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Cover: "Lady in Repose 28 x 22 pastel. Anita Ashley was born in New York City. Trained in Europe she was influenced by Mary Cassatt.

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EDITORIAI

Dale B. Taylor

For those of us whose daily concerns are in the many disciplines comprising the field of arts medicine, a major concern is the artists whose health is entrusted to our expertise, and the patients whose participation in the arts becomes their avenue toward recovery. While the well-being of these individuals shall remain our primary goal, we must also be concerned with the perception and image of our services within the professions as well as its place in the minds of the general public. Without support from colleagues, funding agencies, administrators, and consumers, our ability to provide performing arts medicine and arts therapy services may be severely limited.

The occurrence of such problems could stem from our own selection of terms to describe subcategories of arts medicine. The term Performing Arts Medicine clearly refers to medical concerns of musicians, dancers, actors, and others who perform before an audience. There are also subheadings such as MusicMedicine and Dance Medicine that seem to fall under Performing Arts Medicine. However, other performers such as professional speakers—actors, announcers, news anchors—are not presently represented by a comparable subheading although they are subject to the same kinds of problems of overuse and incorrect practices that afflict musicians and dancers. Those who could build, paint, and prepare the sets and those who design and create the costumes used on stage are also creative artists and are integral to the artistic endeavor performed for the audience. Should there be subheadings such as Voice Medicine and Stage Art Medicine to address the medical concerns of these populations?

An important area of concern largely overlooked is the area of sculpture, an art form that often involves the use of materials and energy sources that may be toxic, although the artist often is not aware of these dangers. Such materials must also be stored and disposed of in ways that are not harmful to health. Without proper handling of these substances, the sculptor, painter, and certain other artists must work in an environment that presents a real health hazard although its presence is not always clear to those whose health is threatened. Perhaps the importance of addressing these types of health risks would be given more attention if an area that could be known as Environmental Arts Medicine existed as a subcategory of Arts Medicine. The contents of this Journal could quite appropriately include studies of the handling of toxic materials in the arts, use of various forms of energy in creating and presenting artistic products, and the effects of these factors on the health of the artists. As with music and dance medicine, a related avenue of effort should then be a concentrated campaign to teach arts educators the importance of providing this information to students.

What is being suggested herein is not necessarily a change of terminology, although some expansion of the terminology used in this young field may be in order as described above. The issue is the need for more effective modes of communication with those who would utilize and support arts medicine services. It is believed that enhanced awareness and understanding may be achieved through an expansion of our own knowledge of the full scope of arts medicine and clarification of the terms used to describe our concerns.

THE EFFECTS OF THE MALE AND FEMALE SINGING AND SPEAKING VOICES ON SELECTED PHYSIOLOGICAL AND BEHAVIORAL MEASURES OF PREMATURE INFANTS IN THE INTENSIVE CARE UNIT

Jacquelyn Michele Coleman, Rosalie Rebollo Pratt, Ronald A. Stoddard, Dale R. Gerstmann, and Hans-Henning Abel

An Independent Groups model with a complex cross-over design using multiple treatments was employed. Infants in the experimental group (n = *33) were compared with infants in the control group* (n = *33) for caloric intake, weight, and Newborn Intensive Care Unit (NICU) stay. Infants in the experimental group received a 4-day intervention with three 20-minute segments, consisting of three randomly ordered periods of male/female, singing/speaking, and NICU noise. Singing lowered heart rate* ($p < 0.0176$)*, increased oxygen saturation* ($p < 0.0078$)*, and reduced distress behaviors* ($p < 0.0001$)*. Infants responded equally to male and female voices. Compared to the control group, infants in the experimental group left the NICU 3 days earlier, and experienced significantly higher caloric intake and weight gain* ($p < .05$)*. Male and female singing voices have positive physiological and behavioral effects on premature infants.*

Introduction

Preterm infants are high risk patients who have more developed hearing than visual abilities, with an apparent linkage between auditory and visual activity (Blackburn, 1983).

The premature infant has an intense need for sleep due to immaturity and lack of oxygen reaching the brain once the baby is born (Collins & Kuck, 1991). Malloy (1979) reports that the neonatal brain is vulnerable at birth and is in need of an enriched environment to achieve normal sensory development. Since stress levels and low birth weight can negatively affect the premature infant (Blackburn), a stabilizing, sensitive sound environment is needed to bring the baby to normal levels of health and function (Collins & Kuck).

Measures in designing and selecting environmental improvements and more positive parental attention are top priorities for health professionals, whose major goal should be to maintain an atmosphere that is comfortable and conducive to increased health and rest (Resnick et al., 1987; Blackburn). Sound stimulation, particularly through vocal music, may be a simple and cost-effective way to do so (Caine, 1991; Resnick et al.).

Interventions with the appropriate use of sound, including music, can efficiently enhance the well-being of the infant without adding to the expense of monitoring equipment in the unit (Collins & Kuck; Caine, 1991; Resnick et al.; Chapman, 1978). Neonatal intensive care ranks among the most costly of all hospital admissions (Ladden, 1990). Phibbs et al. (1981) report three measures of risk: low birth weight, surgical intervention, and assisted ventilation. Laddon discovered that the average expenditure for a very low birth weight survivor (VLBW) ranges from $31,000 to $71,000.

Unwanted environmental loudness, noises, and disturbances have been discussed in several studies (White-Traut, 1994; Caine, 1991; Chapman). White-Traut states that loudness and noise in the NICU often exceed safe levels. An infant needs an environment in which he can eat, gain weight, and develop properly (White-Traut). Caine (1991) concurs that the NICU can create stress and inhibit normal development.

Music in the NICU may improve certain behavioral and physiological measures, such as heart rate, oxygen intake, and respiration rate (Caine, 1991; Chapman). Music, particularly the sound of the voice, may draw the attention of premature babies away from mechanical sounds and instill a more humanizing element into the NICU, thus increasing desirable growth and overall health state.

Lullabies have been used to soothe babies throughout recorded history (Pratt, 1985). Papousek (1994) claims that lullabies are particularly suitable for studies on universal qualities of infant-directed songs because of the uniformity of performance and interactional conditions. The male and female voice singing lullabies, might be a natural way to help premature infants recover well and in a timely manner.

Review of the Literature

The importance of early multiple interventions with infants has been stressed in the literature

(Simeonsson, Cooper, & Scheiner, 1982). Of the auditory, visual, and tactile modalities, sound has been found to be the most effective in decreasing the stress behaviors of full-term neonates (Caine; Malloy; Chapman). The effects of the mother's voice on the infant have been studied by Katz (1971) and Segall (1972). No study to date has attempted to show the effects of the male voice, independent of the female voice, on premature infants.

Cossu, Faienza, and Capone (1996) addressed the differing computational processes involving speech and music integration in infants. Language and music showed a striking discrepancy in the distribution of spectral patterns across the two hemispheres; specifically, theta was more activated by speech than by music. It was suggested also that intricate and selective processing occurs at or near the time of birth and could have effects on later outcomes.

Null Hypotheses

1. There will be no significant difference in heart rate and oxygen saturation as physiological measures of responses to the male and female singing and speaking voices among babies in the experimental group.
2. There will be no significant difference in observations of the selected distress behaviors during intervention among babies in the experimental group.
3. There will be no significant difference in caloric intake, weight increase, and length of time in the NICU during unit stay between babies in the experimental group receiving musical and spoken stimulation and babies in the control group not receiving this stimulation.

Method

Description of Subjects

Thirty-three subjects meeting all experimental criteria were tested in the experimental group, while 33 carefully matched infants comprised the control group. Infants in the control group were closely paired with those in the experimental group according to gender, gestational age, and weight proximity, and were born within the same year as those in the experimental group. The inclusionary criteria for all subjects were: 25.5–34.5 weeks gestational age, with 5-minute APGAR scores 7 and above, weight appropriate to age/length, and placement in open or closed isolettes. In addition, only infants on the standard 3-hour feeding schedules were included.

Exclusionary criteria were: No neurologically impaired or severely hearing impaired infants, or infants with 5-minute APGAR scores less than 7.

Interview With the Parents

Subjects were randomly chosen from the available pool, following which, parents were interviewed and asked to sign a consent form.

Materials

The voices of three male baritones and three female mezzo sopranos were prerecorded on audiotape at the Brigham Young University recording studio. Each singer recorded 20 minutes of sung lullabies (side A) and 20 minutes of spoken lullabies (side B).

Equipment

The SONY headphone unit, number NTM-1, and 3⅞ by 3⅜ by 2⅛ (wide) inch Radio Shack Amplified Minisystem Speakers, number 40-167 were used for the cassette recorder and speakers. The Ekstein Brothers Neometer was used as a general hearing tester. The Radio Shack Sound Analog Display Level Meter, number 33-2050 was used as a volume control unit. The SONY Video 8 Handycam CCD-TR91 was used for video recording.

Procedure

Research Design

The design was an Independent Groups model, consisting of a complex crossover design that employed randomly ordered multiple treatments (i.e., each baby received a different treatment every day during the 4-day period of intervention). The control group consisted of 33 premature infants who were closely matched to babies in the experimental group for gestational age, weight, and gender. Selected physiological and behavioral measures were collected on 4 successive days for each infant presented with one of 27 possible combinations of sung and spoken interventions for each of the 4 days. Physiological measures observed for infants in the experimental group included heart rate and oxygen saturation. Behavioral scores were assessed and calculated according to a chart of observable specific movements by the infants. Those in the experimental and control groups were then compared for weight changes (g) and caloric intake (kg) at birth and at discharge, weight gain and caloric intake during intervention, and overall length of time in the unit. Data were collected over a 5-month period from July to November, 1994.

Protocol

The station nurse briefed the investigator about daily procedures for each subject. The subject's feeding schedule was checked to fit intervention time. Heart rate and oxygenation equipment were checked. The subject's hearing was tested, using an Ekstein Brothers Neometer, for a minimum acceptance response of 3 out of 5 times. The response consisted of any kind of physical movement, including sudden or gradual eye, face, head, neck, or limb movements within a 5–10 second interval from the time the neometer was sounded. This was done on the first of the 4 days of intervention, and all subjects were accepted.

A 10-minute baseline of behavioral and physiological measures assessed the initial state of the infant before intervention. Measures included heart rate, oxygen saturation, and behavioral assessment. The camcorder was set up on a tripod, and the recorder and speakers were carefully placed in the back of the isolette, approximately 3 to 5 inches behind the baby's head. Speakers were checked by the Radio Shack Sound Analog Display Level Meter to maintain volume at 65–75 dB (decibels), a safe sound level for infants. Isolettes and physiological monitors were situated for the best videotaping. Video recordings included avoided excessive glare on the isolette and were close enough to pick up clear, detailed movements of the infants.

The first intervention began with 20 minutes of recorded lullabies sung or spoken by a female mezzo soprano voice or a male baritone voice; selection of one of the 27 possible configurations was random. Observations of behaviors and readings of equipment-monitored physiological functions by the investigator were assessed and recorded on the data collection observation sheet used in Intervention I.

Following the first intervention, a period of 20 minutes of no intervention followed, during which time observations of behaviors and readings of equipment-monitored physiological functions were assessed and recorded on the data collection observation sheet used in Intervention II. During this time the infant was exposed only to the usual noises of the NICU. During this segment, the minisystem speakers and SONY Walkman unit were quietly turned off and left inside the isolette.

Following the second 20-minute period, subjects listened to 20 more minutes of lullabies sung or spoken by a mezzo soprano or a baritone voice; choice of one of the 27 possible configurations was random. Observations of behaviors and readings of equipment-monitored physiological functions were assessed and recorded on the data collection observation sheet used in Intervention III.

Directly following the third intervention, recording equipment was turned off and put away, and the investigator either left the hospital or recorded another subject. On days 2, 3, and 4 of the protocol with each subject, the same procedure was followed without the hearing test. The initial baseline and three-period observations totalled 1 hour and 10 minutes.

Results

Experimental Group

Heart Rate

The interventions of singing and speaking by male and female voices affected the infants' heart rates as shown in Figure 1.

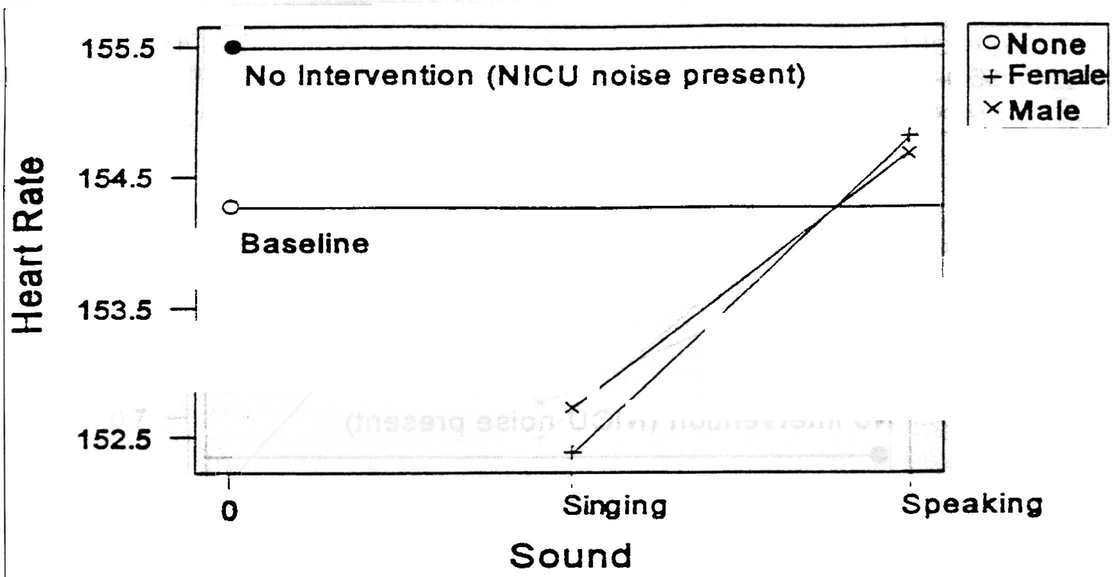
The following eight parameters were significant: baseline versus singing ($p < 0.0430$); no intervention (NICU noise present) versus singing ($p < 0.0002$); no intervention (NICU noise present) versus singing and speaking ($p < 0.0042$); singing versus speaking ($p < 0.0176$); no intervention (NICU noise present) versus female singing and speaking ($p < 0.0153$); no intervention (NICU noise present) versus male singing and speaking ($p < 0.0219$); no intervention (NICU noise present) versus female singing ($p < 0.0019$); no intervention (NICU noise present) versus male singing ($p < 0.0058$).

It appears, therefore, that the heart rates of the 33 infants were affected more significantly by singing than by speaking ($p < 0.0176$). It also seems to be the case that the infants did not distinguish between the male and female singing and speaking voices ($p < 0.9044$). In addition, the infants' heart rates were significantly affected when there was a change from baseline to singing, no intervention (NICU noise present) to singing, and no intervention (NICU noise present) to singing and speaking.

These data would support in part the rejection of the null hypothesis that there would be no difference in heart rate among the infants in the experimental group.

Oxygen Saturation

The interventions of singing and speaking by male and female voices affected the infants' oxygen saturation as shown in Figure 2 (page 8).



Source	NDF	DDF	F	Pr > F
base vs. singing		372	4.12	0.0430
n.i. vs. singing		372	14.27	0.0002
n.i. vs. singing and speaking		372	8.28	0.0042
singing vs. speaking		372	5.68	0.0176
female vs. male singing and speaking		372	0.01	0.9044
noise vs. female singing and speaking		372	5.94	0.0153
noise vs. male singing and speaking		372	5.30	0.0219
noise vs. female singing		372	9.76	0.0019
noise vs. male singing		372	7.69	0.0058

Figure 1. Heart Rate, Singing vs. Speaking/Male vs. Female

The following seven parameters were significant: no intervention (NICU noise present) versus singing ($p < 0.0005$); base versus no intervention (NICU noise present, $p < 0.0565$); no intervention (NICU noise present) versus singing and speaking, $p < 0.0163$); singing versus speaking ($p < 0.0078$); no intervention (NICU noise present) versus male singing and speaking ($p < 0.0148$); no intervention (NICU noise present) versus female singing ($p < 0.0167$); no intervention (NICU noise present) versus male singing ($p < 0.0026$).

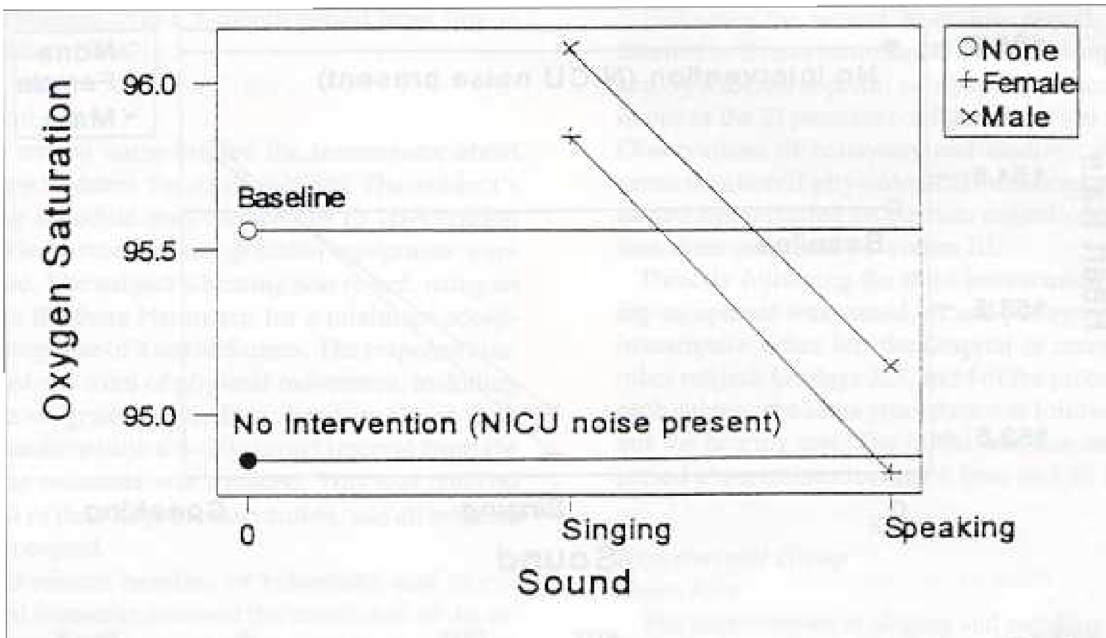
It appears, therefore, that (similar to heart rate) the oxygen saturation of 14 of the 33 infants was affected more significantly by singing than by speaking ($p < 0.0078$). It also seems to be the case that the infants did not distinguish between the male and female singing and speaking voices ($p < 0.4052$). In addition, the infants' oxygen saturation was significantly affected when there was a change from no intervention (NICU noise present) to singing, base to no intervention (NICU noise present), and no intervention (NICU noise present) to singing and speaking.

These data would support in part the rejection of the null hypothesis in that there would be no difference in oxygen saturation among the infants in the experimental group.

Behaviors

The interventions of singing and speaking by male and female voices affected the infants' behaviors as shown in Figure 3 (page 9).

The following 13 parameters were significant: baseline versus singing ($p < 0.0014$); no intervention (NICU noise present) versus singing ($p < 0.0001$); no intervention (NICU noise present) versus speaking ($p < 0.0007$); base versus no intervention (NICU noise present, $p < 0.0001$); no intervention (NICU noise present) versus singing and speaking, $p < 0.0001$);



Source	NDF	DDF	F	Pr > F
base vs. no intervention (n.i.)	1	157	3.69	0.0565
n.i. vs. singing	1	157	12.60	0.0005
n.i. vs. singing and speaking	1	157	5.90	0.0163
singing vs. speaking	1	157	7.27	0.0078
female vs. male singing and speaking	1	157	0.70	0.4052
noise vs. male singing and speaking	1	157	6.07	0.0148
noise vs. female singing	1	157	5.86	0.0167
noise vs. male singing	1	157	9.39	0.0026

Figure 2. Oxygen Saturation, Singing vs. Speaking/Male vs. Female

singing versus speaking ($p < 0.0001$); no intervention (NICU noise present) versus female singing and speaking, $p < 0.0001$); no intervention (NICU noise present) versus male singing and speaking ($p < 0.0001$); base versus female singing ($p < 0.0034$); no intervention (NICU noise present) versus female singing ($p < 0.0001$); base versus male singing ($p < 0.0236$); no intervention (NICU noise present) versus male singing ($p < 0.0001$); and no intervention (NICU noise present) versus male speaking ($p < 0.0005$).

It appears, therefore, that (as in the case of heart rate and oxygen saturation) the behaviors of the 33 infants were affected more significantly by singing than by speaking ($p < 0.0001$). It also seems to be the case that the infants did not distinguish between the male and female singing and speaking voices ($p < 0.5655$). In addition, the infants' behaviors were significantly affected when there was a change from baseline to singing, no intervention (NICU noise present) to singing, and no intervention (NICU noise present) to singing and speaking.

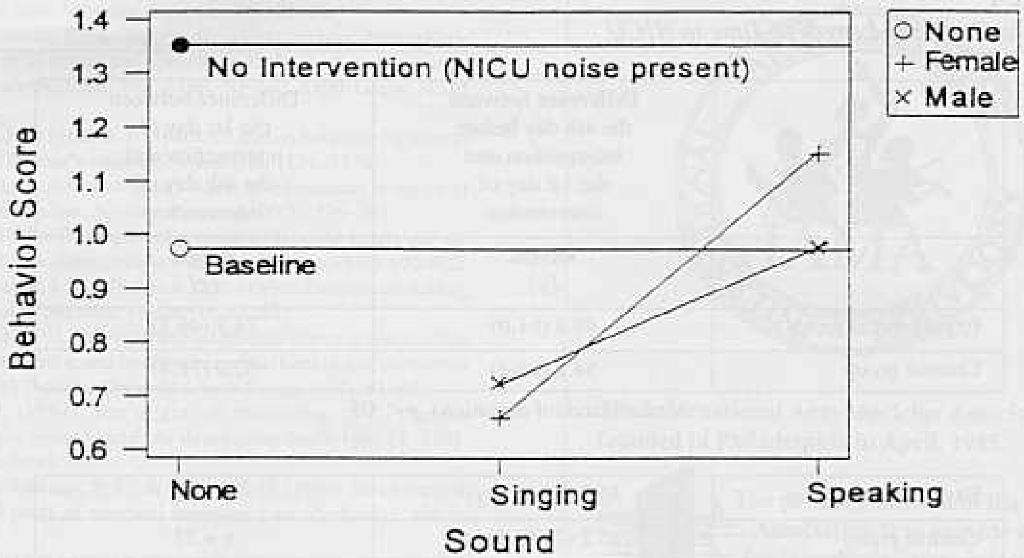
These data would support in part the rejection of the null hypothesis that there would be no difference in behaviors among the infants in the experimental group.

Data Analysis

A mixed models procedure was used to analyze the data for the experimental group in terms of heart rate, oxygen saturation, and behaviors. Adjustments were made for babies' effects, days' effects, and autocorrelation effects.

Experimental and Control Groups

Subjects in the experimental and control groups were compared on three measures: caloric intake, weight gain, and length of time in unit. Pre- and post-



Source	NDF	DDF	F	Pr > F
base vs. no intervention (n.i.)	1	371	16.97	0.0001
base vs. singing	1	371	10.43	0.0014
n.i. vs. singing	1	371	64.43	0.0001
n.i. vs. speaking	1	371	11.59	0.0007
n.i. vs. singing and speaking	1	371	47.15	0.0001
singing vs. speaking	1	371	15.99	0.0001
female vs. male singing and speaking	1	371	0.33	0.5655
noise vs. female singing and speaking	1	371	29.21	0.0001
noise vs. male singing and speaking	1	371	36.52	0.0001
base vs. female singing	1	371	8.67	0.0034
noise vs. female singing	1	371	44.47	0.0001
base vs. male singing	1	371	5.17	0.0236
noise vs. male singing	1	371	36.01	0.0001
noise vs. male speaking	1	371	12.19	0.0005

Figure 3: Behaviors, Singing vs. Speaking/Male vs. Female

intervention measures of caloric intake and weight show significant differences between subjects in the experimental and control groups ($p < .05$). (See Table 1, page 10.)

Subjects in the experimental group had significantly greater caloric intake and weight gain, and stayed in the unit an average of nearly 3 days less than subjects in the control group ($p < .05$).

Discussion

Heart Rate and Oxygen Saturation

Heart rates were lowered by both male and female singing, which may also have had a benefit on the central nervous system (Porges, 1983). The oxygen saturation results paralleled those of the heart rate. This positive effect may also help prevent chronic lung disease (Als et al., 1986), and have a general positive influence on oxygen saturation (see Long, Lucey, & Philip, 1980).

Behaviors

Results indicate that during the singing, behavior scores significantly moved toward the optimal restful state of the infant, consisting of little or no movement (see Figure 3). The results of this study challenge DeCasper and Fifer's (1980) statement that "...newborns prefer their mother's voices" and are, in fact, the most responsive to the female voice

Table 1
Weight Gain and Length of Time in NICU

	Difference between the 4th day before intervention and the 1st day of intervention	Difference between the 1st day of intervention and the 4th day of intervention
	Weight *[g]*	Weight *[g]*
Experimental group	49.4 (61.0)	78.3 (46.2)
Control group	54.2 (86.4)	62.0 (76.4)

Mean (standard deviation), $p < .05$

Experimental group	35.7 (21.3) days	$n = 33$
Control group	38.2 (24.0) days	$n = 33$

Mean (standard deviation), $p < .05$

(p. 1174) and support results reported in the Collins and Kuck (1991) study stating that "both oxygen saturation and behavioral state [of premature infants] improved significantly during the intervention period [female singing]" (p. 25). The results of the present study also support those of Caine (1989).

Caloric Intake, Weight Gain, and Length of Time in NICU

Positive results concerning caloric intake, weight gain, and time in unit are important because these factors prevent infants from leaving the hospital NICU (White-Traut; Collins & Kuck; Caine, 1989). At a time when hospital care and costs are being reviewed by healthcare professionals, it is important that musical interventions be seriously considered for reducing the significant expenses of the NICU (Ladden; Als et al.).

Conclusions

The following conclusions are drawn from the results of this study: Premature infants appear to respond more positively to singing than speaking as a means of reducing stressful behaviors and improving physiological measures, such as heart rate and oxygen saturation. Premature infants may respond equally to male and female voices, encouraging more investigation of this phenomenon throughout early childhood. NICU noises may produce more interruptions in the restful state of premature infants, thereby suggesting more caution among healthcare professionals in reducing environmental noise and sound levels. Premature infants may respond well to appropriate sound stimulation in terms of greater caloric intake and weight gain. Infants who have the intervention closest to their birth date may show the greatest weight gain compared to other infants who either experience the intervention farther from the birth date or not at all. Length of time in an NICU may be significantly shortened when premature infants experience appropriate sound interventions, most notably singing.

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A STUDY OF BRAIN ELECTRICAL RESPONSES TO MUSIC USING QUANTITATIVE ELECTROENCEPHALOGRAPHY (QEEG)

Bruce Barber, Stephen McKenzie, and Robert Helme

This study examines neurological responses to music. Differences in QEEG were analyzed between: music stimulus conditions and resting state, musically trained and nonmusically trained subjects, and responses to different styles of music. The EEG data were collected from all subjects (a) while they were sitting quietly; and (b) while they were listening to two separate musical excerpts of contrasting styles. Results demonstrate individual subject variability, changes in response to the experimental conditions across all frequency bandwidths and limited differences in response to the contrasting styles. When QEEG variables were used, the two groups of subjects were clearly differentiated in a Discriminant Function Analysis. It was concluded that QEEG has the potential to elucidate neurological responses to music. This study encourages further research but suggests the need for changes in experimental design.

Introduction

Quantitative electroencephalography (QEEG) is an inexpensive and noninvasive method of measuring brain electrical activity from the scalp of human subjects. It has established a role in the detection and evaluation of a wide range of neurological conditions such as epilepsy and brain trauma (John & Prichep, 1993). It has also been used extensively as a research tool in the study of issues such as aging and dementia (Marciani, Maschio, Spanneda, Caltagirone, Gigli, & Bernardi, 1994; Prinz & Vitiello, 1989).

QEEG has excellent temporal resolution and this, perhaps more than any other property, has directed QEEG research toward the exploration of a range of normal cognitive processes including those involved in music (Petsche, Lindner, & Rappelsberger, 1988). Our research, using QEEG methods to study neurological processes associated with music, has been undertaken with a view to gathering objective information that may provide a basis for the review of the theories and practices in the education of musicians. Furthermore, such information also has the potential for application in a variety of disciplines, including music therapy, and as an auxiliary tool in the diagnosis of disorders such as dementia.

While little is known about the cognitive correlates of the conventional frequency bandwidths used in QEEG, our pilot study (Barber, McKenzie, & Helme, 1995) encouraged us to further investigate musical processes using this method. This study demonstrated:

1. QEEG differences between resting state and music stimulus conditions.
2. QEEG differences in the responses of musicians and nonmusicians.
3. within-test and retest reliability.

The experiment reported here is one of three experiments whose preliminary analysis is reported elsewhere (Barber, McKenzie, & Helme, 1996). Each of these experiments used qualitatively different musical stimuli in an attempt to go some way towards addressing one of the key issues in the design of such experiments, namely, the nature of the experimental musical stimuli. Music may be reduced, to a greater or lesser extent, to component elements such as melody or rhythm, with a view to determining whether there is a detectable topography specific to those separated elements. Alternatively, the use of real music—music as it is listened to in a given sociocultural context—may reveal more about patterns of neurological function. This experiment applied the latter type of musical stimuli.

The experiment aimed to further investigate:

1. changes in response between resting states and music stimulus conditions.
2. differences in the responses of musicians and nonmusicians to musical stimuli.
3. QEEG changes, if any, in response to music of different styles.

Subjects

Twenty-one musicians were recruited from the University of Melbourne or through associated contacts. All had studied music at tertiary level for at least 3 years, or were actively engaged in a music performance career. All were proficient players of at least one instrument.

Twenty-five nonmusicians were recruited from staff at The National Ageing Research Institute (NARI) or the affiliated North West Hospital. Most had no musical training, some had learned an instrument at early secondary school level (maximum 2 years) but had not played for at least 5 years. None was engaged in any form of music making.

Exclusion criteria for subjects included left-handedness, use of drugs known to affect the EEG, and any history of neurological disorder or brain trauma.

Data from four subjects were excluded prior to initial analysis as a result of procedural problems during recording. After visual and statistical rejection of artefact-contaminated data, 15 musicians (mean age 22.4 Ò 3.02 years; 9 male, 6 female) and 14 nonmusicians (mean age 25.5 Ò 6.25 years; 8 male 6 female) were selected for further statistical analysis.

Equipment

Data were recorded at NARI using a Grass 23-channel EEG machine linked to an IBM compatible PC. Stellate Rhythm software was used to display the EEG data for epoch selection and to perform the Fourier Transform. Electrode caps with 19 scalp electrodes referenced to linked ear electrodes were located according to the International Standard 10/20 System. (Fig. 1).

Experimental Conditions

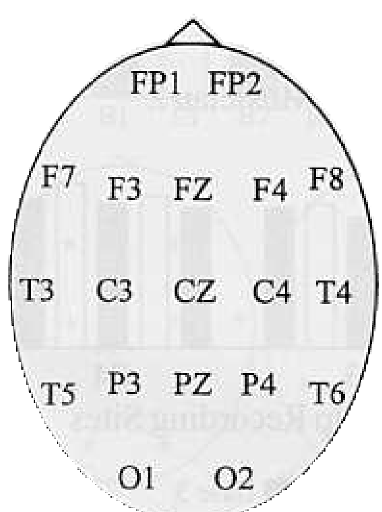
There were five experimental conditions

1. Baseline 1 (B1)
2. Classical music (Cl)
3. Baseline 2 (B2)
4. Rock music (Ro)
5. Baseline 3 (B3)

During baseline, subjects were seated in a comfortable chair and asked to remain quiet, still, and relaxed with eyes closed. They were instructed to observe passing thoughts rather than attaching to, and pursuing a particular idea. After each of the two music conditions, subjects were asked to put the music out of their minds.

The classical excerpt was taken from the second movement of *Double Violin Concerto in D minor* by J. S. Bach. While this work is more correctly referred to as baroque, the word classical is used to avoid possible confusion in verbal reporting. The rock excerpt was taken from the song *Won't Get You Loved*, by Nick Barker and the Reptiles, an Australian group.

Instructions to subjects and the stimulus conditions were prerecorded in a professional recording studio, transferred to audiocassette and played on a Panasonic RX-DT680 sound system placed directly in front of the subjects at a distance of approximately 2.5 meters. Volume and tone settings were consistent for all subjects. Lighting was consistent for all subjects and room temperature was maintained within a comfortable range. Each condition lasted for 1½ minutes during which 1 minute of EEG data was recorded. The conditions were presented in the same order for all subjects.



Frontal	FP1 FP2 F7 F3 F4 F8
Parietal	C3 C4 P3 P4
Occipital	O1 O2
Temporal	T3 T4 T5 T6
Midline	FZ CZ PZ

Figure 1. Location and nomenclature of the 19 scalp electrodes

Analysis

1. The Fourier Transform defined the following bandwidths:

Delta (0.75–3.75 Hz)	Theta (4.00–7.75 Hz)	Alpha (8.00–12.75 Hz)
Beta 1 (13.00–17.75 Hz)	Beta 2 (18.00–24.75 Hz)	Beta 3 (25.00–31.00 Hz)

Each bandwidth has the three primary measures: absolute power, relative power, and mean frequency. The results presented in this report are derived from the relative power measure that shows activity in a bandwidth as a percentage of activity in all bandwidths.

2. Descriptive statistics were used to show: (a) means and standard deviations across all sites, bandwidths and conditions; and (b) percentage differences between stimulus conditions.

3. MANOVA was applied using the factors: Group, Scalp Recording Site, and Stimulus Condition.

4. T-tests were used to determine specific sites of the significant MANOVA changes.

5. Discriminant Function Analysis was applied to determine whether QEEG variables allowed classification of musicians and nonmusicians.

Results

Variations in the Response Patterns of Individual Subjects

Before presentation of the results of statistical analysis of group data, some observations regarding the variability of individual responses will be made. Examination of individual subject data revealed some strikingly different patterns of response. The graphs (Fig. 2) show changes in two musicians in theta activation at two electrode sites across the five experimental conditions. The subjects are quite similar in profile, being the same age, gender, year level in a tertiary music degree, and sharing similar performance capabilities. Musician 1 shows a marked reduction in theta activation during the music conditions. Musician 2 shows an opposite, though less robust, *increase* in the same measure. In both cases the patterns of change represented at electrode sites C3 and C4 (parietal) were repeated in approximately 75% of scalp sites. This is presented as a typical example of variability between subjects rather than an extreme example.

The evident variability of responses across individual subjects, taken together with evidence that individual responses appear to be reasonably consistent over time (Barber et al., 1995), must be considered as a confounding factor in the consideration of group data. The frequently robust changes in individual responses to different experimental conditions, seem to be disguised when grouped.

MANOVA

The Group factor showed a main effect in the delta bandwidth $p = .020$. The alpha and beta 3 bandwidths trended towards significant group main effects falling just outside $p < .05$.

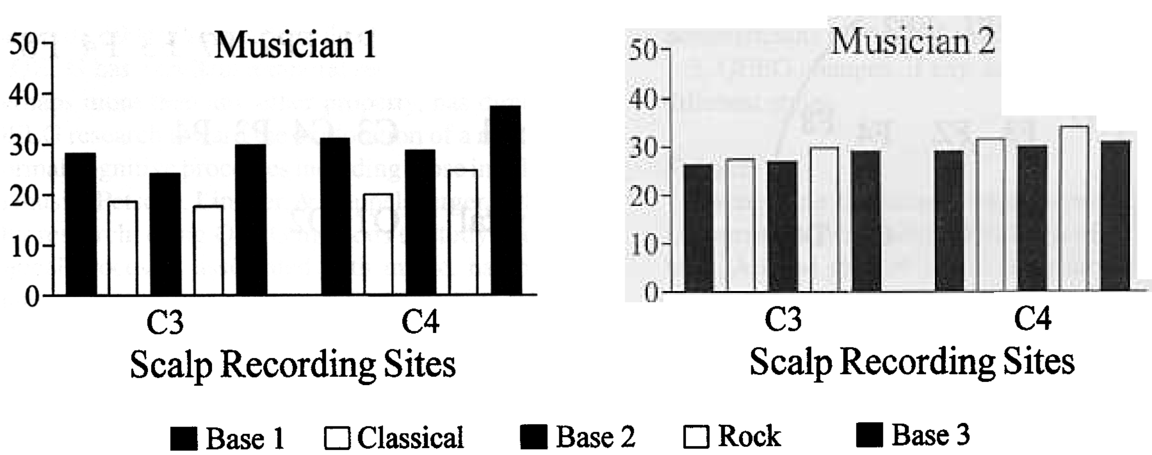


Figure 2. Individual patterns of theta band response across the five experimental conditions of two musicians. The variability between the two subjects shown here is typical of all subjects in this study.

The Site factor showed main effects in all bandwidths ($p = .000$).

There was no Condition main effect.

Group-Site interaction effects were observed in the theta ($p = .019$) and alpha ($p = .004$) bandwidths.

Condition-Site interaction effects were observed in all bandwidths ($p = .000$).

A three-way Group-Condition-Site interaction was observed in delta, theta, and alpha bandwidths ($p = .000$), beta 2 ($p = .020$), and beta 3 ($p = .044$).

The nature of the significant effects is described below.

Differences Between Baseline and Music Conditions

The following graphs and diagrams show the differences in brain electrical activation between the music and baseline conditions in all 6 bandwidths. The two groups, musicians and nonmusicians, are displayed in parallel.

The bars in the graphs show the mean and standard deviation for all 19 scalp electrodes combined for each of the five conditions. They are included to contextualize the nature of the statistically significant changes at individual electrode sites within overall changes across the scalp.

The diagrams are representations of the skull facing toward the top of the page and viewed from above.

Note: * indicates $p < 0.5$
** indicates $p < 0.01$
+ indicates reversible changes $p < 0.5$
++ indicates reversible changes $p < 0.01$

Delta

The graphs (Fig. 3.1) indicate a reversible pattern occurring in both groups. Delta activation increased during the two music conditions. The accompanying diagrams show the sites at which the music conditions are significantly distinguished from the pre- and/or post-baseline conditions. The crosses show the sites at which the music condition was significantly distinguished from both the pre- and post-baseline conditions indicating a relatively robust reversibility.

During the classical music excerpt musicians showed a generalized, bilateral response, with more restricted changes evident during the rock music excerpt. Nonmusicians showed a more limited response although the changes that do occur tend to replicate changes in the musicians.

Theta

The graph for musicians (Fig. 3.2) indicates an overall reversible decrease in theta activation during both music conditions. The changes are strongly in-

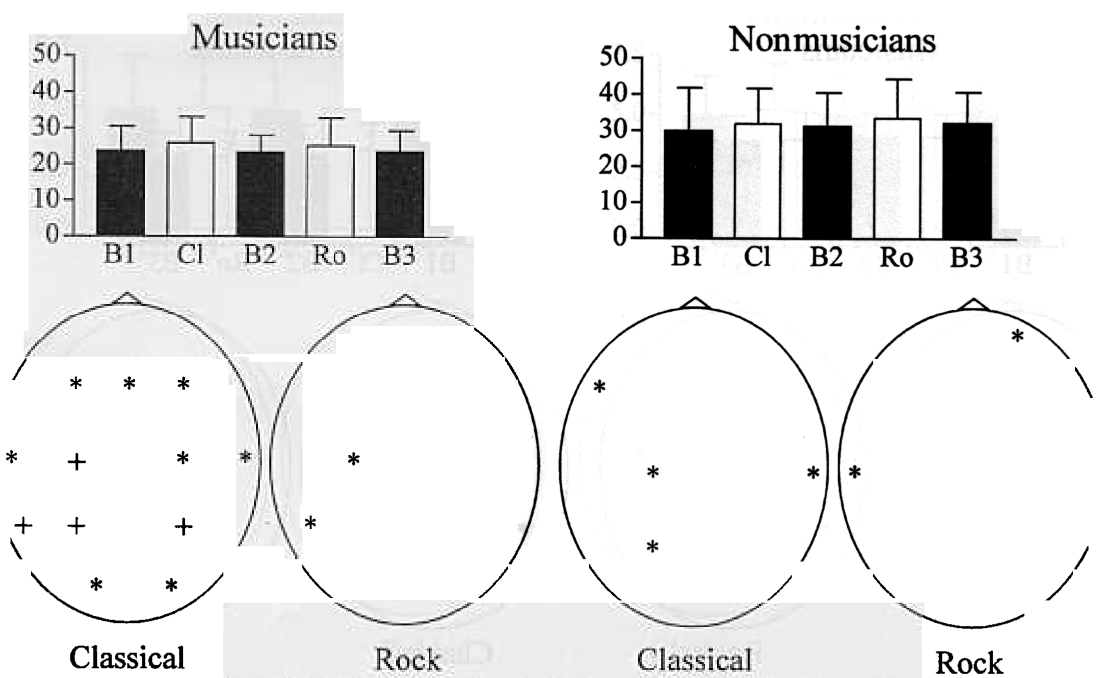


Figure 3.1. Differences in delta activation between baseline and music conditions

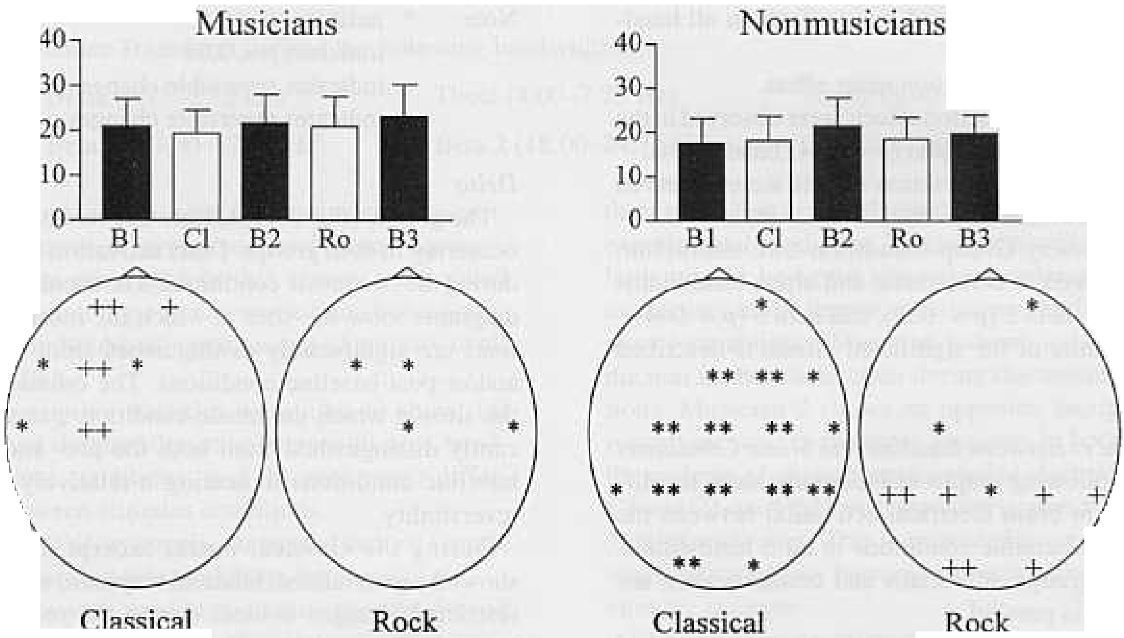


Figure 3.2. Differences in theta activation between baseline and music conditions

dicated in the left frontal region during classical music and tend more to the central and frontal regions during rock music.

With nonmusicians classical music is strongly distinguished. Examination of the graph shows that activation during this music excerpt is higher than in baseline 1 but lower than in baseline 2. The significant changes occur between the music condition and baseline two. Theta activation increases over the first three conditions before an overall reversible response is demonstrated between baseline 2, rock music, and baseline 3. Reduced theta during rock

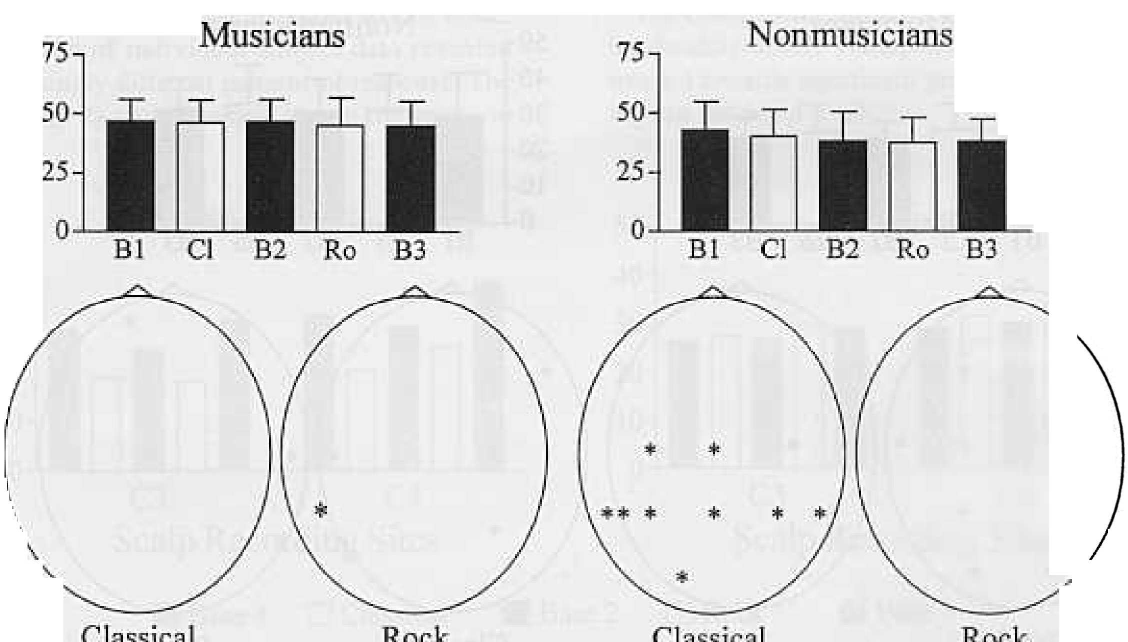


Figure 3.3. Differences in alpha activation between baseline and music conditions

music is reversible and strongly indicated in the temporoparietal and occipital regions.

Alpha

The alpha band was largely unaffected by the music conditions in either group. The significant changes in the classical music condition for the nonmusician group derive from the reduction of alpha activity, which occurs after the first baseline. That the subsequent, second baseline shows a further reduction in alpha confounds interpretation.

Beta 1

The significant changes in both groups derive from an increase in beta 1 activation during music conditions. The fact that the graphs suggest very little change across conditions indicates that increased activation was more focal than generalized, especially among the musicians. With nonmusicians, the graphs indicate an overall reversible increase during music conditions, though this pattern does not achieve significance.

Beta 2

In both groups, beta 2 activation decreases across the first three conditions, then shows a reversible increase during the rock music excerpt. The changes during rock music are more focal with the musicians than the nonmusicians. In both groups the changes are bilateral.

Beta 3

The significant changes in beta 3 activity during the music conditions result from *increased* activation despite the contrary indication in the graphs for both groups in the first three conditions. The changes are stronger among the musicians, quite focal and predominantly located in the left hemisphere.

Differences in Response to Contrasting Musical Styles

The graphs combine all 19 electrode sites for the five experimental conditions and are used to highlight the significant differences between the two music conditions within the context of overall differences across the scalp. The diagrams show sites at which significant differences between the two music conditions were observed. Responses to the two musical styles were differentiated among musicians in the theta and beta 3 bands. In both cases, activation was higher during the rock excerpt, and the changes occurred predominantly in the left hemisphere.

With nonmusicians, the alpha band showed lower activation during rock music than classical music.

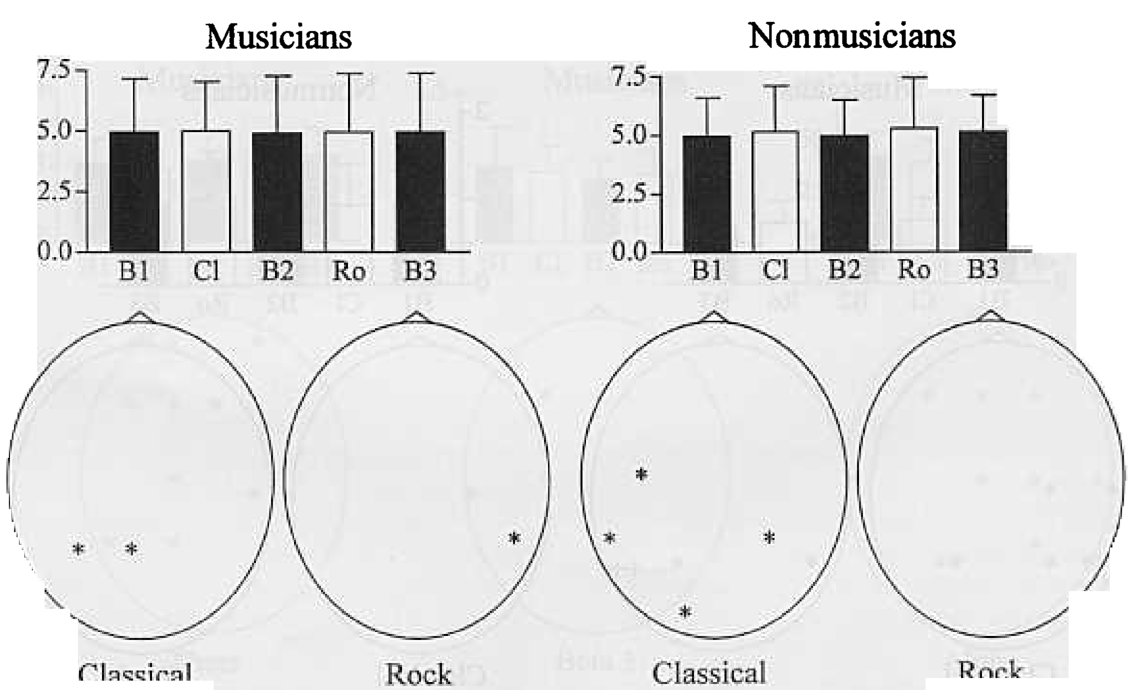
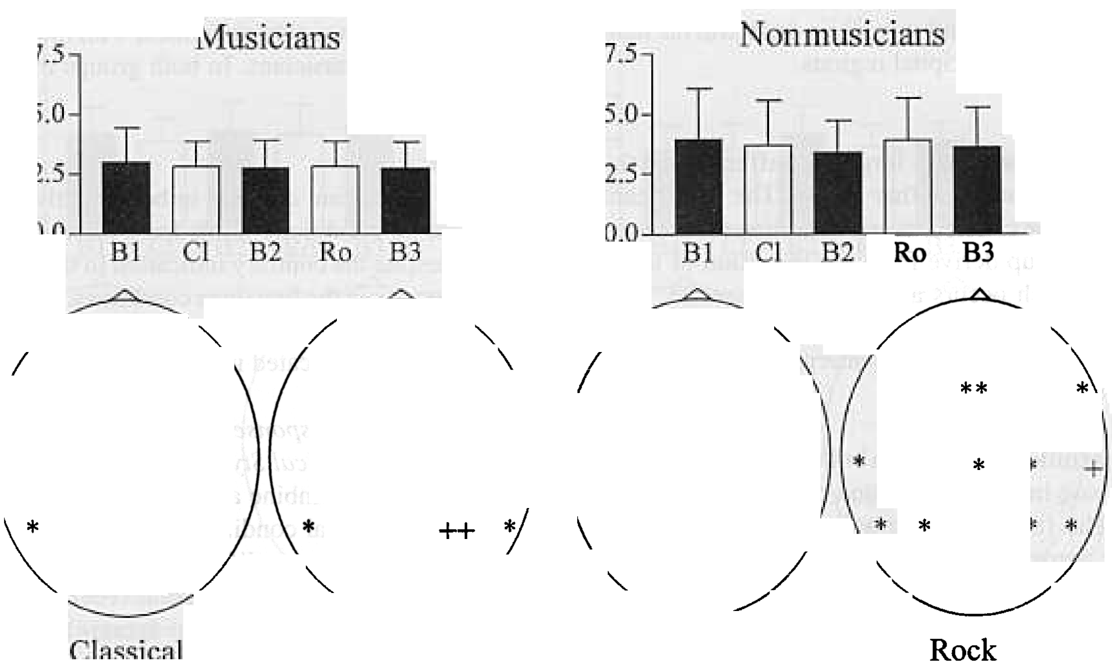


Figure 3.4. Differences in beta 1 activation between baseline and music conditions



The changes occurred predominantly in the right hemisphere in frontal, midline, and temporoparietal regions.

A factor that gives rise to caution in interpreting these results is that the differences between the two conditions occurred in the context of trends across the five conditions. For example, the lower alpha activation for nonmusicians during rock music coincides with and appears to be consistent with a decrease of 11% in alpha activation across all five con-

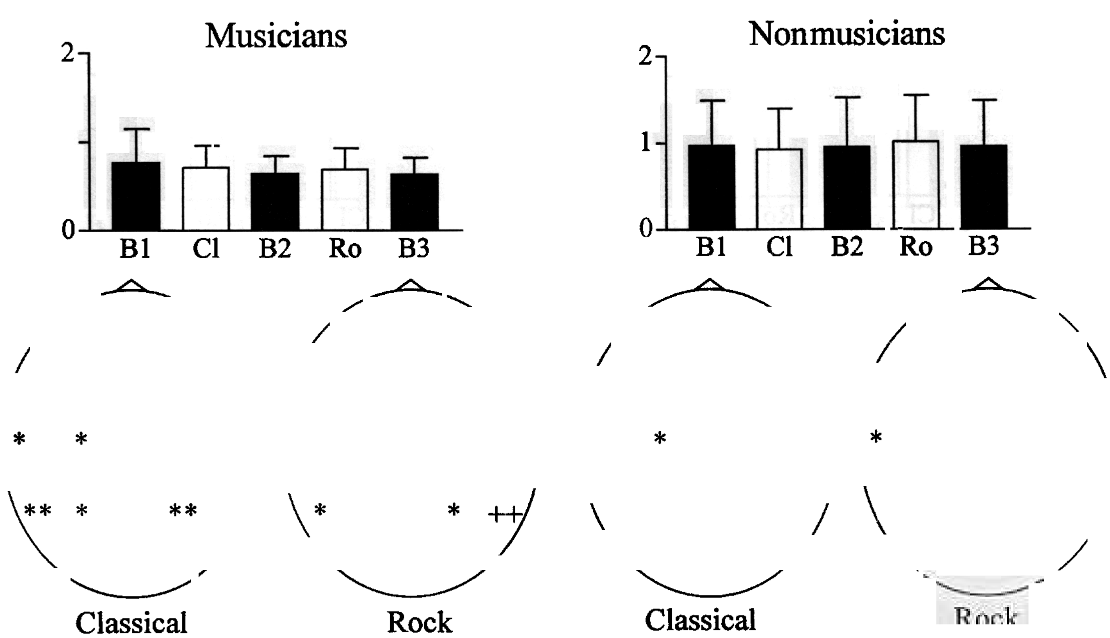


Figure 3.6. Differences in beta 3 activation between baseline and music conditions

ditions. However, with the musicians, the music conditions do appear to show responses that are independent of the baseline trends.

Discriminant Function Analysis

MANOVA demonstrated quite limited differences between the two groups. However, the evident variation in the responses of the two groups encouraged the use of Discriminant Function Analysis (DFA) to determine whether QEEG variables could classify the groups, and if so, which variables best served this function. The DFA was based on the six best site variables for each condition and each bandwidth as determined by preliminary Spearman Correlations. The six variables shown in Fig. 5 detail the strongest DFA differentiation of the two groups.

Discussion

An experimental design that contrasts brain electrical activation during a resting state with activation in response to music is attractive for a number of reasons. It is simple to administer and it avoids placing the participating subjects in an environment that is too remote from their experience of music. Music is culturally embedded and acquired, a robust, arousing, and affective medium. It is therefore reasonable, if naive, to anticipate responses that reflect those qualities and reveal themselves unequivocally. However, a number of issues have emerged in this study that indicate such a simple design will not allow more than general interpretations to be made. Its minimalist approach may serve more to inform future experimental design rather than provide definitive data on which to build a theory of neurological processing of music.

The variability of responses found among subjects supports the idea that music cognition is moderated by many factors, some of which may be unique to the individual. Intersubject variability of the EEG has been examined in some detail by other researchers (Kohrman, Sugioka, Huttenlocher, & Spire, 1989) and is by no means an issue unique to the study of music processes. The music conditions in this study required only that the subjects listen to the music. In the absence of any stimulus-related task, we were unable to monitor the degree of attention exercised by subjects. Sergent (1993) made a number of recommendations regarding experimental design, including the use of a homogeneous group of musically trained subjects to facilitate the application of tasks which would at least serve to verify attention.

Differences between brain electrical activation in the resting state and music conditions have been

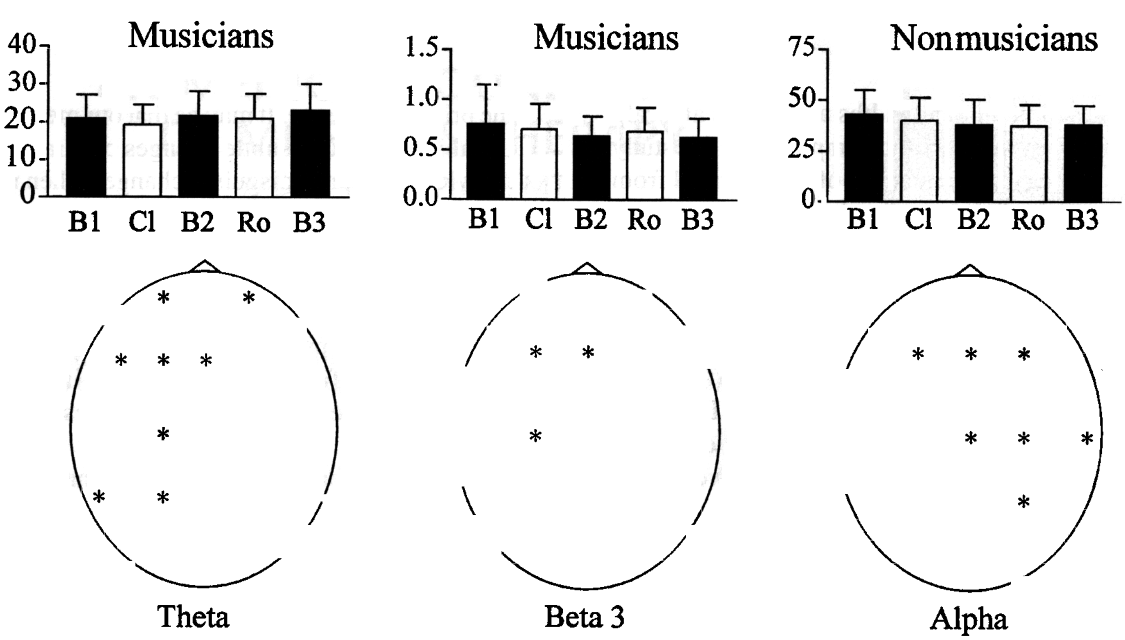


Figure 4. Differences in response to contrasted musical styles. Note: * indicates $p < 0.05$)

Delta Baseline 3

	1	2
	15	3
2	0	11

K.79137
90%

FP1 F3 FZ T6 O1 O2

Theta Classical

	1	2
	12	1
2	3	13

K .72512
86%

FZ C4 T4 P3 PZ P4

Alpha Classical

	1	2
1	13	2
2	2	12

K .72381
86%

FP1 FP2 FZ T5 T6 O1

Alpha Rock

	1	2
	14	1
2	1	13

K .86190
93%

FP1 FP2 F7 F8 T6 PZ

Alpha Baseline 2

	1	2
	15	2
2	0	12

K .86124
93%

FP1 FP2 T5 T6 O1 O2

Beta 2 Rock

	1	2
1	14	4
2	1	10

K .65228
83%

FP1 F3 FZ F4 F8 CZ

Figure 5. Discriminant Function Analysis. 1 = Musicians, 2 = Nonmusicians. The number of correctly classified musicians is shown in the upper left cell of each table: the number of correctly classified nonmusicians is shown in the lower right cells. The percentage of correctly classified subjects is included along with the kappa. The site variables are shown below each table.

demonstrated in all bandwidths and across all scalp regions. However, the method employed in this study generates a very large quantity of data derived from a large number of variables, and consequently it generates an abundance of results that are difficult to interpret. For example, the changes observed in the different bandwidths may reflect the multidimensional nature of music and lead to speculation that activity in different bandwidths reflects different aspects of musical reception and cognition. In the absence of anything more than generalized cognitive correlates of the various bandwidths, however, we are unable to sustain such speculation.

The limited changes in response to the strikingly contrasted musical styles are a little perplexing. Petsche, Richter, Von Stein, Etlinger, & Filz (1993) have convincingly demonstrated such changes in individual subjects using changes in coherence as the primary measure. It may be that our method lacks the ability to detect subtle changes or it may be that individual variance disguises changes when the data are grouped.

Discriminant Function Analysis was able to classify the two groups quite clearly using QEEG variables. These results have yet to be replicated and therefore have a provisional status. We do, however, have some confidence that expertise in music has QEEG correlates that differentiate musicians from nonmusicians.

The results from this study suggest that QEEG has the potential to elucidate neurological processes involved in musical thinking. Our future research will concentrate on design issues with a view to verifying subject attention to stimulus conditions and implementing procedures that assist in the interpretation of individual variance.

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MUSIC LISTENING AND S-IgA LEVELS IN PATIENTS UNDERGOING A DENTAL PROCEDURE

Louis Clifford Goff, Rosalie Rebollo Pratt, and J. L. Madrigal

Eighty patients undergoing a crown preparation procedure were randomly assigned to one of eight cells, four female and four male groups, respectively. One of the four treatments was applied to each set of four male and four female groups, and pre- and posttest saliva samples for S-IgA were compared. Results showed that music listening during the procedure had a significant positive effect on the S-IgA levels of female patients ($p = 0.0133$)*. Music listening, with or without nitrous oxide, may significantly lower levels of anxiety and stress of females during such procedures.*

Introduction

The healing effects of music were formally identified in the biblical account of David playing his harp to relieve the depressions of King Saul (I Samuel 16:16–23). Pratt explains that medical practice in the ancient Greek tradition clearly acknowledged the medicinal aspect of music since Apollo was god of both medicine and music. Physicians such as Galen made reference to the importance of music education in the training program of future doctors (Pratt, 1985). Following the Enlightenment, when specialization of knowledge was emphasized, physicians began to distance themselves from formally acknowledging the healing powers of music. Thus, the close association between physicians and musicians began to disintegrate. It was not until World War II and the resulting overcrowded hospital conditions that the field of music therapy was recognized and established as its own discipline. Once again, music and medicine were reunited (Pratt, 1985).

For those in dentistry to understand how music can help ameliorate pain and anxiety, it is necessary to comprehend the effects of psychoneuroimmunology as it relates to the nervous and immune systems. If music is indeed a legitimate and viable therapy, there must be a scientific means whereby results of music therapy can be demonstrated and verified. Such results can now be manifested through the use of radial immunodiffusion by measuring the antibody known as Secretory Immunoglobulin A. Scientific, medical, and MusicMedicine studies since the early 1980s have demonstrated that a reliable characteristic of a person's immunocompetence or stress status can be established by researching the activity of the immunoglobulin family of antibodies. Secretory Immunoglobulin A is a member of the family of immunoglobulins and can be representative as a marker on patients undergoing a stressful dental operation.

Music Therapy: There is an abundance of research showing the effectiveness of music in relieving pain and anxiety in medical settings. In dentistry, Cherry and Pallin (1948) found that music was used for therapeutic reasons in dental procedures as early as 1948. For the next 40 years, a few examples of the advantageous use of music in dentistry were chronicled (Jacobsen, 1957; Long & Johnson, 1978; Standley, 1986; Atterbury, 1974; Weisbrod, 1969). Notwithstanding, during the past 8 years there is relatively little solid documentation covering the area of the influence of music on patient stress and pain during dental procedures; a fact that indicates the need for objective research in this area.

S-IgA: In reviewing the family of immunoglobulins, it is found that all immunoglobulins are "...structurally related glycoproteins that operate as antibodies cell antigen receptors" (Taylor, 1985). The categorization of the five immunoglobulins into IgM, IgG, IgA, IgD, and IgE is based on their structure, and biologic activity (Taylor, 1985; Dillin, Minchoff, & Baker, 1986). The polymeric form of IgA is identified to be specific because of an additional polypeptide called the J-chain. Secretory IgA is a dimer amplified by an additional structure called the secretory component. Dorland (1985) defines S-IgA as the paramount immunoglobulin in not only oral, urogenital, intestinal mucus, and bronchial secretions, but also in tears, saliva, and milk.

The literature is replete with studies of IgA and how various diseases and situations affect it (Arranz, O'Mahony, Barton, & Ferguson, 1992; South, Cooper, Wolheim, & Good, 1968). Five groups of investigators (Kugler, Mess, & Haake, 1992; Jemmott & McClelland, 1989; Olness, Culbert, & Uden, 1989; Stone & Cox, 1987a; Stone & Cox, 1987b) pertinent to our discussion have conducted studies from which they have concluded that S-IgA can be directly influenced by positive or negative thinking and behavior patterns, and thus the levels of immunoglobulins can be a function of a person's mood. However, there are also researchers (Henningsen et al., 1992; Weisbrod, 1969) who state that the assaying of S-IgA to measure stress may not be as useful in psychophysiological research as expected. Notwithstanding, Jemmott and McClelland (1989) contradict Stone et al. (1987) by determining that there is no empirical or logical reason to reject the measurement of S-IgA over any length of time in lieu of performing some other measure of immune competence.

Background of Study

Dentists have been involved in the study of music and nitrous oxide/oxygen since c. 1948 (Bailey, 1992). Through visual observation and comments of patients, along with tests and questionnaires, dentists have concluded that music, either alone or as a supplement to nitrous oxide/oxygen analgesia, is both desirable and beneficial. Because of the advancement of radial immunodiffusion techniques, and an improved understanding of S-IgA, it should be possible to scientifically test the effect of music on a patient's stress level. It should be noted that there are conflicting opinions (Stone et al., 1987; Sato et al., 1987) as to whether a change in the levels of S-IgA can be manifested within the period of time that it takes a dentist to prepare a tooth for a crown, as was used in this research.

Precise information concerning the positive effects of music as an audioanalgesic might persuade more dentists to utilize music as an adjunct to their regimen. Further, regular use of music to accompany dental procedures might reduce a patient's fear and anxiety substantially.

Method

The patients selected for this study, all of whom were patients of the senior author and seen in his private practice in Ogden, Utah, were females and males between the ages of 18 and 65 years. Females who indicated they were either pregnant or might be pregnant were not included. The 80 selected subjects agreed to random assignment in one of eight categories: (a & b) Male and Female, local anesthetic only, (c & d) Male and Female, local anesthetic plus music, (e & f) Male and Female, local anesthetic plus nitrous oxide/oxygen, and (g & h) Male and Female, local anesthetic plus music, plus nitrous oxide/oxygen. All volunteers received the same dental treatment; that is, the preparation of a tooth for the manufacture and subsequent cementing of a crown.

The patients assigned to a music group were offered five different styles or types of musical interest including classical, Broadway hits, new age, country western, and light contemporary hits. Since some researchers (Stratton & Zalanowski, 1984) have indicated that one of the more germane elements of music therapy is for the patients to listen to music that is most pleasing to them, the patients were invited to bring their favorite music to the dental office for listening during the dental procedure.

There are differences in sensitivity and accommodation of the hearing mechanism of each patient. These differences were addressed by placing headphones on the patients and adjusting the volume according to the comfort of the individual.

After they had been seated and properly prepared for the dental experience, 5 microliters of saliva were extracted from all patients with a Samco Transfer Pipette. It should be noted that Aufricht, Tenner, Salzer, Khoss, Wurst, and Herkner (1992) concluded that when the three commonly used methods of saliva collection (spitting, suction, and salivette) were compared, the amount of S-IgA concentrations were shown to be lower in the salivette method than in the other two. Spitting and suction were discounted in this study because of the possibility of mixing unwanted serum IgA present in the blood in the second sample as a consequence of having had the tooth prepared subgingivally. Subsequently it was determined that a gentle massaging of the parotid gland would produce sufficient saliva for this study. After the use of the pipette, the saliva was transferred to a Fisher Brand Microcentrifuge Tube. The second saliva sample was taken postoperatively. The two saliva samples were then frozen before being taken to the Clinical Laboratory at Weber State University, Ogden, Utah for radial immunodiffusion analysis of S-IgA.

The examination of the data involved two investigated treatments: music and nitrous oxide. Both treatments contained two levels: (a) level 1 = the absence of music vs. level 2 = the presence of music, and (b) level 1 = the absence of nitrous oxide vs. level 2 = the presence of nitrous oxide. The objective was to look for differences between the means of each of the treatment levels. This objective was to ascertain if there were any significant differences in the levels of S-IgA in both treatment modes. Two of the purposes of this experiment were (a) to provide estimates of differences among treatment effects, and (b) to provide a simple way of confirming or denying hypotheses about the response to treatments. The procedure used to examine the data in this experiment was an analysis of variance (ANOVA).

Results

A significance level of 0.05 was used in all the tests performed to investigate music and/or nitrous oxide's effects. It is important to mention that if the p-value is smaller than the significance level for a given factor, this means that such a factor plays a critical role in explaining the behavior of the response.

Analysis of the effect of music and/or nitrous oxide using the concentration of S-IgA in the first saliva sample as the response variable indicated no significant effect. Based on this result, it was decided to use as the response variable the difference between concentrations of the preoperative and postoperative samples of S-IgA containing saliva.

A second analysis was conducted to investigate the influence of patient's age on the response. Results of this analysis showed that age is not an important factor in explaining the behavior of the patients, as regard to reducing stress level.

Table 1
Analysis of Variance for Female Anxiety Model

Source	*DF*	*SS*	*MS*	*F*	*P*-value
Music	1	231.5534	231.5534	6.78	[illegible]
Nitox	1	99.7296	99.7296	2.92	
Music & Nitox	1	7.6038	7.6038	0.22	
Error	36	1229.7606	34.1600		

Table 2
Analysis of Variance for Male Anxiety Model

Source	*DF*	*SS*	*MS*	*F*	*P*-value
		20.0931	20.0931	0.42	0.5222
		45.3903	45.3903	0.94	0.3378
		0.0801	0.0801	0.00	0.9677
	36	1731.4916	48.0969		

The model for each of these analyses is:

$Yiik = \# + Mj + Nj + MNj + e(ij)k$ where: $Yiik$ = the measurement taken on each subject; g = the overall mean; M = the treatment level for music; $i = 1$ (no music) or 2 (music); Nj = the treatment level for nitrous oxide; $j = 1$ (no nitrous oxide) or 2 (nitrous oxide); $MNij$ = the interaction of music and nitrous oxide; $e(ij)k$ = the measurement error; $k = 1, 2, \ldots, 10$ variable. When this happens, it is concluded that such a factor is significant.

From Table 1, it is possible to conclude that the level of stress in female patients is significantly reduced ($p = 0.011\,3$) by listening to music. However, in male patients the results did not show the same pattern (see Table 2).

Discussion

The first conclusion derived from this investigation is that S-IgA levels fluctuate within 1 hour's time, and that this fluctuation is both detectable, and possibly meaningful. This finding is in harmony with Tsao et al. (1991), but seems to reject Henningsen et al. (1992). Of significance are the findings of this research that suggest music may be a notable adjunct for lowering anxiety in female patients. Increased understanding of females and their relationship to music could be of exceptional value when considered in terms of noninvasive analgesia during other procedures such as the birthing process.

Female patients who are pregnant are equally as subject to anxiety factors as are all people. It is known that pregnancy is often used as a reason to postpone visiting the dental office, when in fact, because of the hormonal and chemical changes going on within the pregnant female and their effects on gingival tissue, seeing the dentist for prophylactic reasons is fundamental. Thus, in the case of expectant females, music could be considered to ameliorate, or control anxiety during dental procedures. This solution is preferable to the more invasive nitrous oxide procedures that in the case of a pregnant female are contraindicated.

Significant measurements of S-IgA were ascertained during this investigation demonstrating tangible differences in responses between males and females physiologically. However, this could not be substantiated from the observations of the dentist and the dental assistant. In discussions between them, it was concluded from the outward manifestations of male patients that their reaction to music and nitrous oxide, or the combination thereof, was similar to that of the female patients.

Even though there are indications that males and females respond differently to music, it should be noted that the difference between the preoperative levels of S-IgA of males and females equaled only 1.15%.

There exists an inherent weakness in the eight groupings used in this study. This study was able to recruit only the least fearful patients. The patients who were in fact most fearful or anxious did not volunteer to be included in this investigation. Consequently, the patients from whom statistics would be most meaningful eliminated themselves from the research at the outset.

Summary

When referring to music in the context of this experiment, it is accepted that in all situations the music to which the patients were listening was delivered to the patient via headphone. This study does not refer to the "white" or "elevator" music found ubiquitously in all practicing dental offices. Additionally, within the limitations of the discussion of this study, the following are summary statements concerning the most applicable findings:

1. There is a strong physiologic response to music by females that equals or surpasses their response to nitrous oxide.

2. This response is very relevant for pregnant females. Music offers a nonpharmacological intervention for anxiety and stress when nitrous oxide is contraindicated.

3. Even though the statistics are insignificant for males, the trends shown in the raw data indicate justification for further investigation, including the element of learned responses.

Recommendations

Obviously, this study has investigated only the rudiments of information relevant to the relationship dental patients might have with music. If it is true that music can help reduce pain or stress at specific times, such as in the dental office or at the birthing experience, further investigation of these particular phenomena that impact women's healthcare is warranted.

Questions about age, interaction of the chemicals of the impression materials with S-IgA, more stringent saliva collection methods and the contamination thereof, plus the interaction of S-IgA in varying amounts of nitrous oxide/oxygen anesthesia would require the commitment of a dental school facility. The amount of time it would take to proceed to the next level of investigation would not be inviting for any practicing dentist in the dental office.

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A PILOT STUDY ON THE INFLUENCE OF RECEPTIVE MUSIC LISTENING ON CANCER PATIENTS DURING CHEMOTHERAPY

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Abstract

The effect of receptive music listening on reducing the emotional trauma, anxiety, and tension associated with cancer and chemotherapy was evaluated on 33 cancer patients, ages 18 to 81. All had serious neoplasm, were receiving cytostatics and the antiemetica, Ondansetron. Patients were given the Spielberger State-Trait Anxiety Inventory (STAI) and questionnaires relevant to their physical symptoms, musical preferences, and effectiveness of the music after the therapy. A psychologist/music therapist interviewed the patients prior to chemotherapy to explain the program, to determine reasons for listening and to help select appropriate/preferred CDs from diverse categories. The majority requested music for relaxation and diversion purposes. Classical music and classical CDs produced for relaxation were the most popular. Patients reported high satisfaction and all requested music during future chemotherapy. The Spielberger STAI was not well accepted. The data suggests that receptive music listening as an adjunct during chemotherapy should be investigated more thoroughly.

Introduction

The use of receptive music listening for anxiety reduction has been used and documented in several major medical arenas: in neonatology (Caine, 1991; Cassidy & Standley 1995), during childbirth (Halpapp, Spintge, Droh, Kummert, & Kögel, 1986; Lex, Pratt, Abel, & Spintge, 1996), and pre- and peri-surgery (Kopp, 1991; Spintge & Droh, 1992; Reilly, 1996). The results in these arenas has shown music to be effective in reducing anxiety subjectively as well as objectively.

Evers (1991) lists other physiological stress parameters that can also be positively affected: pulse rate, blood pressure, breathing, galvanic skin resistance, and electroencephalograph (EEG). Music can reduce stress hormones (ACTH, cortisone) and increase the emotional hormone, beta endorphin, acting as a protection mechanism against emotional excitation (Spintge & Droh, 1992). Spintge (1991) reports levels of neurohormones and neurotransmitters such as dopamine, noradrenaline, endogenous morphines, encephaline and phenylethylamine can also be elevated through music.

Just as pertinent is the positive effect on the emotional well-being of patients due to the power of music's suggestive and persuasive elements to stimulate the unconscious autocratic responses and lower certain brain hormone levels (Scartelli, 1992). In addition, Metzler and Berman, 1991 noted that when a patient's attention is diverted from an invasive procedure, the patient often feels less anxious and experiences less distress.

Literature Review

No diagnosis is more devastating for a patient than cancer, few are more dreaded (Illich, 1976), and the psychological impact of the disease can be devastating (Holland, 1996). Cancer patients are confronted with a threefold trauma: the diagnosis and symptoms of the disease, the prospect of ongoing therapy (Todres & Wojtiuk, 1979) and the fear that the disease will return (Vettese, 1976).

Side effects are varied and can range in severity. Coates et al. (1983) note the following side-effects as the most distressing from the patient's perspective: vomiting, nausea, loss of hair, anxiety, moodiness, length of hospitalization, fear of injections, difficulty in breathing, fatigue, insomnia, family problems, and possible changes in the ability to continue working. In cases of relapse, Weisman (1979) cites that patients are very demoralized and often experience a "landslide" effect.

In 1927 Treves reported that listening to music had a strong beneficial effect on cancer patients psychologically. Since then studies by Frank (1985); Pfaff, Smith and Gowan (1989); Standley (1992); and Berner and Herrlen-Pelzer (1996) clearly indicate the immediate and long-range benefits of music's capacity to offer an effective, easily implemented and positive intervention during chemotherapy.

Other research (Harvey, 1987) has shown that sedative music can support relaxation as it may trigger autonomic nervous system reactions, producing changes in respiration, pulse rate, blood pressure, brainwave frequency, muscle tone, etc. In addition, Brodsky (1989) found that quieting music can allow the patient to relax and have a more pleasant experience and the therapy itself may become much less threatening. By choosing the music, volume, listening time, etc., the patient is offered some control over the situation, (Cotanch, 1983) and a distraction from the surroundings (Cook, 1986). The positive effects of music also increase when the patient is allowed to listen to the music he prefers (Daub & Kirschner-Hermanns, 1988; Davis & Thaut, 1989). Finally, Standley's study (1992) did not find patients bringing music into association with chemotherapy afterwards.

The major forms of coping: hypnosis, progressive relaxation training, systematic desensitization (Morrow & Dobkin, 1988), progressive muscle relaxation (Cotanch & Strum, 1987), and mental imagery (Simonton, 1992) all require preparation and/or instruction.

In addition, Redd and Andrykowski, (1982) comment that even when patients learn desensitization and relaxation techniques, they are often too overwrought to employ them without a therapist.

Methodology

The aims of the study were:

- To offer emotional support after the impact of a cancer diagnosis and during the ensuing hospitalization and chemotherapy.
- To reduce tension and anxiety during chemotherapy and improve the overall hospital stay.
- To facilitate better coping and a sense of well-being by reestablishing a "normal" environment through the use of familiar music.
- To offer extra palliative care for the patients without undue interference in the normal hospital routine.

The following questions were addressed:

- Have these patients done anything to emotionally prepare themselves before and during chemotherapy?
- Are these patients interested in listening to music during chemotherapy?
- If so, why and what kind of music do they want to hear?
- Can it be easily initiated and managed with very ill patients, under such difficult circumstances?
- Can the emotional and physical distress of chemotherapy patients be accurately measured?
- Will it be an effective adjunct?

The Setting

This one year pilot project took place on a 20 bed ward in the Oncology/Hematology Department at the University Klinikum Groflhadern, Med. Klinik, III, Munich, Germany (a 2,000 bed, teaching hospital). Many of these patients were severely ill, some terminally so. Their average stay was 3 to 4 days per treatment cycle, however, the course of the disease often caused the treatment to vary, increasing hospitalization by several weeks to months including a period in isolation.

Patient Selection

Thirty-five cancer patients were given the option of listening to music during their chemotherapy after they arrived for their treatment. No one particular type of cancer was selected. Two groups were established: Group 1, patients receiving chemotherapy for the first time with music (Table 1) and Group 2, patients who had previously had chemotherapy without listening to music (Table 2).

Research Instruments

1. The Spielberger State-Trait Anxiety Inventory (STAI).
2. Form I. A subjective 20-item questionnaire pertinent to the symptoms and concerns of cancer patients. (Rated on a scale of 1–4).
3. Form II. A questionnaire to determine their reasons for listening to music and preferences.
4. Form III. A questionnaire at the close of therapy to evaluate the effectiveness of the chosen music and the listening itself (both rated on a scale of 1–10) and to determine if the patient desired to listen to music during the next chemotherapy and if so, what music.
5. An introductory interview with the psychologist/music therapist to explain the program, discuss reasons for listening and choosing music.

Procedure

After filling out the questionnaires and completing the interview, patients chose appropriate CDs from different musical genres and styles (classical, light orchestral, German folk music, pop, light rock, jazz, and slow movements of classical music produced for relaxation purposes). A selection of over 350 CDs was available to meet personal preferences, to prevent patients from listen ing repeatedly to the same music, and it was hoped, to avoid bringing music into association with therapy after hospitalization.

Each patient was given the selected CDs, portable CD player, shown how to use the equipment, and advised to start listening to the music 15 minutes before the onset of therapy in order to help reduce anxiety. (Due to the many medical tests and waiting for results, chemotherapy could be delayed up to a whole day and it was not always possible to be with a patient when it commenced.) At the end of therapy the patient was asked to complete the short evaluation questionnaire.

Results

Fourteen males between the ages of 18–81 and 19 females between 18 and 72 participated. The median age was 51. Two patients declined the offer, but asked to keep the option open. All had serious neoplasm and many had already had extensive chemotherapy.

The following demographic sheets (Tables 1 and 2) were used to record the patients' diagnoses, treatments and number of times they listened to music.

Table 1
Group 1: Patients Receiving First Chemotherapy With Music

Patient No.	Age	Gender	Diagnosis	Chemotherapy	No. of Times Music Heard
	62	f	Liver Carcinoma	Etoposide, Ifosfamide, Adriamycin (EIA)	4
	39	f	Sarcoma	Etoposide, Ifosfamide, Cyclophosphamid (EIA)	4
3.	19	m	Embryonal Carcinoma	Etoposide, Ifosfamide, Cisplatin, Doxorubicin	
4.	47	f	Osteogenic Sarcoma	Vincristin, Adriamycin, Ifosfamide (VAIA)	
5.	76	m	Non-Hodgkin's disease	Cyclophosphamid, Vincristin, Procarbazine, Prednison, Adriamycin, Bleomycin (COPBLAM)	
6.	44	m	Sarcoma	Ifosfamide, Doxorubicin	2

Table 2
Group 2: Patients Who Previously Had Chemotherapy Without Music

Patient No.	Age	Gender	Diagnosis	Chemotherapy	No. of Times Music Heard
	68	m	Colon Carcinoma	Leucovorin, 5-Fluorouracil (5-FU)	10
2.	56	f	Adeno Carcinoma	Adriamycin, 5-Fluorouracil (5-FU), Cyclophosphamid (FAC)	9
3.	73	m	Liver Carcinoma	Carboplatin, Doxorubicin	1
4.	36	m	Sarcoma	Etoposide, Ifosfamide, Adriamycin	2
5.	68	f	Breast Cancer	5-Fluorouracil (5-FU), Adriamycin, Cyclophosphamid (FAC)	9
6.	47	f	Lung Carcinoma	Etoposide, Adriamycin, Cyclophosphamid (ACE)	4
7.	81	m	Non-Hodgkin-Disease	Cyclophosphamid, Doxorubicin, Vincristin, Prednison (CHOP)	3
8.	56		Multiple Myeloma	Vincristin, Adriamycin, Dexamethason (VAD)	1
9.	72		Acute Myelogenous Leukemia	Vincristin, Adriamycin, Cytarabine (AML-12 protocol)	3
10.	44		Breast Cancer	Cyclophosphamid, 5-Fluorouracil (5-FU), Methotrexat, (CMF)	1
11.	69	m	Sarcoma	Etoposide, Ifosfamide, Adriamycin (EIA)	1
12.	72	f	Breast Cancer	5-Fluorouracil (5-FU), Doxorubicin, Cyclophosphamid (FAC)	6
13.	36	f	Hodgkin's disease	Cyclophosphamid, Vincristin, Procarbazine, Prednisolon / Doxorubicin, Bleomycin, Vinblastine, Dacarbacin (COPP/ABVD)	2
14.	18		Sarcoma	Vincristin, Cyclophosphamid, Dacarbacin	5
15.	52	m	Non-Hodgkin disease	Ifosfamide, Epirubicin, Etoposide (IEV)	3
16.	59	m	Pancreas Carcinoma	Cisplatin, Gemcytabine	1
17	19	f	Thymoma	Cyclophosphamid, Vincristin, Procarbazine, Prednison (COPP)	5
18.	62	f	Colon Cancer	Leucovorin, 5-Fluorouracil (5-FU),	8
19.	59	m	Multiple Myeloma	Vincristin, Adriamycin, Dexamethason (VAD)	4
20.	27	f	Hodgkin's disease	Cyclophosphamid, Vincristin, Procarbazine, Prednisolon / Doxorubicin, Bleomycin, Vinblastine, Dacarbacin (COPP/ABVD)	3
21.	38		Acute Myelogenous Leukemia	Amsacrine, Cytarabine	1
22.	55		Sarcoma	Etoposide, Ifosfamide, Adriamycin (EIA)	3
23.	43		Lung Carcinoma	Adriamycin, Cyclophosphamid, Etoposide (ACE)	2
	43		Seminoma	Etoposide, Ifosfamide, Cisplatin (EIP)	2
25.	46	m	Non-Hodgkin's disease	Ifosfamide, Epirubicin, Etoposide (IEV)	2
	56		Non-Hodgkin's disease	Ifosfamide, Epirubicin, Etoposide (IEV)	3
27.	47	f	Sarcoma	Ifosfamide, Doxorubicin	2

In addition to the above chemotherapy, all patients were routinely given the antiemetica Ondansetron (Zofran®)—8 mg before and during chemotherapy, per day.

Patients were generally in a state of emotional upheaval (Table 3) before therapy and their distress rose as the therapy continued.

Table 3
Emotional State of Patients Before Chemotherapy

	Group 1	Group 2
Variable	*n*	*n*
Agitation		
Anxiety		
Depression		
Fear of side effects		7
Hope of cure		14
	Group 1: $n = 6$	Group 2: $n =$ [illegible]

Eight patients had tried to prepare for chemotherapy or actively deal with their cancer. One was meditating, 3 were trying autogenous training, and 4 were using the visualization technique developed by the Simontons. However all reported being so overwrought at entering the hospital that they were unable to relax enough to use these techniques.

Only 4 patients brought music with them. The rest were pleasantly surprised at the offer, especially the older ones who were not familiar with CDs and portable equipment. Their interest in the project rose when they learned that they could choose the music they preferred and/or could bring their own CDs. As seen in Table 4, participants often had more than one reason for listening to music.

Table 4
Reasons for Wanting to Hear Music

Variable	Group 1	Group 2
		7
	Group 1: $n = 6$	Group 2: $n = 27$

Classical music was the most requested (Table 5) and piano and guitar were the most popular instruments, considered more relaxing than large symphonic music. Mozart was the most requested composer, followed by classical music CDs specifically produced for relaxation purposes.

Table 5
Choice of Music

Type of Music	Group 1	Group 2
Classical		
(Baroque – Romantic)		16
Quieting (classical)		
Light listening		
Pop	2	
Light Rock		
Big Band		
German Volksmusik		
Jazz		
Own	3	7
	Group 1: $n = 6$	Group 2: $n = 27$

Patients were allowed to use their music outside of chemotherapy. They often requested everything else for the hours in between, usually something cheerful and lively to combat depression.

Some patients required 1 or 2 treatments to find "their" music. Several patients always wanted the same music because they were sure "it worked." The majority preferred listening to different pieces each time or brought some of their own favorites to add to the selections.

The music also helped in other ways. Eight patients had traveled a great distance by themselves to get to the hospital. The music helped alleviate their loneliness. It was a big aid in keeping anxiety under control while waiting for the therapy to begin, a distraction while getting hooked up to the chemotherapy, and for many the music seemed to make the time go faster during therapy.

On the one hand it blocked out what was going on around them and was a help in getting them through a night when they had difficulty sleeping or if their roommates were agitated. On the other hand, it alleviated some of the sensory deprivation for those with long hospital stays and/or those in isolation.

Patients reported that their fears and depression were greatly influenced by seeing so many bald, thin, very sick, and dying people. They were frightened that these things might happen to them. The music helped them "bounce back" and reestablish a more hopeful and optimistic outlook.

Only one person brought music into association with chemotherapy after she went home. She had listened nonstop for 6 hours. She did without music one time and then listened less.

Several patients found CDs they liked so well that they bought them to listen to at home. No one reported bringing this music into association with chemotherapy. We assume this will not be a future problem.

The music had a definite quieting effect, clearly evident in more relaxed facial expressions and a decrease in muscle tension. Comments ranged from: "It was a wonderful diversion," "I could concentrate on other things, happy memories, etc." or "I was so relaxed I could fall asleep and forget where I was for awhile."

During a high fever or aggressive therapy phase, patients preferred silence. They were too ill from certain cytostatic drugs and emotionally overwhelmed with what was happening to them. When they felt better, they requested music again.

Patient satisfaction with their chosen music was generally good and tended to rise as they discovered which music was most helpful. They also were generally pleased with the effect of the music during their chemotherapy (Table 6).

Table 6
Mean Perceived Satisfaction With Effect of Musi

	Group 1	Group 2
Variable	Mean Rating	Mean Rating
		7.1
		7.2
		6.7

Maximum score = 10

Group $n = 6$ Group 2: $n =$

Patients were more grateful for the music, the longer the therapy continued. This was especially noticeable with Group 2 who had experienced weeks of chemotherapy without music. They were amazed at the difference it made and had not expected it to be so helpful. Their standard comment was, "Why weren't you doing this before?"

All participants who listened to music wanted to use it for their next chemotherapy and continued to do so.

Eight of the patients had a difficult time with the Spielberger State-Trait Anxiety Inventory. They repeatedly stated that they were disturbed by the questions. Two started crying. The participants openly expressed a preference for the questions that they could fill out more personally and the questionnaire which directly addressed their physical problems and emotional concerns with cancer and chemotherapy.

Staff Reaction

Every attempt was made to incur as little extra work for the staff as possible. After initial skepticism, they accepted the program into the hospital routine. Their support and cooperation have made the program's continuation and expansion possible.

Discussion

This pilot project was based on the premise that music listening would be a simple, on the spot, easily manageable adjunct for offering emotional support. The program was well received. Participants were relieved to know that the therapy experience could be lightened and some of the symptoms and difficulties alleviated through music.

There was a high preference for classical music. Twenty-five patients were over 40 years of age and musically knowledgeable. The majority had a university education. These factors appeared to have played a role, although even the teenagers wanted the "quieting" classical CDs. The reasons for choosing classical music ranged from simply loving the piece or composer to the often heard: "I finally have time to really 'listen' to a piece and appreciate it" to "there is more substance and depth in this music and it offers more comfort". Patients also reported they could sense a composer working through and resolving problems during a piece and that this helped get their "fighting spirit" back. This high percentage also could be due to the role of classical music in German culture and the lack of available categories such as "religious" or "gospel" music.

Participants did not prefer the selection of "New Age" (Hanser, 1989) music stating that it did not have enough substance or was boring. However, the classical CDs of slow movements were used frequently. Because reducing anxiety and relaxation were patient priorities, it seemed logical that they would be inclined to choose sedative music (Standley, 1986; Cook, 1986; Kaempf & Amodei, 1989).

As reported by W. Davis and M. Thaut (1989); V. Stratton and A. Zalanowski (1984), allowing each patient to choose the music he preferred was very important. It definitely increased the number of participants, their satisfaction with and desire to continue in the project, and made the experience individual and personal.

The high level of aversion to the Spielberger State-Trait Anxiety Inventory (Schipper et al., 1984; Aaronson, 1990) was unexpected. Many patients were already emotionally overloaded and did not want to be confronted with questions about anxiety, tension, happiness, etc., before or during chemotherapy. It is believed that either a suitable "Quality of Life" test must be found or one must be written that can also address different cancers and their effects on quality of life (Testa & Simonson, 1996).

As Nolan (1989) reports, it was also one topic of conversation and process that was not cancer dominated. From the therapist's point of view, choosing music established a very quick, personal contact and discussing their favorite music allowed patients to share their lives in a lighthearted and nonthreatening way.

Although research by Spiegel (1994) and Maunsell, Brison, and Deschênes (1995) points to the numerous benefits of psychotherapy, from shorter hospital stays to longer survival rates, only 2 out of 33 people asked to be referred to a psychologist and no one wanted to be in a group. The music listening was often the beginning of conversations dealing with their more difficult concerns and problems and at least offered some emotional release.

There was a certain amount of upheaval due to rotation in doctors, changes in the form of treatment (Gralla, 1989) and voluntary termination of treatment. Twenty-one of the patients died within this time span.

In spite of this, the program proved relatively simple to implement. The CD collection grew according to the patients' wishes and after the initial outlay, the costs remained low.

The project is continuing on this ward and music has begun to be given to the Leukemia patients throughout the hospital. They are especially grateful because of long periods in isolation.

These results are mostly based on self-reports. It would be best to conduct more objective research. For example:

– Some patients have reported sleeping better when they have been listening to music (also observed by the staff). Is it possible to reduce the amount of sleeping pills?

– Some patients would like to work more intensely with music, relaxation, and visualization in order to reduce their pain killers.

– Studies by Frank (1985) and Standley (1992) show that music can help in easing nausea and vomiting. This raises a question:

– Can the amount of antiemetica be reduced by listening to music?

– Findings by Bartlett, Kaufmann, and Smeltakop (1993) on the influence of music listening on Cortisol and Interleukin-1 with college students are encouraging. Can Interleukin-2, 12, and 15 also be influenced with cancer patients, as these are the main markers for immune response and are also used in immunotherapy?

Conclusion

Patients receiving long-term chemotherapy are faced with repeated hospitalization and usually experience continuous anxiety. They return regularly to the hospital for more therapy, knowing it will probably be very unpleasant and without any sure guarantee that it will affect a cure. The authors believe that it is imperative that patients in this situation be offered extra assistance. Receptive music listening is one way to confront and help alleviate such anxiety.

Acknowledgment

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CREATIVITY AND MEDICINE: AN *ATELIER* IN MEDICAL SCHOOL

Mary Anne Bartley

Premise

The Medicine and Art course was designed to directly involve medical students in the process of creativity. The concept is based on research findings that we remember 20% of what we hear; 40% of what we hear *and* see, but 75% of what we see, hear, and do. In other words, people of all ages learn best when invited to actively participate in learning, are challenged, and have fun in the process. Art becomes the medium to engage the imagination and learn how to think in new and bolder dimensions.

This is not a traditional art instruction program. The goal is to uncover the creativity and imaginative powers that we all have. They may be buried under layers of discouragement and self-denial, but they're just waiting to be tapped. Art is nurtured by social engagement; its direction, power, and authenticity joined and fueled through connectedness with others. The artists' work grows and gains power when their creativity is shared with others. The quintessential lesson to be learned: Doing art is therapeutic in itself. *Time disappears, noise diminishes, peace comes, the body relaxes, and the artist emerges.*

Genesis

In 1994, Medical College of Pennsylvania (now part of Allegheny University of the Health Sciences) launched a search for an "artist/scholar" to develop a Medicine and Art Course. Professor Luther W. Brady, M.D., eminent physician/scientist/art collector-expert, placed my name in nomination and provided a grant to create the course for medical students. The four-credit course commenced in the first semester of 1994 and is an outgrowth of programs developed by this writer as artist in residence at Villanova University Art Gallery (1991–present).

My personal odyssey has been to bring the joyful and healing powers of art to people in all walks of life. I have seen art's liberating effects on each audience and there is no doubt in my mind about the healing, recuperative, imagination-provoking, and mind-stretching powers of art. Art teaches how to think. Guided by minimum instruction and given the freedom to paint outside the lines with colors of their choice, students from 6 to 96 quickly learn to plumb their imaginations and experiment with their God-given creative powers. The inner trust of self that follows becomes a basic building block to knowledge. Almost to a person, the before-art and after-art differences were palpable. People were touched and became playful. Something spiritual was evoked. Men and women in their 90s who insisted they had no creative powers looked at their creations and took pleasure in what they saw. The icons created by children were images of themselves and they reveled in their discoveries. Youthful offenders held for capital crimes in a detention center where few safe outlets exist for expression displayed talents that had not before been imagined by them or their teachers. Elementary school students who had never before had an art class were creating self-portraits within the first lesson.

How It Works

To see the world in a grain of sand, and heaven in a wildflower;
hold infinity in the palm of your hand and eternity in an hour.
—William Blake

In essence, the program evolves as a work of art in process, a freestanding, curriculum-enhancing tutorial with a minimum of instruction and a maximum of fun and self-expression. A fundamental rule is enforced, this is *not* a spectator sport: Everyone present must participate. Denials of ability quickly fade. Curiosity prevails. The classroom, hospice, or corporation becomes an *atelier* (artist's workshop) where participants learn a mathematical model for the human face, rules used by artists throughout the centuries from Michelangelo through the present. One basic concept is imparted: All human heads are shaped the same. Eyes, ears, nose, mouth, etc. are located in relation to one another. Students are shown this by way of a simple line drawing on the chalk board that places the components of the human face on the planes of a horizontal and vertical "scaffolding".

Once this concept is grasped—and it takes only a few minutes—students create their own portraits. It's an incredible process to watch. Depictions of human heads emerge. Eyes are put in their proper place midway between crown and chin, ears begin at eye line and end at the plane of the nose tip. If you look around and watch the students' faces, you can see their imaginations spring into view. The second portraits, and all those thereafter, students do on their own.

They've been given the concept, the rules of structure. Now they're free to break the rules, to chase the limits of their imaginations and when offered the freedom, to go beyond them again. The results are quite amazing. The unfolding that follows is a joy to watch. You can almost see students' imaginations—even the most self-doubting—leap into their own view. They know they have understood something of value; that they have gained a basic precept to be used time and again in different ways. They have become explorers of their own imaginations, which is the essence of all knowledge.

Atelier in Medical School

As part of the instruction program, a studio with simple materials is created in the medical school classroom. The configuration of the room is changed to resemble an artist's workshop. Creativity is contagious. Students sit side-by-side and across from each other in a circle of creativity. When their own imagination wanes, the close proximity to the art of others inspires a new approach or dimension.

The work of artists such as van Gogh, Klee, Picasso, and Matisse are investigated, compared, discussed and borrowed from. Works of contemporary physician artists are also explored. Included this year were the heroic and profoundly moving portraits created by Wilma Bulkin Siegel, M.D., chronicling women with breast cancer and their journeys through healing.

Materials

Students are offered selections of art supplies and paints. They also choose from arrays of canvas on a variety of surfaces. Creativity explodes. Students begin composing an image or collage of images to form a work of art. It is exciting to watch. Bits and pieces of materials are cut and linked together, which then expand in scale and meaning. What begins to emerge is a series of self-portraits in the form of kites, masks, or paintings which take on the characteristics of interior landscapes reflecting personal stories of the fragment of a life and expressing deep feelings about the human experience. Built over time, and looking deep within, symbols are incorporated in a uniquely personal sequence that somehow emerge within a unifying framework. Frogs appear from nowhere. Great birds soar into life. Butterflies debut in glittering rainbows. Family portraits are gathered together and combined into a generational snapshot which is placed in homage within ancestral kites of gold and silver. Silver and black configurations merge into a bold and sensual tapestry which evokes startling images. Kites of every size and configuration take flight in a joyful cascade of colors.

The walls of the classroom become a gallery to hang striking works in acrylics and oil pastels. Some are literal, some primitive, others outrageously abstract, a few downright obtuse. The paintings and portraits are vibrantly alive. They celebrate life, creativity and the human spirit. Works created in the course were exhibited at the Morani Art Gallery (on campus) in 1994, 1996, 1997, and at Villanova University Art Gallery in June 1995.

Something New

One challenge arising from the course was to find a way of making it portable—that is, miniaturizing the art course into a diskette so that it could fit more easily into the hectic everyday life of a medical student. To accomplish this elusive goal, a culminating seminar was held in the computer laboratory of the medical school with the assistance of the technical staff. Computer generated abstract art was projected on screen and downloaded into each module. Students were given individual instruction on how to use a mouse to create bold and incisive images. Following the concept of "scaffolding of the face", students rapidly progressed from awkward clutching of the mouse into a freewheeling display of images depicted in arresting primary colors. Faces and abstract forms appeared everywhere. Quickly grasping the fundamentals, students were able to rapidly switch from one hemisphere to another—leaping from word to image and back again. Using a page of printed text (homework, research papers, etc.) students were encouraged to create bold images directly on it. What a moment! Images easily dominated words and the surge of creativity was unmistakable. Attention was so intently focused on computer screens that students had to be reminded to blink! If they liked what they created, images could be copy-cut-saved into a private art file (diskette).

The computer *atelier* provided an immediate playground for creativity—a stress relieving hiatus which permitted students to engage their imaginations and return to the process of writing/thinking thoroughly refreshed.

Summing Up

*Linear skeins of color become the metaphor
for the tangled threads of ideas,
the building blocks of creativity.
Soaring into the stream of life.
Stoking the imagination and evoking poetic images
of ourselves and others.*

Picture the hectic pace of today's medical school, with all the pressures inherent in a demanding curriculum, heavy study schedule, unrelenting examinations, and scarce time for creative or social pursuits. Dragging cares and woes, students struggle across the threshold of the classroom atelier and within minutes they are immersed in their art and visibly relaxed. They have come to a place where outrageousness is encouraged. Expression is the goal. In this milieu, students quickly evolve from passive to active learners. They report returning to their tasks and challenges armed with a personal mandate to help them tackle whatever they confront from new and more productive directions.

Some Institutional Benefits

The personal impact of the above art experience on four consecutive classes of medical students points to potentially strong organizational benefits for health care teaching institutions. Centered within the medical school, such a program would have a broad-based and salutary effect on staff, patients, visitors, alumni, and other important constituencies. Alive with the creative output of students and staff, the very walls of the institution would serve as testimony to a commitment to care. Art would be everywhere, enriching the environment and nurturing the spirit.

The creation of such an atmosphere would also serve as powerful public relations and marketing tools. Campaigns would utilize images and words founded upon respect and concern for the individual. Good will for the institution and its mission would flourish. The possibilities and benefits are endless.

Student Evaluations

Over the four year history of the course, one of the most striking results has been the evaluations (detailed in the following section) of the medical students as to the efficacy of the course for stress reduction and creativity enhancement. In a petition signed by the entire membership of the first class, the students wrote:

> We are writing to express our pleasure with the Medicine and Art Humanities Elective Course that was offered this Fall at MCP. We feel that this has been a most rewarding and stimulating humanities elective, partly because it was 'hands-on' and partly because art, both appreciation and participation, is so intrinsically important in any society. We hope this course is offered again so that other students may benefit and would like to suggest that a sequel, Medicine and Art II, be created and offered in the Spring.

In Their Own Words: Medical Student Evaluations

The Medicine and Art Course
Created/Taught by Mary Anne Bartley
Medical College of Pennsylvania –
Hahnemann School of Medicine
Medical Student Evaluations:
Academic Years 1994–98

"This course allowed us a rare opportunity to explore our creative sides that we just don't often get a chance to do while studying for our science courses. In taking this course, we got a chance to find a place for creativity and imagination in our studying as well as the chance to relieve a little stress. It was a lot of fun."

"Relaxing—time to release creativity."

"Opened my mind to the benefits of being creative."

"Uninhibited creativity flow, stress relief, being encouraged to see different perspectives, relaxed atmosphere, interactivity with Mary Anne Bartley."

"If there could be a second course, such as Medicine and Art II to further explore a lot of techniques and styles we only had a chance to touch on."

"It would be a good idea to have a room with art supplies for students to use (e.g., like a gym) art could be used to learn and study class review too."

"Course was very helpful, relaxing, and soothing. Material—paint and boards/paper were plenty. More drawing instruction could help even more. This course should definitely be continued."

"This course is great. It was so interactive and collaborative. Ms. Bartley encouraged us to use our energy in a nonmedicine way. I have always anticipated using art in my practice of medicine. This has further strengthened by convictions to do so."

"It makes you think about the human aspect of medicine. Art is a reflection of emotion, a uniquely human quality."

"Encourage students to see a different side of themselves. To express themselves and see how they can encourage others to express themselves."

"Self-expression as well as understanding the emotions of others."

"Future doctors learn to use their humanistic sides—learn how to express feelings, not just thoughts."

"I realized how healing art can be and I think it is a valuable resource that should be made available to all—doctors and patients alike."

"I hope to use what I've learned to be a more effective and caring physician."

"Continue to draw, paint, and create to relieve stress."

"I'll better appreciate the therapeutic effect art can play in treatment."

"I'll continue to doodle whenever I need a break; it's more fun and more productive than watching TV."

"Relaxation and expression of what's trapped inside."

"If made available to patients, art can be a valuable means through which patients could communicate and express their feelings."

"In med school, a lot of emotion, insecurity and energy is spent in rote memorization. Art class puts a small gleam of balance—that of creating rather than just learning what has gone before."

"The importance that art can hold in an individual's life. The self-expression that art allows."

"I learned a new way to express myself."

"I realized that I had a creative side to me after all."

"I learned some great basic art skills and to relax and express feelings through art."

"Opportunity to express creativity, teacher's enthusiasm and inspiration, round table classroom environment (able to see other students' work)."

"The relaxed accepting atmosphere [was] totally different from med school!"

"It helped me to relax beyond my expectations. I could create without set boundaries. I could discover the artistic side of myself."

"It made me feel *human*."

"The relaxation of art therapy helped me cope with the second year."

"The instructor's enthusiasm and vibrancy made it easy to push aside any fears about expressing oneself. This is by far the best humanities course I've taken here—it allowed artistic and personal growth and was a welcome change from the lecture format."

"The realization of how therapeutic art can be."

"I liked having the opportunity to do something *creative*! It was nice to feel like nothing I did was being evaluated or criticized—it was a liberating experience to be able draw something or make something based solely on my own ideas. The instructor was so enthusiastic and so much fun. She definitely made everyone feel competent and appreciated."

"Exploring medicine through other media—challenging ourselves to be creative and to take on projects that we don't know how they'll turn out and to use our creativity and flexibility to make them work."

"The whole thing. Art is a great stress reliever and encourages creativity."

"The energy—I always felt calm, relaxed, aware after the class."

"It brought out a creative side that is often buried in medical school. It may not be 'essential' to the field of medicine but I certainly feel it was essential for my peace of mind."

"This class was fun and relaxing."

"This class was such a great release from the daily medical school life. It was nice to be able to exercise a part of my brain that's been kind of sedentary for a while."

"I loved this course. There should be an art studio for student use."

"Should be offered all year! Should be *mandatory*."

"Best humanities course I've taken. The hands-on experience was refreshing. I'll love to see this course with its current format offered next semester."

INTERVIEW WITH DR. LARRY DOSSEY

Norman A. Goldberg

Editor's note: This interview was conducted at the second Alternative Therapies Conference in April, 1997, in Orlando, Florida.

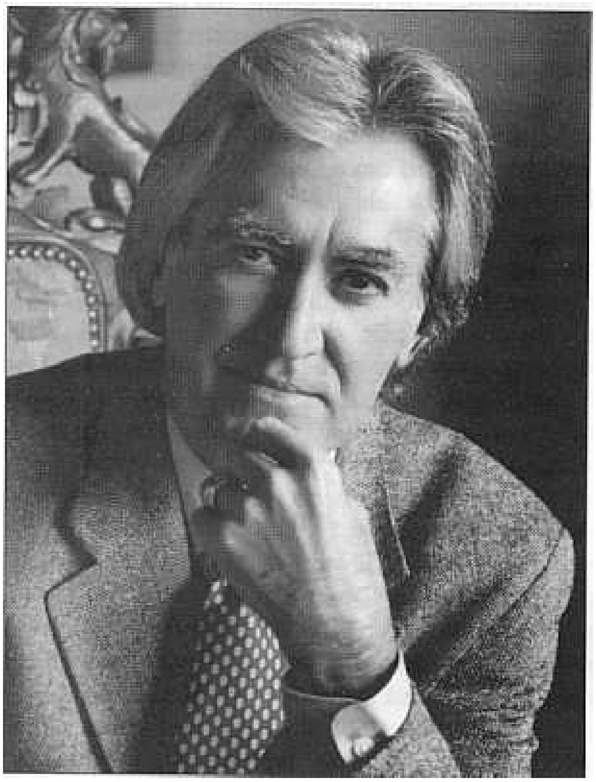

Photo: Athi Mara

Larry Dossey, M.D.

IJAM: You reached far beyond normal medical boundaries for healing and wellness into the realm of prayer. How did this large leap reconcile with your growing up in a fairly fundamentalist Texas atmosphere?

L.D.: I cycled out of fundamentalism into hard-core science in college and medical school, becoming an agnostic. I remained that way for many years. But as I was finishing my medical training I discovered the writings of several authors in the fields of oriental philosophy, Buddhism, and Taoism helped me to regrow my spiritual roots. These oriental teachings sounded eminently sane to me at the time. I then discovered the mystical tradition within the Christian tradition, which I did not know existed—this through the writings of Evelyn Underhill, the great English mystic. Her book, *Mysticism*, published in 1911 and still widely read, investigated the mystic tradition in Western Catholic and Protestant faiths. I thought mysticism existed only in the East. To discover that it existed in the West as well as in the East, including the faith I had rejected, was invigorating.

To me, prayer has proved to be a link uniting all religious traditions. It is a universal bridge between faiths. It has also been a bridge for me between science and spirituality. As I have written, there is a compelling body of evidence showing that prayer works in the laboratory when subjected to scientific tests.

IJAM: And you are getting hard data?

L.D.: Yes, we are getting hard data that is compelling and convincing.

IJAM: Where can we find such data?

L.D. : I invite you to look at my books on this subject. You can save yourself a lot of trouble. I've collected evidence from over 130 studies, and the citations and references are summarized in my book *Healing Words*. There are other researchers whose works you can pursue, such as Daniel Benor, Jeffrey Levin, and David Larson. All their references are cited in my book. So this information is easier than ever to find.

IJAM: This is similar to MusicMedicine. We are publishing much data in the field coming from excellent researchers around the world. It is no longer only anecdotal.

L.D.: I realize that. A friend of mine, Dr. Cathie Guzzetta, who has a Ph.D. in cardiovascular nursing and who was chair of the Cardiovascular Nursing Department of Catholic University of America, has done research on the ability of self-selected music to lower the level of anxiety in cardiac care units. We also used music in my hospital in the cardiac catherization lab, with the same effect.

IJAM: This is similar to the use of patient-selected music by the leaders of the International Society for Music in Medicine at the Sports Hospital in

Lüdenscheid, Germany. They have documented over 100,000 cases showing that the amount of anesthetic is cut by 50%, pain is relieved, healing is speeded, and hospital stays are shortened.

L.D.: This has the ring of common sense to most people. Music is such a powerful force, it is integral to our lives. But common sense isn't enough. In order to bring music into medicine, we must have the research studies.

IJAM: The data is coming. I have discussed your work with physicians in my congregation. Judging from their reactions, I assume that you must have had an original reaction of dismissal from the profession.

L.D.: This was true early on, but not anymore. Fifteen years ago my work was ignored but I've never really been beat up on (chuckles) by my colleagues, which is a surprise to many people. Lots of individuals think my work is so outrageous in medicine, that they think I must have been crucified many times over, but that has not happened. Currently I am happy to say I cannot keep up with invitations to speak at hospitals and medical schools. I seem to be one of those fortunate individuals who has lived to see his outrageous ideas honored in medicine, and I am truly grateful for this. As an example, since my book *Healing Words* was published in 1993, nearly thirty medical schools in this country have developed courses that examine the role of religious devotion and prayer in health.

IJAM: We must humanize medical education and medical practice.

L.D.: Of course. Things have become far too mechanical in healthcare. As a result physicians and other healthcare workers have become spiritually malnourished. Most of my colleagues in medical schools and hospitals want the spiritual element to return. It hasn't felt good to practice medicine without it.

IJAM: How does this fit into the new HMO scene?

L.D.: I think it fits pretty neatly. As you mentioned, it gets people out of the hospital more quickly and speeds healing. For the HMO this is not a matter of philosophy, but the bottom line—if people are discharged earlier they make more money. HMOs understand numbers. Dr. Herbert Vinson of Harvard Medical School, author of the book *Relaxation Response*, gets at least one call a week from some HMO which has heard about these studies showing that spirituality and prayer shorten hospital stays and cut costs. They asked him to help them develop programs to teach these ideas to people enrolled in their HMO. This seems a crazy way to bring spirituality back into medicine—saving money—but we'll take it.

IJAM: It does not matter by which door we gain entrance.

L.D.: Perhaps this is the back door!

IJAM: I am working with a group of faculty at Washington University School of Medicine in Saint Louis on a Colloquium on Music and Medicine to be held January (1998). It seems that music and prayer work hand in hand.

L.D.: Prayer, spirituality, and music have always gone hand in hand. Some of the greatest musical works were written out of spiritual impulses—Bach and Handel, for instance.

IJAM: This second conference is a real testimony to alternatives in healthcare. With our current crisis we must find affordable and noninvasive therapies, and surely this is one that is coming.

L.D.: There is no question about it. It has the ring of rightness. If there is a common thread running through alternative therapies, it is that of compassion, caring, and love. That's one of the reasons people are drawn to alternative and complementary therapies. Without these qualities medical care is too inhumane, remote, technical, and cold. In alternative therapies we get something that feels warmer and fuzzier—the deep compassion and caring. We have largely lost that in modern medicine.

IJAM: You have added a significant pre-conference session on Integrating the Arts in Health Care to this Conference, as well as additional arts presentations during the regular program. How do you envision the future of this development?

L.D.: We've added these elements because music and the arts add a powerful healing factor to healthcare. They help people to identify and find meaning in their lives by becoming more sensitive to something more powerful and majestic than themselves—whether called "the spiritual," God, Goddess, the Absolute, or something else. Music and the arts help us fine-tune our lives. Without them, something is off key, literally and figuratively.

IJAM: This entire movement is rapidly growing, including such organizations as International Arts Medicine Association, International Society for Music in Medicine, various associations for music therapy, art therapy, drama therapy, poetry therapy, etc. How can we join together in a cosponsored symposium to conserve and coordinate efforts to gain maximum strength?

L.D.: I don't have a blueprint for this, but I believe it will evolve into a thrust of unity and coherence. We have to put our egos aside and realize that the most important factor is the patient, not the turf we each occupy. We've had to learn this also in the field of alternative therapies, where there are so many interest groups with their favorite therapy. What's best for the patient? How can we facilitate healing? If we focus on these questions we can achieve the unity we need. If we don't put our selfish interests aside, we don't deserve a place at the healthcare table.

IJAM: How can we move that process along, rather than sit and wait for it to happen?

L.D.: We need leaders who will come forward and marshall the troops. A leader who embodies this selfless vision. I believe there are visionaries out there who are capable of this. It does not matter who the leader is or which organization is out in front as long as we keep the long-range vision uppermost.

IJAM: Perhaps we need something like a Wellness Foundation.

L.D.: I agree. Right now I get letters from arts therapies communities, each of which implies that their group should be out front. My response is always that we are talking about healing and it doesn't matter who is out front. Our task is service! If we don't honor this central recognition—that we are here to serve—I have no sympathy for any organization or individual. As I mentioned, we've seen this competition between various factions of the alternative therapy field. It is silly, childish, and totally unbecoming to the ethic and vision of true healers.

IJAM: This is analogous to the music therapy field. The National Association for Music Therapy and the American Association for Music Therapy are unifying as of January 1, 1998, becoming the American Music Therapy Association. This was possible only because the leadership had the vision to see that the profession itself and the clients served were important, not the organizations or the offices held by individuals, What do you see as the future for alternative medicine?

L.D: You are asking for the long view. We are in the process of radically redefining the meaning of "consciousness." We are gradually developing a view in which consciousness extends beyond the immediate limits of the brain and the body—a view in which consciousness is eternal and immortal. We shall see a respiritualization of what it means to be a human being. We shall go beyond the use of sheer techniques in healing—using, herbs, acupuncture, surgery, or pharmaceuticals—and even beyond music, dance, or any specific form of art—and shall one day recognize that in some sense we are already immortal and perfect, endowed with the Divine. All the therapies we use will assist us in realizing this supreme vision. Of course we shall continue to use them to eradicate disease as well, but that will be a secondary effort.

IJAM: You seem to be thinking of a new watershed, as the Holocaust was in the opposite direction.

L.D.: It is a new watershed with respect to how we have recently defined ourselves as purely physical beings with no spiritual qualities whatever. That has been the accepted dogma in medical science. Now we have tremendous incentives for a new view—the scientific evidence, for example, that prayer works and that religious and spiritual practices add to health. So we stand at a landmark period in human history faced with a majestic opportunity. If we don't capitalize on this chance, we have no excuses.

IJAM: It is a great time to be alive.

L.D.: To be sure.

IN PRAISE OF HANDS

Jeanne Bryner

That they are slaves.
That each tendon's a rope
and the knuckles are pulleys.
That their white bones
line up like pieces of broken chalk.

They are bound by flesh
as leather around a Bible.
That they dance and write
in air the story
of what is lost, what is gained.

That they are soldiers
cut and bleeding, a link
to the heart's kingdom.
That they are so beautiful
a moon has landed on each finger.

That they are trained
for harps and hired for murder.
That the cuticles are shaped
like soft horseshoes.
They contain rivers.

That the ring finger's shyness
suffers when gripped by the powerful.
That the palm yields to blisters
and wears the calloused rags
of repetition.

That they are mythical
with their lifeline's hieroglyphics.
That they struggle
because of their great strength.
They are able to heal themselves.

That they know what it means
to draw the water
and work without pay.
That they will hide our eyes
and pray for our sins.

That they may lift the hammer
and lead our bodies to grace.
That they will make a print
like no other
until they wave goodbye.

ARTS MEDICINE EDITORIAL

Louise Montello

At his 91st birthday celebration, comedian Henny Youngman was asked what was the key to his longevity. Without missing a beat he replied, "Breathing."

Over the many years of working with stressed musicians on such problems as stage fright, memory slips, wrong notes, overuse injuries and the like, I have finally found the ubiquitous key to reversing almost any performance problem. How can there be only one solution, you may ask? The answer is within. It is your breath. The breath is the life force which flows in and through the body-mind allowing us to move, grow, and fulfill our soul's purpose. The breath is the link between the body and the mind. Inhaling, we are taking in life; exhaling, we are expressing life. When we are breathing deeply and our inhalations and exhalations are evenly timed with no pause in between, we are in a state of perfect balance and harmony. As our breathing becomes more rhythmic, the mind automatically follows suit. And with that steady rhythm comes a feeling of security and power that allows us the ability to move forward with confidence and once-pointed vision. Without the experience of rhythmic breathing which leads to a one-pointed mind, we are unbalanced, unfocused, untrue to the heart of self, untrue to the deeper message in our music. Yet how often do musicians hold their breaths or limit the amount of breath they take in because of tension and/or improper breathing techniques. Breath holding and arrhythmical breathing takes its toll on the act of performance and can lead to memory slips, stage fright, and generally unaesthetic performances.

Take a moment now and become aware of your breathing. Notice its rhythm, how it flows, where in the body it emanates from. It is noisy or silent? Do your breath patterns change with different thoughts and feelings? Are there places in your body that are "breathless"—devoid of the life force which allows you freedom of movement, spontaneity, and joy?

Tension and pain in the body often signify that the flow of breath into the stressed area is blocked due to an imbalance in the body-mind connection. The flow of breath can be interrupted by poor posture and anatomical abnormalities on the physical level. Poor posture also has emotional implications. For example, stooped shoulders may characterize low self esteem. Chronic tension stemming from unexpressed, unacceptable feeling states, such as grief and rage (usually related to unresolved trauma) can also block the flow of breath into a particular part of the body associated with those feelings (i.e., shoulders, lower back). On the level of the mind, deep, rhythmic breathing is often absent while a musician is engaged in repetitive, "mindless" activities like practicing scales and arpeggios. "Mindless" acts can be likened to playing exercises for hours without any aesthetic appreciation or breath coordination. We can literally be playing while our mind/breath is somewhere else. Thus we are not receiving the life-giving energies through the breath which sustain and nurture us in our musical activities. This is a dangerous practice for musicians which can lead to overuse injuries. Unfortunately, it is a very common occurrence in conservatory practice rooms.

If you are at all familiar with your own breathing patterns, you know that your breath and emotions are intimately connected. When you are anxious, you are usually breathing high up in the chest. The diaphragm is constricted and so it is impossible to take a deep breath. When you are sad, breathing turns into sighing, deep and heavy. When angry, the breath becomes fiery and staccato. It is possible for us to control emotional states through breath awareness and rhythmic breathing. This is particularly important in dealing with stage fright. When we become anxious, the body-mind responds by moving into the "fight or flight" mode initiated by the sympathetic arm of the autonomic (involuntary) nervous system of which breathing is an integral component. The threat of performance leaves us feeling powerless and at the mercy of unconscious forces. But since the breath is the link between the mind and body, we can use the mind to gain a measure of control through focus on the breath. We use our ego/will to direct the breath to become deep and rhythmic which brings the body-mind into a state of balance and harmony. It is especially useful to focus on lengthening the exhalation when we are anxious. This activates the parasympathetic arm of the autonomic nervous system which is associated with the relaxation response—letting go—being vs. doing.

Getting to know your own breathing patterns and learning how to practice and play in harmony with the breath can also facilitate performance mastery. When we are moved by a performer, we are moved by the quality of his or her breath as it is expressed through the piece of music. It is the breath/mind connection which brings the piece of music to life. Without perfect coordination between the breath/pulse of the composer and that of the performer, the music, while it may be executed perfectly, cannot move the performer or audience into a deeper aesthetic experience—its original purpose.

So, where do we start in learning to coordinate our breathing with our playing to ultimately achieve performance mastery? Start by taking time each day to observe your breath. Allow your breath to become deep and regular through the practice of diaphragmatic breathing. The diaphragm is a muscle which separates the chest and abdominal cavities.

When breathing diaphragmatically, this muscle moves down as your inhale, slightly pushing out the belly, and then moves up towards the ribs on exhalation, the belly flattening out at this point. There should be no movement in the chest. Try to breathe only in the belly area. To isolate this muscle while breathing, you can place a heavy book on the abdomen and watch it rise and fall. Or you can lay on your belly with your arms folded under your chin and actually feel the diaphragm as you breathe into the floor. Make sure you are also breathing into your back. Many people only breathe into the front of their bodies. Once you feel comfortable breathing diaphragmatically, also become aware of the quality of your breath. Make sure there are no jerks and pauses in your breath and that there is no noise.

Now you can allow the breath to become rhythmic by practicing even breathing. You can count four beats on the inhalation and four beats on the exhalation in a wavelike movement. For example, inhale, two, three, four, exhale, two, three, four. Practice this for about five minutes several times a day. In time, your breath will become steady as will your mind. In dealing with acute anxiety, practice 2–1 breathing. In this practice, you are doubling the length of time of your exhalation. So you inhale two, three, four, exhale, two, three, four, five, six, seven, eight. Don't worry if you cannot exhale for exactly eight counts in the beginning. In time, you will have no problem. This exercise really strengthens the diaphragm and if practiced daily will become automatic and quite useful during times of stress. These three practices will create a solid foundation for future work with the breath as it relates to practice and performance. I will share more of this in a future article. But for now, practice makes perfect.

REVIEW

Concetta M. Tomaino

Schaefer, Judy (1997). *Harvesting the Dew: A Literary Nurse Bearing Witness to Pain.* Long Branch, NJ: Vista Publishing, Inc. Softcover, 101 pp. ISBN 1-88025-446-8. Price: $12.95.

Harvesting the Dew is a collection of 60 original poems written by Judy Schaefer, who is both a registered nurse and poet. Schaefer suggests that Registered Nurses are aware of themselves as inflictors of pain as well as observers. The poems arise out of the keen daily observations by nurses of not just the pain and suffering but of courage and healing as well. She states that the nurse like the new mother needs to relive the experience by describing it. It is therapeutic to talk, yet nurses because of their training, are taught to deny their thoughts and feelings, and consider them subordinate to those of the physicians and patients. Poetry is a place to take those feelings and thoughts. As the author states, it resolves nothing, but describes and communicates a daily experience that has not been described in this way before. Her poem "Autumn's Leaves" is such an example.

Autumn's Leaves

I want to gather them all up
Take them home
like forlorn puppies
left at the side of the road
Like kittens rescued from the pond
I want to breathe back life
hold them, warm them
but I know better

Ms. Schaefer acknowledges that many medical practitioners remove themselves from the suffering of their patients and often from their own reactions to these situations. The nature of their training encourages them to do so, to keep an emotionally safe distance. Somehow being silent helps remove one from the reality of the hospital.

A Poem

A poem will come
at first voiceless
but it will surface
like gemstones
Diamonds rising
in a fitful tide on sand
Sparkling words
on paper will dance
in commemoration
of the young man
who died in this hallway
today

Ms. Schaefer hopes that nurses will be encouraged to acknowledge their feelings and have an outlet for their expression. In doing so, she believes the level of caring for both the caregiver and the care-receiver will greatly improve. In her descriptive essay included at the end of this volume, Ms. Schaefer concludes:

> Literary nurses as imaginative and talented witnesses to pain and suffering are in a position to inform and create a healing vision beyond pain and suffering for themselves, their patients, and fellow nurses. In the process, literary nurses will further define the caring that is crucial to the nursing profession.

Her poetry has been published in *The Lancet* and she has coedited, with Cortney Davis, the first international anthology of creative writing by nurses. She currently has four books of poetry in progress, *One Miracle at a Time, The Forest and the Trees, First Heartbeat,* and *The Last Vineyard in Paris.*

ISMM GENERAL STATEMENT FOR IJAM

The International Society for Music in Medicine (ISMM) was founded in 1982 at the First International Symposium, "Anxiety, Pain, and Music," held in Lüdenscheid, Germany. ISMM is a nonprofit, scientific, interdisciplinary organization devoted to understanding the mechanisms of music in medical treatment, and improving the care of patients through research, education, and communication. Members include health care professionals and scientists dedicated to these goals. ISMM sponsors international scientific meetings and publishes books. The *International Journal of Arts Medicine IJAM*, published by MMB Music, Inc., Saint Louis, Missouri, is the official journal of ISMM.

ISMM is a scientific association with two-thirds of its members being Medical Doctors. Annual membership dues are U.S. $80, including subscription to the *International Journal of Arts Medicine IJAM*.

The central office is located in Lüdenscheid, Germany with chapters in the United States and Europe

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The Seventh International MusicMedicine Symposium, *MusicMedicine: Expanding Horizons,* will be held at the University of Melbourne, Parkville, Australia on July 12–15, 1998.

The Conference is co-sponsored by the International Society for Music in Medicine (ISMM), the International Arts Medicine Association (IAMA), and the University of Melbourne, in cooperation with the Faculties of Music and of Medicine, Dentistry, and Health Sciences at the University of Melbourne, the Sportkrankenhaus Hellersen, Lüdenscheid, Germany, the MusicMedicine Research Laboratory, Lüdenscheid, Germany, and the ISMM Task Force on Music and Pain, Germany. This is the first MusicMedicine Conference held in the Pacific region.

For information on submitting abstracts for presenting papers or workshops, please contact Dr. Ralph Spintge at the address above, or:

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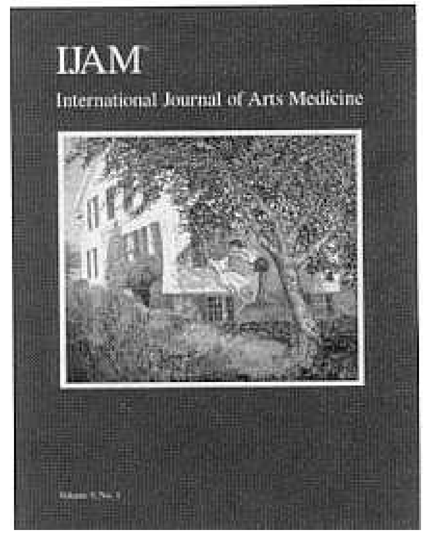

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