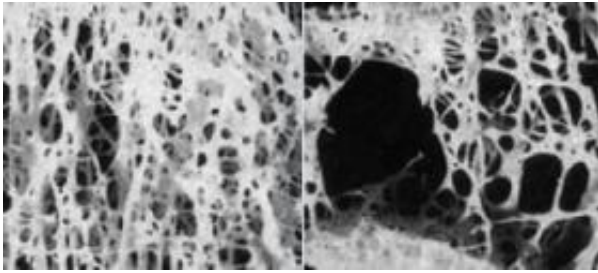
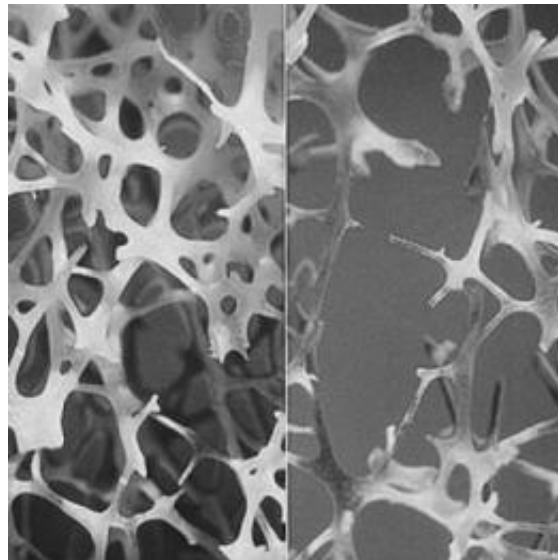


Building strong bones: Running may provide more benefits than resistance training

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On the left is normal bone and on the right is osteoporotic bone. Credit: International Osteoporosis Foundation



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Osteoporosis affects more than 200 million people worldwide and is a serious public health concern, according to the National Osteoporosis Foundation. Resistance training often is recommended to increase and prevent loss of bone mineral density (BMD), although previous studies that examined the effects of resistance training in men produced varied results. Now, in a new study, University of Missouri researchers have found that high-impact activities, such as running, might have a greater positive effect on BMD than resistance training.

"The results of the study confirm that both resistance training and high-impact endurance activities increase bone mineral density. However, high-impact sports, like running, appear to have a greater beneficial effect," said Pam Hinton, associate professor in the Department of Nutrition and Exercise Physiology in the MU College of Human Environmental Sciences.

According to the researchers, the true effects of weight-bearing or resistance exercise are only apparent when controlling for differences in body weight or composition. People who primarily perform non weight-bearing activities will benefit from resistance training that increases lean body mass, Hinton said. People who engage in activities, such as cycling, swimming, or rowing, should add bone-strengthening activities, such as resistance training or running, to their exercise regimens.

"Exercise programs to increase bone strength should be designed using what is known about how bones respond to exercise," Hinton said. "Only the skeletal sites that experience increased stress from exercise will become stronger. For example, performing upper body resistance exercises will not increase bone mineral density of the hips. The response of bone to loading is determined by the magnitude of the force, and the rate and

direction(s) at which it is applied. Therefore, high-impact, dynamic, multi-directional activities, including structured jump-training (plyometrics), result in greater gains in bone strength. Playing basketball, volleyball, or soccer are also good options."

In the study, the researchers determined the effects of long-term running, cycling, and resistance training on whole-body and regional BMD, taking into account the effects of body weight and composition, in men ages 19 to 45. After adjusting for differences in lean body mass, the researchers found that runners had greater spine BMD than cyclists. Lean body mass was positively associated with BMD in both resistance-trained individuals and cyclists but not in runners; therefore, high-impact activity may override the benefits of lean body mass on BMD, Hinton said.

More information: The study, "Lean body mass and weight-bearing activity in the prediction of bone mineral density in physically active men," was published in the February issue of the *Journal of Strength Conditioning*.

Source: University of Missouri-Columbia

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