

# Music as medicine

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**By Carol M. Ostrom**  
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Look up "music and healing" and you'll likely hit Web sites in shades of purple, festooned with stars and chat about crystals and other alternative therapies.

Increasingly, though, you'll likely also find some distinctly *non woo-woo* information sources that cater to those inclined to the scientific method.

Of course, it doesn't take a rocket scientist to figure out that music can make you feel good.

But it does take some rigorous science to figure out whether that "feel good" can be measured. And then, science wants to know: Do those measures correlate with any health benefit? Help you heal? Lessen post-surgery nausea and pain? Trigger enough optimism to get you into a post-heart-attack exercise routine?

In the past, music, like clean air or exercise, seemed somehow too ubiquitous or natural to warrant serious study as a health benefit.

Today, new interest in alternative therapies, combined with advances in "cognitive neuroscience" and tools such as the functional MRI, which lets researchers track the brain's blood flow related to mental activities, has spurred researchers to take a closer look at music's neurological effects.

## We're hardwired for music

At Harvard Medical School's Institute for Music and Brain Science, researchers are studying the effects of music on pain and stress in premature infants, measuring heart rate, oxygenation and respiratory rate.

"What evidence we have in hand really does show that music makes a difference," says the institute's director, Dr. Mark Jude Tramo, a practicing neurologist. But, he adds, there are many questions yet to answer.

Some studies show music can reduce the need for blood-pressure medications after heart surgery and help babies in the neonatal intensive care unit (ICU) gain weight, he says.

## Listen

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 Listen to an audio clip of "Secret Path" from Niels Eje's "Fairy Tales." (:30, MP3)

For Tramo, such studies separate hype from science. "It's not going to be that music shrinks your tumor,

## Lecture coming to Seattle

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**"Music and the Brain: The Inside Story** — the Cognitive Neuroscience Aspects of Music." Information: Call Ani O'Hara, Swedish Medical Center, 206-386-3712.

## Music and health

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### The Power of Music

**report:** [www.thepowerofmusic.co.uk](http://www.thepowerofmusic.co.uk) Contains mini-reviews of more than 200 studies, articles and books looking at music's physiological, psychological and emotional effects.

**AMTA** (American Music Therapy Association): <http://musictherapy.org>

**MuSICA** (Music and Science Information Computer Archive): [www.musica.uci.edu](http://www.musica.uci.edu)

**The Institute** for Music & Brain Science at Harvard-affiliated Massachusetts General Hospital: [www.brainmusic.org](http://www.brainmusic.org)

makes your infection go away," he says.

But our brains are hardwired for music, he says, and our brains' complex response to it might play an important adjunct role in health. For example, by reducing the "acoustic graffiti" that permeates hospitals, music might help reduce fear and anxiety that can hamper healing.

Still, "the cold, hard, randomized multi-center large population, statistically sound clinical trials — that's what's lacking," Tramo says.

"The question a lot of us are grappling with is: Is music a vehicle for a number of things that can make people feel better, such as interpersonal relations or getting rid of (the noise of) beepers and alarms, or is there something inherently in music that has a healing effect?"

### **Musical pillows**

A study of music's effect on patients is under way at one very high-tech area at Seattle's Northwest Hospital & Medical Center: the Heart Catheterization Laboratory. Here, amid imaging equipment and monitors, randomly selected patients listen through a specially designed pillow to the sounds of oboe, harp and cello, along with bird songs and waterfalls.

In the cath lab, patients are awake as doctors push a long, thin catheter through an artery, typically reached by an incision in the groin. Dye is injected and tracked to show blockages.

Afterward, patients will be asked a series of questions: What sounds did they notice? How do they rate the lab's sound environment? How high was their anxiety during the procedure?

The study also is being conducted at hospitals in Denmark and Canada.

Dr. Per Thorgaard, study organizer and chief physician of anesthesia and intensive care at Aalborg University Hospital in Aalborg, Denmark, says about 400 patients will participate in this study, one of a series he hopes will lead to research into music's role in long-term healing.

The study is one of several Thorgaard has conducted since 1998, when he became concerned that the constant, unfamiliar beeps, whirrs and alarms in intensive-care units were confusing and distressing to patients. "The patient who is in the midst of this chaos gets bombarded, and they can't stand it; they get agitated, psychotic; it develops within a couple of days," he says.

Thorgaard looked for studies about whether music could help patients tune out the environment, but found little of use. He found even less on what kind of music might be best.

"We guessed it should not be Jimi Hendrix or Pearl Jam," he quips. After testing classical composers, he settled on the popular Danish composer Niels Eje.

Thorgaard and his colleagues tested the music on patients, asking them to rate their experience of comfort and pain after leaving the ICU. Music, they found, "was like the best medication we had in the pharmacy."

### **"Really soothing"**

Last month, Janice Johnson was at Northwest for a second heart catheterization and procedure to unblock an artery. The first time, last year, she was tense and stayed that way. Last month, she was tense — until the music began.

"It was such a relaxing piece of music that you just went somewhere else," says Johnson, who found herself transported to a Japanese garden, where the sound of a waterfall transfixed her. She lost track of what was

going on in the cath lab — including her back pain, which was worse lying flat, as she had to do on the procedure table. "The music was really soothing," she says.

The operating room is an "ominous, stark, foreign environment, kind of scary," says Robert Loveland, a retired construction manager who also listened to music during his heart catheterization last month. "You've got four or five, maybe six people circling you in a place that's very foreign to you — it's very unsettling."

Loveland, 66, hopes Northwest makes music a regular feature in the cath lab or other areas where patients are awake during procedures.

### **Skeptical doctors**

At first, some of the doctors at Northwest were skeptical.

"In medical school, when I trained in the 1980s, the focus was really on science and less on personal issues such as comfort and emotional states of mind and well-being," says Dr. Gary Weeks, a cardiologist. "It's only when you get out in the practice of medicine that you realize that the emotional and non-physical aspects impact the patient's sense of health and well-being."

Studies have shown music can lower blood pressure and heart rate, as well as levels of stress. One, published in 2003 in *Annals of the New York Academy of Sciences*, showed that relaxing music after a psychologically stressful task stopped the increase of cortisol, a stress hormone, whereas in silence, the hormone continued to increase for 30 minutes.

Other small studies suggest links with heart rates, blood pressure, respiration, muscle tension, motor responses and skin temperature.

Weeks sees a connection. "If a patient leaves the procedure feeling less stressed and more self-confident, they will be more likely to return to a higher level of activity," he says.

"We need to attend to emotional health and not focus solely on fixing plumbing. ... If you only fix the problem but fail to deal with their anxieties, their worries and fears, their sense of frailty — their sense of being at risk — they'll continue to have symptoms of serious illness."

Dr. William Nichols, an anesthesiologist who also works in Northwest's cath lab, says he's intrigued that music appears to reduce post-operative nausea and pain in some people.

### **Likes the odds**

Looking at "risk" vs. "benefit," he sees an equation he likes: "Nobody has had an allergic reaction to music yet, as far as I know," he says.

For Nichols, it helps that Thorgaard has an international reputation. "He's the big cheese," he says. "Having a

### **Prescription: Music**

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**Take advantage** of music's ability to change your mood. Try to notice what kind of music helps brighten your spirits, what kind helps you feel relaxed.

**Experiment** — but don't underestimate the power of music you grew up with. You might never listen to the music you remember from your childhood, but it might be comforting under some circumstances. On the other hand, maybe "new-age" music never occurs to you, but it might prove relaxing. You can check out CDs at the Seattle Public Library to try before you buy.

**Practice relaxing to music.** A daily 20-minute session with music — and no phones, TV or other distractions — will help "train" your body to relax more quickly.

**If you're trying to sleep,** don't listen to words. Music without lyrics lets you turn off your "thinking" better, most experts believe.

**Match beats** to the tempo you want for your activity. At least one small study showed that cancer patients' heartbeats synchronized with a musical beat, with a bit of training. So if you want to work hard, look for fast beats; if you want to relax, don't reach for the rock 'n' roll. Some music experts advise counting beats in the music to help it do the job for you — 120 to 135 beats per minute for fast walking, 126 for step aerobics and 160 for jogging, for example. Dr. Michael Thaut, director of the Center for Biomedical Research in Music at Colorado State University, says rhythm can modulate the timing of firing patterns of neurons in the brain.

guy who is an intensivist, an M.D. doing real research on this, opens the door a lot for a guy like me. He understands science; he's not just a guy who showed up with magnets."

There are still plenty of unanswered questions. For example: Do patients in different cultures react differently to music? Might the type of music greatly influence a patient's reaction? Could that vary from patient to patient? Since patients know they're hearing music, how do researchers control for the "placebo effect?"

### **The slow slog of science**

Like most scientific endeavors, research on music's physiological and psychological effects is proceeding slowly. But intriguing bits of information have been piling up as scientists gain the ability to look more closely at the brain.

Dr. Michael Thaut, director of the Center for Biomedical Research in Music at Colorado State University, says studies, including his 10 peer-reviewed, "major research" papers on patients who have had strokes or Parkinson's disease, show the music and healing connection "is not a fluke or a curious one-time observation, but a stable biological phenomenon."

Music is a "rich" medium to study, Tramo believes, because scientists can get at the "physics" of music, breaking it down into discrete features.

"If you want to understand the human condition, you can't ignore something as essential to it as music," Tramo says.

"If we can understand how it is that music communicates emotion and meaning, if we can understand all the computations the brain has to do to recognize that you're hearing the same melody in a different key ... we're getting fundamental information on how the brain works."

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### **Listen to the music**

**Sound snippet** of Niels Eje's "Fairy Tales," a production of MusiCure in collaboration with the Musica Humana project. This is the music used in the Northwest Hospital

Experiment: <http://seattletimes.nwsourc.com/audio/news/health/secretpath.html>