



ARE NURSING HOME COSTS BREAKING THE BANK?



New research offers new insights on black bear hibernation

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LOS ANGELES — Black bears have a method of hibernation previously unobserved in any mammal, researchers reported Thursday.

Although their body temperature drops only about 10 degrees Fahrenheit, their metabolism falls by more than 75 percent, allowing them to sleep through the winter without eating, drinking, urinating or defecating, researchers reported in the journal Science.

Previous research had indicated that the bears' temperature did not fall like that of other animals — which often drop near freezing — during their periods of winter quiescence, and many researchers had therefore argued that the animals do not really hibernate.

But the new data on metabolism "show that bears do indeed hibernate," wrote animal physiologist Gerhard Heldmaier of Philipps Universitaet in Marburg, Hessen, Germany, in an editorial accompanying the report.

The five black bears (*Ursus americanus*) in the study were so-called nuisance bears, captured because they kept nosing around too close to human communities. They were donated to the Institute of Arctic Biology, where they were fitted with transmitters to monitor heart rates and installed in isolated dens in the woods where oxygen intake and carbon dioxide output could be measured. Their activity was also monitored with infrared cameras.

"This required a unique facility," said biologist Brian A. Barnes, director of the University of Alaska's Institute of Arctic Biology and lead author of the report. "We found some surprises."

Typically, hibernating mammals lower their metabolism by about 50 percent for every 18-degree drop in body temperature. The bears, however, lower their metabolism 75 percent with only a 10-degree drop, and that drop isn't constant. After about seven days, Barnes said, they start to shiver and their body temperature goes up about 8 degrees, only to start dropping again.

These temperature cycles continue through the winter, but the bears' metabolism remains low during the whole period.

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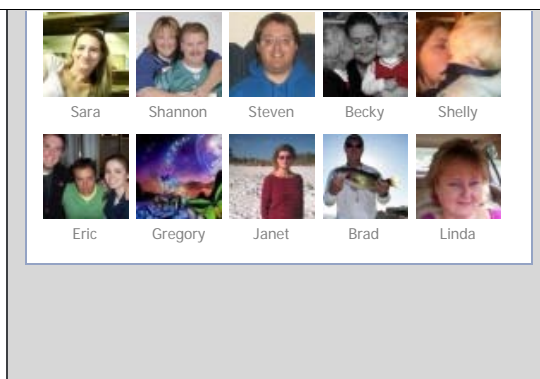
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When the bears emerged from their dens in mid-April, their body temperatures returned to normal and the researchers expected their metabolism to do the same. Intriguingly, metabolism remained at only about 50 percent of normal for nearly a month before finally returning to summertime levels, the researchers found. "That was very surprising," said co-author Oivind Toien of the Institute of Arctic Biology.

One of the female bears was pregnant when she entered hibernation, and her body temperature did not decrease. The fetus died, however, because of a congenital deformity, and after it was stillborn, the female's body assumed the same pattern as that of the other bears in the study.

If researchers could figure out how to trigger the condition in humans, experts said, it would provide a good way to preserve life following accidents or a medical emergency and, in the longer term, might make it easier for humans to endure long voyages in space.

Reducing metabolism following a heart attack or stroke might extend the "golden hour" for treatment to a "golden day" or even longer, Barnes said.



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