

# Throbbing pain isn't a matter of the heart, researchers find

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(Medical Xpress)—Throbbing pain may pound like a heartbeat, but University of Florida scientists have discovered the sensation is all in your head, or more precisely, in your brain waves.

The finding could drastically change how researchers look for therapies that can ease pain, said Dr. Andrew Ahn, a [neurologist](#) at the UF College of Medicine, a part of UF Health. Ahn and his colleagues reported their findings in the July issue of the journal *Pain*.

"Aristotle linked throbbing pain to heart rhythm 2,300 years ago," Ahn said. "It took two millennia to discover that his presumption was wrong."

People who have experienced a [toothache](#) or a migraine—or even just hit their shin on the coffee table—may have noted a throbbing quality to the pain that physicians have long associated with arterial [pulsations](#) at the location of the injury. Some medicines even constricted [blood vessel walls](#) in hopes of lessening the effect.

"Current therapies for pain do not adequately relieve pain and have serious negative side effects, so we thought that by examining this experience more closely we could find clues that would lead us to improved therapies to help people who suffer from pain," Ahn said. "It turns out that we have been looking in the wrong place all along."

Ahn and his colleagues had previously examined the pulsations associated with throbbing pain while monitoring [heart rate](#) and found the

two were not linked. This observation can be verified by almost anyone experiencing throbbing pain, by comparing their throbbing experience with their own pulse. At the time, researchers did not have an alternative explanation for the origin of the throbbing quality of pain, but this current case study reveals new answers.

Ahn and his colleagues Jue Mo and Mingzhou Ding in the UF College of Engineering along with Morris Maizels of the Blue Ridge Headache Center in Asheville, N.C., examined a patient who had a throbbing sensation that remained even after her chronic migraine headaches had resolved. They simultaneously recorded the patient's sensation of the throbbing pain and her arterial pulse and found that they differed from one another, indicating that the pulsing of blood from the heartbeat was unrelated to the throbbing quality of pain.

However, through the use of an electroencephalogram, they found that the throbbing quality was correlated with a type of brain activity called alpha waves.

"We understand very little about alpha waves, but they appear to have an important role in attention and how we experience the world," Ahn said. "In addition, by analogy to how a radio works, alpha waves may also act as a carrier signal that allows different parts of the brain to communicate with itself."

What scientists don't know yet is exactly how [alpha waves](#) cause throbbing pain. But the current findings indicate that the experience of pain is linked more to how the brain works and not to the pulsations of blood at the location of the pain. Understanding this will allow researchers to design new studies to discover better treatments for pain, Ahn said.

Provided by University of Florida

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