of music therapy in cardiac cath labs in males and females of all ages.