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Sound Healing: Can you Drum your way to Better Health? Sing your way to Serenity? Tune up your Immunity with a Tuning Fork? Science takes a Surprising Look at the Restorative Powers of Chant, Rhythm and Music

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As you read this, a black hole about 2.5 billion years old is humming the deepest musical note ever created: a B-flat that's a million billion times deeper than your ear can hear. This stellar cantata comes from vibrating gasses in a galaxy known as the Perseus cluster, 250 million light-years away. At the same time, a yeast cell in a research laboratory is emitting high-pitched clicks: Jim Gimzewski, professor of chemistry at the University of California at Los Angeles, is using an atomic force microscope and computer imaging to record the motion of cell membranes, which can then be listened to. Gimzewski calls the process sonocytology, and believes it may one day allow scientists to distinguish healthy from unhealthy cells.

From stars to cells, dolphins to crickets, birds and bees to human beings, the universe is alive with melody, sending and receiving waves of sound. Scientists now realize that something so omnipresent and so fundamental has a powerful influence on everything we think and feel.

This dawning awareness had turned into a grassroots movement of sound healing, a kind of "tuning in and tuning up." On Yahoo!, for instance, there are some 80 groups devoted to music therapy and 90 groups dedicated to drum circles. In 2002, the first International Sound Symposium was held in San Jose, bringing together experts in fields such as "overtone chanting" and "psycho-acoustics." Sound healing CDs have been produced by specialists like Andrew Weil, M.D., founder of the Program in Integrative Medicine at the University of Arizona, and Mitchell Gaynor, M.D., founder and president of Gaynor Integrative Oncology in New York City.

Over the past few decades, music therapy has secured a legitimate place in the healing arts, and the practice continues to grow. More than 70 colleges and universities have degree programs approved by the American Music Therapy Association, and over 3,800 music therapists in the U.S. are board-certified

The Gathering Evidence

Body rhythms can be hastened or decelerated by music. Listening to Pachelbel's Canon, for instance, with its rhythm of about 60 beats a minute, slows breathing and heart rate through a process called entrainment, which is the tendency for two oscillating bodies to lock into phase so that they vibrate in harmony. It's the same

phenomenon that causes swinging pendulums to synchronize when they are close together, or that causes a tuning fork to vibrate sympathetically when another tuning fork of the same pitch is struck. Conversely, syncopation, which occurs when a beat comes in just ahead of your expectation, is experienced as exciting and physically stimulating; it's often used in dance music and drumming ceremonies.

Blood flow within the brain also appears to vary according to the sounds heard. Brain scans using Doppler sonography, conducted in 1999 in Germany at the University of Munster and the University of Dortmund, found that when non-musicians listened to music, the blood flow to the right hemisphere increased. But recordings with very strong rhythms, such as rock music, increased the blood flow in both hemispheres, suggesting that rhythm and pitch are processed in different parts of the brain.

Investigators observed that melody appears to act on the brain's emotional core, the limbic system, which moves us to joy, awe, peace, fear and sadness. Researchers at Cornell University looked at physiological changes in volunteers as they listened to music, and found that the clichés hold true: Music with rapid tempos in major keys correlated with happiness, while slow tempos and minor keys triggered melancholy.

#### How Sound Moves Us

The effects of music have been noted for millennia. David played his harp to lift King Saul's depression, and Alexander the Great was restored to sanity by the music of a lyre. In the Himalayas, sacred healing chants have been performed daily by Buddhist monks for over 2,000 years. Yet only recently have researchers begun to understand how sound moves body and soul.

Peter Janata, Ph.D., a neuroscientist at Dartmouth College, mapped the brains of people as they listened to a melody that moved through all the major and minor keys. In addition to activity in the temporal lobe, which is involved in the basic processing of all sounds, Janata found that a region just behind the forehead (called the rostromedial prefrontal cortex) responded according to specific keys in the melody. Interestingly, this region is linked to memory and emotions.

"Music is not necessary for survival, yet something inside us craves it," says Janata. Even deaf people sense vibration in the part of the brain that is normally used for hearing, according to research from the University of Rochester School of Medicine.

Studies on music's health benefits are intriguing, though still preliminary. A single, 30-minute music-therapy session boosts immune function and increases salivary IgA (an immunoglobulin), according to Deforia Lane, Ph.D., resident director of music therapy at the University Hospitals of Cleveland in Ohio. However, it's unclear how long those levels stay elevated or how much of the effect is due to the music therapist's presence and care.

A study conducted in a newborn intensive-care unit found that playing lullabies with a heartbeat can be so beneficial to premature infants that they are discharged as much as

two weeks earlier than babies who aren't serenaded. Taped sounds from within the womb combined with song also significantly increased oxygen saturation in premature infants, according to researchers at Georgia Baptist Medical Center.

Rhythmic music with a strong beat has proven surprisingly powerful in treating people with neurological disorders such as stroke, cerebral palsy or Parkinson's disease. Michael Thaut, Ph.D., director of the Center for Biomedical Research in Music at Colorado State University in Fort Collins, and his colleagues found that people with Parkinson's disease who received three weeks of conventional therapy improved walking speed by about 10 percent, but walking speed improved by 25 percent when rhythmic music accompanied therapy.

"Music has a profound facilitating effect on the gait of these patients," says Thaut, who is also professor of music and neuroscience at CSU. "We see improvements in speed, symmetry and muscle activation." The intervals and durations of rhythm communicate timing, he adds, which influences firing patterns in the brain. Simple, strong rhythms, such as a 4/4 beat, are best used to improve gait.

Music therapy is also beneficial to people undergoing medical procedures, according to O.J. Sahler, M.D., professor of pediatrics at the University of Rochester in New York. Twice a week, Sahler and his colleagues provided 45-minute music-assisted relaxation imagery sessions to people undergoing bone marrow transplants. The music was chosen by the therapist and depended in part on the person's preference.

"We measured days to engraftment," says Sahler. "That's the length of time it takes to begin producing white blood cells. On average, those who received music therapy engrafted two days earlier than those who didn't have the therapy. This is very significant, since that period of time is one in which people are highly susceptible to infection."

Sahler plans to follow up with a larger study of 400 patients at several hospitals that will contrast sessions of "reflective listening" with music therapy to ascertain how much of the beneficial impact is simply the presence of a caring individual in the room.

### Bowls that Sing

"I was transfixed," recalls San Diego sound healer Elivia Melodey of the first time she heard a quartz crystal "singing" bowl. "The sound literally picked me up and took me somewhere else. It felt like every cell in my being moved."

The bowls are made of silicon sand heated to 4,200 degrees, resulting in 99.9 percent pure quartz. When a suede or rubber mallet is run around the edge of the bowl, its sides invisibly flex, creating deep, resonant tones. Bowls range in size and design. Some are as big as 2 feet in diameter; others are small and handheld, with materials such as gold, rose quartz or platinum added in. When the larger bowls are activated, you can feel the hum vibrating through your body.

"I use a combination of crystal bowls and chanting with my patients," explains oncologist Mitchell Gaynor, author of *The Healing Power of Sound*. Chanting changes breathing and emotional states, and adding the tones of the crystal bowl to the mix creates a "powerful healing tool," says Gaynor, who holds a sound meditation for his cancer patients twice monthly.

Richard Peery, of Trenton, N.J., suffers chronic back pain. His doctor, Patrice Graham, M.D., a pain specialist who is board-certified in physical medicine and rehabilitation, notes that the sense of relaxation and joy Peery experienced when he began working with the bowls had a profound physical effect. "He managed his low-back pain with a minimum of medication and no longer requires physical therapy," says Graham. "He turned a corner when he found the bowls."

The bowls can help with emotional issues as well. Andrew Wald, a therapist in Bethesda, Md., who specializes in couples work, plays a crystal bowl before sessions begin. "It creates a more open, less defensive mood," he notes. "I sit the couple across from each other, have them close their eyes and sometimes touch hands, and become aware of the connection between them as they listen to the sound."

Other resonant devices like chimes, tuning forks and gongs are utilized by professionals. Kristine Theurer, a music therapist in Vancouver, British Columbia, has found that people with Alzheimer's disease, no matter their cognitive defects, are able to play together in hand-chime choirs. Though language and memory skills fail in Alzheimer's patients, the ability to respond to rhythm and melody remains robust until late in the disease. In fact, structured music programs seem to calm people with Alzheimer's, improving their mood and sleep, according to research at the University of Miami School of Medicine.

### Drumming up Immunity

Drumming circles are cropping up in cities and towns all over America, bringing groups small and large together to beat ancestral rhythms and dance. "Today's drummers are rediscovering the ecstatic side of drumming," says Michael Drake, a Topeka, Kan.-based ceremonial drummer of Cherokee descent and author of *The Shamanic Drum*.

Chicago music therapist Louise Dimiceli-Mitran has used drumming in her healing work at Advocate Illinois Masonic Medical Center. "When you're in a drumming circle it's as if all your body is in tune with a rhythmic orchestra," she says.

Drumming in groups can boost the immune system, according to a study involving more than 100 participants and published in the journal *Alternative Therapies*. According to study leader Barry Bittman, M.D., director of Meadville Medical Center's Mind-Body Wellness Center in Pennsylvania, an increased number of infection-fighting immune cells was found in the drummers' bloodstream. The drummers also had an improved ratio of dehydroepiandrosterone (DHEA) to cortisol, a hormone balance that is beneficial to immune function. A control group that simply listened to

drumming but did not participate had no change in either measure.

Changes in these immunity markers might be attributed to the stress-reducing benefits of self-expression and camaraderie as well as the rhythm of the drumbeat, speculates Bittman. The group began their session by passing hollow, bead-filled "shaker eggs" around a circle, faster and faster until the eggs dropped to the floor. This created a light, playful mood, which was followed by participants playing drums in rhythm with the syllables of their own names. Then the group drummed together in various tempos, and finally spent 30 minutes drumming to guided imagery.

One of the most unique aspects of a drumming circle is the connectedness it creates. "The community aspect is just as important as the drumming" notes Mark Testa, a Boulder, Colo.-based chiropractor who holds drumming circles.

The Human Instrument