

How David Blaine Held His Breath

Thursday, May. 01, 2008 By [TIFFANY SHARPLES](#)



David Blaine sits atop a sphere where he set a new world record for breath-holding, Wednesday, April 30, 2008, at 17 minutes and 4.4 seconds, during a live telecast of "The Oprah Winfrey Show," in Chicago.

George Burns / Harpo Productions

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For most non-medical people, the term "apnea" is most familiar when coupled with the word "sleep," and refers to a dangerous condition in which people inadvertently stop breathing while asleep. But the word literally means a temporary cessation of breathing and it is practiced (on purpose) around the world by an international community of extreme athletes — a brotherhood that now includes magician and stuntman David Blaine. On the set of *The Oprah Winfrey Show* on April 30, Blaine broke the world record by holding his breath for 17 minutes and 4 seconds — proving that just how temporary apnea can be is a question of training, endurance and will.

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Master stuntman David Blaine set a world record Wednesday by holding his breath for 17 minutes at a live taping of *The Oprah Winfrey Show*. *TIME* asked Blaine to rate the difficulty of this and his previous stunts on a 1-10 scale

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An average person in good health can hold their breath for about two minutes, but with even small amounts of practice it is possible to increase that time dramatically. "The body can be trained," explains Dr. Ralph Potkin, a pulmonary specialist who worked with Blaine in the weeks leading up to his recent feat.

When you deprive your body of oxygen, it is only a matter of time before your carbon dioxide levels build, triggering a reflex that will cause your breathing muscles — including the diaphragm and the muscles between the ribs — to spasm. The pain of these spasms is what causes most people to gulp for breath after just a couple of minutes. When holding your breath underwater, however, you have a bit of mammalian evolution on your side. When humans are submerged in cold water, our bodies instinctively prepare to conserve oxygen, much in the way that dolphins' and whales' bodies do when they dive. "Heart rate drops, blood pressure goes up and circulation gets redistributed," Potkin says. The body's focus becomes getting the oxygenated blood primarily to the vital organs — the brain and the heart — and not the extremities or abdomen.

This reflex can help us conserve the oxygen we do have, but it doesn't do much for the painful muscle spasms. Overcoming those is a matter of concentration and meditation. "This is one of those Zen sports," Potkin explains.

Suppressing the powerful pain impulse too successfully can prove deadly: subjects can continue holding their breath up to the point that their brains shut down from lack of oxygen. If you're 100 feet under water — or even three feet underwater in a pool — it's not a good time to pass out. In order to break the world record, Blaine had to hold his breath without fainting. (Had he continued until he'd depleted his brain's oxygen, however, Potkin is convinced he could have gone for another full minute.)

That of course, is down to months of rigorous training, including practicing a technique called glossopharyngeal insufflation, or lung packing. In order to maximize the amount of air taken into the lungs before apnea, Blaine, among other divers, inhaled until his lungs were filled to their physiological capacity, and then forced additional air into the lungs by swallowing, hard. Using this technique, Blaine was able to cram another quart's worth of air into his already full lungs, Potkin estimates. (He also fasted before before the actual record breaking act, in order to have more room for his lungs to expand without bumping up against a full stomach.) In a study of five elite free divers, who descend to scuba-diving depths without the aid of equipment, Potkin found that the lung packing was "associated with deeper dives and longer holding times."

Of course, another factor associated with longer holding times is the consumption of pure oxygen beforehand. The world record for holding your breath after inhaling pure oxygen is now Blaine's — 17 minutes and 4 seconds. The record without the pure oxygen, which Blaine failed to break during an attempt last year in Manhattan's Lincoln Center, is 8 minutes and 58 seconds.

With or without pure oxygen, holding your breath is a difficult and dangerous pastime even for elite athletes. When not done carefully, it can lead to drowning, or to potential tissue damage in the heart, brains or lungs. Preliminary results from Potkin's research into apnea's long-term effects show some abnormal brain scans among young, extreme free divers. There's still much to learn about the phenomenon; as a medical student, Potkin recalls, he was told that no one could hold his breath for more than five minutes without suffering brain damage. Now, he wants to see if the technique can be used for medical purposes — and he's hoping Blaine's latest stunt provides the impetus for a greater scientific understanding of how to hold one's breath.