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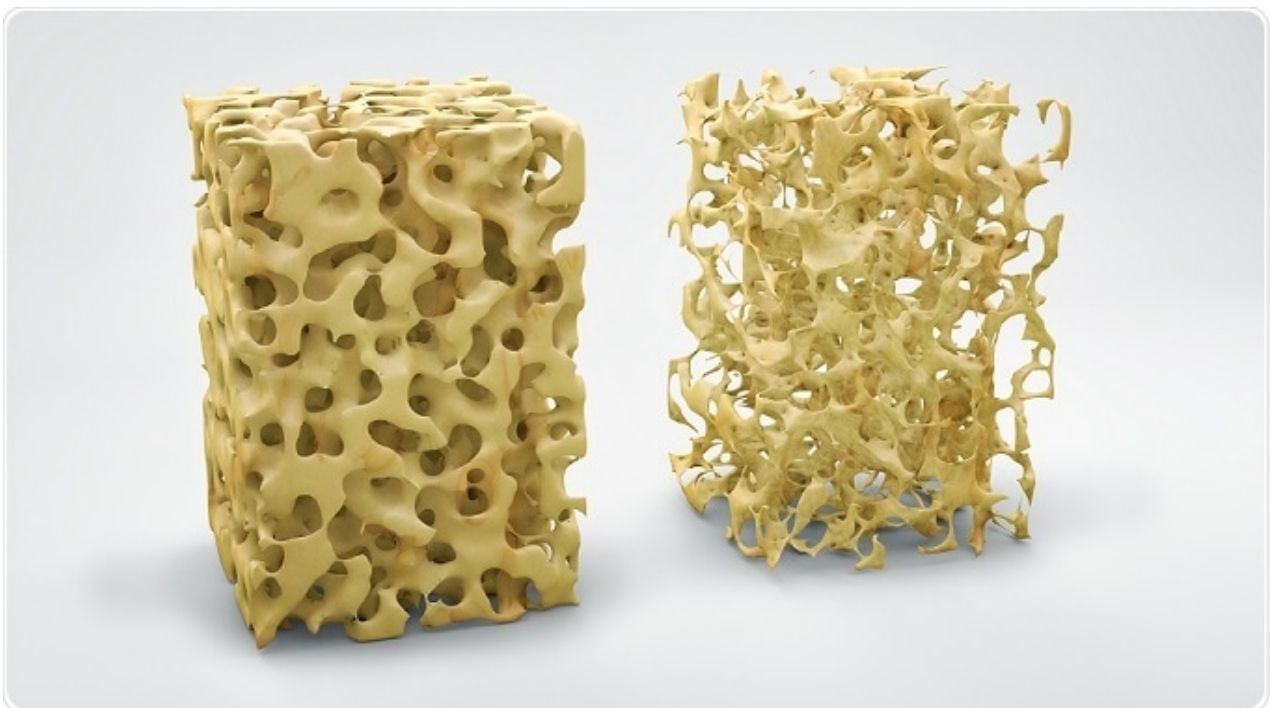
Air pollution may exacerbate osteoporosis



By Kate Bass, BSc

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Based on a study of nine million people, researchers at Columbia University's Mailman School of Public Health People report that people living amidst high levels of air pollution are more likely to suffer bone fractures from osteoporosis than those living in areas with less pollution.



Bone structure 3d illustration, normal and with osteoporosis. Credit: adike/Shutterstock.com

Osteoporosis is a disease in which the body cannot produce bone as rapidly as it is lost. This reduces the density and quality of bone, making it more fragile and more susceptible to breaking. It does not have any symptoms before a break occurs as the result of a usually harmless impact, such as a hug. Osteoporosis can occur secondary to a range of disorders, including rheumatoid arthritis, multiple sclerosis and several forms of cancer, but can also arise as part of the aging process.

Osteoporosis is the most common reason for fractures among the elderly. It is estimated that every year there are two million osteoporosis-related bone fractures in the US, which impose annual health costs totalling \$20 billion. Fractures are a serious event among the elderly; in addition to commonly

bringing the end to independent living, they increase the risk of death by up to 20%.

Researchers at Columbia University's Mailman School of Public Health conducted a study of over nine million patients from Northeast/Mid-Atlantic admitted to hospital with an osteoporosis-related fracture between 2003 and 2010. They found that the risk of osteoporotic fractures was linked to exposure to air pollution. Even a slight increase in ambient particulate matter was associated with a higher rate of hospital admissions for osteoporosis-related bone fractures.

Further analysis revealed that, compared with patients from low-pollution areas, patients living in areas with higher levels of particulate matter and black carbon had lower levels of the hormone that regulates calcium levels in the blood and bone remodelling— parathyroid hormone—and this resulted in a reduction in bone mineral density.

In addition it is possible that particulate matter, which is known to cause systemic oxidative damage and inflammation, could accelerate bone loss and increase the risk of bone fractures in older individuals. Smoking, which contains several particulate matter components, has been consistently shown to be linked with bone damage.

Andrea Baccarelli, chair of Environmental Health Sciences at the Mailman School commented "Decades of careful research has documented the health risks of air pollution, from cardiovascular and respiratory diseases, to cancer, and impaired cognition, and now osteoporosis. Among the many benefits of clean air, our research suggests, are improved bone health and a way to prevent bone fractures."

Source:

- Columbia University's Mailman School of Public Health Press Release 9 November 2017. Available at https://eurekaalert.org/pub_releases/2017-11/cums-bbo110617.php
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