A Spoonful of Music

by Robert Wyatt, DMA

Pierre sits at his desk displaying a sense of hopelessness that children should not have to experience. Only moments earlier he had raced across the playing field like a seasoned competitor; yet instead of *passing* the baton, he had used it to injure any classmate in his path. And now he suffers because the music class is beginning and he is excluded from actively participating.

Yet when the big hand drum begins to resonate, Pierre's foot responds; his eyes come alive again and his body awakens. As other instruments enter the musical mix, his hands begin an elaborate *pas de deux*, with the rhythm and the mood of the music determining the choreography. A smile returns to his face and all injustice is forgiven, his attention lives within the present moment of sound. Pierre has ADHD and he is learning that *its* life and *his* life are not separate.

Consider for a moment the presence of the drum that shifted Pierre's attitude. By striking the dried and stretched hide with a mallet, sounds are produced which the brain automatically begins to process. As the sound waves cause the eardrum to vibrate, bones in the middle ear are set into motion; a fluid-filled chamber containing microscopic sensing organs in the inner ear is activated. Electrical sound codes are then sent on their way to the neo-cortex via the medulla, midbrain and cerebrum before arriving in the auditory cortex. From here, electro-chemical signals are transmitted to every part of the body, affecting not only our sense of hearing but also our sensation of location, balance, emotional comfort and safety.

Amazingly enough, this mechanism for hearing is fully developed in the fetus at the age of 143 days. All sound detected from the mother—especially her heartbeat and respiration—and her environment is processed within the fetal brain, an organ which is developing more slowly than its hearing apparatus. In effect, the sense of hearing "grows" the brain in a variety of ways.

Sound and music color every aspect of our world. Music is many things for people—enjoyment, intrigue, emotional suffering, relief, boredom, a soothing balm or cacophonous torture—and personal theories on musical preference, innate talent, giftedness, hearing and myriad other considerations abound. But whatever we may think or feel about our relationship to music, it is important to understand that sound and music plays an integral role in the way that we experience the world.

We have not formed our opinions of sound and music consciously. There is growing evidence supporting the theory that an evolving genetic code has shaped our brains to understand music in a fashion not unlike the one that thousands of years ago molded our brains to create language. In fact, music and language centers in the brain are separate

yet symmetrically oriented. (It is interesting to note that most infants can detect minute shifts in musical pitch in their fifth month, and three months later can remember a melody with such precision that a slight alteration of a single note will create a sign of surprise or displeasure.) The right-brain region for notes and musical passages corresponds to the left-brain region for letters and words, demonstrating how a neural mechanism present in each of the two brain hemispheres becomes specifically adapted for similar purposes, yet with diverse information or contents.

Also, our brains do not have sensors for time as they do for light and sound. Since our concept of time is a measuring of autonomously detected stimuli mixed within a context of short- and long-term memory, the brain really has nothing to *sense*. Instead, the psychological understanding of time is a creation of our nervous system registering its own relationship with the world—a sense of feeling what is happening to ourselves. Since sound and especially music is a temporal unfolding of physical events, it is sensed as having motion.

While experiencing ourselves in the world—in motion—another element must be considered: emotion. Most people listen to different types of music at different times because of the different emotions that the music elicits. Each incoming piece of music contains components of information—pitch, melody, rhythm, timbre (sound quality), amplitude and location—which is processed separately. The parts are then reunited and reassembled, but now they are charged with whatever emotional response the listener has attached to it. With very few exceptions, people can tell whether a piece makes them happy or sad. For this we can thank our limbic system (or mammalian brain)—that part of the brain that governs pain and pleasure, including sex, eating, fighting or fleeing.

In a person with ADHD, the limbic system is working normally but the cortical areas which focus attention, control impulses and integrate stimuli have yet to become fully active. PET (positron emission tomography) scans and fMRI (functional magnetic resonance imaging) techniques reveal an interesting phenomenon: the brains of children with ADHD show a remarkable lack of activity in at least two right hemisphere regions (remember that the right hemisphere perceives melodies and harmonies, bathes in the lushness of rich overtones and analyzes the vowel sounds of language). This research presents us with another possibility: the lack of activity in these areas of the auditory cortex prevents the ADHD child or adult from experiencing the macrocosm of his world. Instead of integration, the ADHD-affected person experiences a fragmented world, unable to discriminate between incoming stimuli.

So what musical prescription might be written for you or your child? Here are a few suggestions:

· High pitches (within reason) feed the brain; low pitches dispirit it. Listen to music with instruments or voices that spin pleasing overtones (flutes, violins, acoustic guitars, pianos and some singers) in any style that attracts you.

· 85 percent of our primary auditory cortex (where *all* sound is initially processed) exhibits a phenomenon known as "habituation." Any unrelenting sound causes us to deafen to it (notice how your attention is drawn to the cessation of sound from a noisy refrigerator or the times when crickets abruptly stop their chanting). Since the brain craves change, listen to music that contains alterations of rhythm, volume and pitch. (My apologies to rock, funk, heavy metal and rap musicians: you may have noble intentions but your music may be harmful to our health).

· Sing whenever and wherever possible, and teach your children to sing. Encourage them to use their voices and to listen to those voices, for they can be healing themselves at every moment.

· Avoid listening to extremely fast music, especially if it is correspondingly loud and insistent.

· Much has been said about the music of Mozart and its effect on listeners. But many other composers provoke the same curative benefits, from the Beatles to Duke Ellington's orchestra to Ravi Shankar, Ravel and Debussy, the rags of Scott Joplin, Gershwin and Berlin songs, and the electronic possibilities of the Moog synthesizer. Don't limit your choices by listening to other people's prejudices; find your own sound and then expand upon it.

· Music generates emotion, so be intentional about your options. Do you want to reinforce, deepen or prolong a current emotion? Or might it be healthier to shift sounds and possibly shift emotions?

· Excellent and affordable home listening programs are available to enhance concentration, spawn new neural pathways, and promote both relaxation and aural learning. A group centered at the National Academy for Child Development, a clinic that has been treating children and adolescents with neurological disabilities for over thirty years, created the best of these. Visit Advanced Brain Technologies at www.advancedbrain.com, contact them at 801.622.5676 or write to ABT at P.O. Box 1088, Ogden, UT 84401.

· Well-crafted music written by trained composers and performed by artists allows your brain to be drawn to the intensity of contrast, anticipation, withholding, satisfaction and release. Skip the junk and stick with the pros.

· Use music the way Michelangelo used his chisel on a piece of marble: rather than carving the stone to shape a figure, he simply freed the perfect form that already resided within the stone.

· Remembering that our brains process *every* sound within our range of hearing, avoid music that approaches or exceeds uncomfortable decibel limits (this is good advice for all living creatures).

· It has been medically proven that music can affect physiological parameters like blood pressure, heart rate, salivation, skin humidity, blood levels of stress hormones, sleeplessness or wakefulness. Decide whether you want to experience these changes in body function by monitoring your feelings carefully, and then choose music which agrees with your body.

· Earphones may focus attention on the music being listened to, but it also separates the listener from her environment. Decide why you may want to withdraw from your milieu before escaping it.

·Ounce for ounce, brain tissue is the third most consumptive of energy in the entire body (after the heart and the kidneys). The average human brain burns 22 percent of your total caloric intake. A healthy diet of music and food can boost energy levels, improve self-esteem, balance emotions and amplify personal attraction, with all of these factors existing while your body assumes a more vital look. Music is truly food for thought.

Mindful music and sound facilitate the growing of healthier brains, and both can be used to heal scars that have appeared during the course of our lifetimes. Music cannot cure ADHD, nor can residential treatment programs, psychopharmacological concoctions, biofeedback, acupuncture, behavior modification or a host of avowed curatives. Many of us hope, work and pray for a chemical or a preventive measure or a tonic which will bring greater relief to the millions of children, adolescents and adults whose lives are altered by this disruptive disorder. In the interim—as the neurologists, chemists, geneticists, psychiatrists and cytologists search through micro space probing for clues—simply push the button on your CD player and set a bit of healing into motion. Or howl at the moon.

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