

Men who are taller in young adulthood, as an indicator of early-life circumstances, may have a lower risk of dementia in old age, suggests a study published in eLife.

Sitting for eight hours a day linked to a higher risk of depression



personneltoday.com

Spending hours a day sitting down has been linked to a higher risk of depression, a UK study has found. So there's another bit of motivation to get up for a few minutes and stretch your legs — in case the office worker of the future or the threat of early death wasn't scary enough.

Researchers at University College London found that adolescents who spend large portions of the day sitting have a greater risk of developing depression by the time they reach adulthood. The team analyzed data on 4,257 teenagers who were taking part in the University of Bristol's Children of the 90s study, metro.co.uk reported.

The participants had their movement tracked for at least ten hours over at least three days at ages 12, 14, and 16, using a worn accelerometer. They also answered a questionnaire measuring their symptoms of depression, such as low mood

and poor concentration. Researchers found that between the ages of 12 and 16, physical activity declined while time spent sedentarily increased, going from an average of seven hours to eight hours and 45 minutes. For every additional hour spent sitting down per day, the participants' depression score rose by up to 11.1 percent by age 18. Those who spent consistently high amounts of time sedentary at all three ages had 28.2 percent higher depression scores by age 18 than those who were rarely sedentary. The good news is that high levels of light activity seems to help things. Depression scores were 19.6 percent lower in participants with consistently high levels of light activity.

Every additional hour of light physical activity per day at age 12, 14 and 16 was associated with depression scores at age 18 that were 9.6 percent, 7.8 percent and 11.1 percent lower, respectively. Of

course, it's worth noting that the study shows a link between sedentary behavior and depressive symptoms, not a cause and effect relationship. It's far easier to get up and go out when you're not experiencing depression, and while we know that exercise can help our mental health, struggling with depression can make getting active feel impossible.

More research is needed to look at the longterm effects of our increasingly sedentary lifestyles. But what we can learn from this is that reducing our time spent sitting down really is key. Lead author and UCL Psychiatry Ph.D student Aaron Kandola said: "Our findings show that young people who are inactive for large proportions of the day throughout adolescence face a greater risk of depression by age 18. "We found that it's not just more intense forms of activity that are good for our mental health, but any degree of physical activity that can reduce the

time we spend sitting down is likely to be beneficial.

"We should be encouraging people of all ages to move more, and to sit less, as it's good for both our physical and mental health. Worryingly, the amount of time that young people spend inactive has been steadily rising for years, but there has been a surprising lack of high-quality research into how this could affect mental health.

"The number of young people with depression also appears to be growing and our study suggests that these two trends may be linked."

The study's senior author, Dr. Joseph Hayes, from Camden and Islington NHS Foundation Trust, said: "Light activity could be particularly useful because it doesn't require much effort and it's easy to fit into the daily routines of most young people.

"Schools could integrate light activity into their pupils' days, such as with standing or active lessons."

Foot-and-mouth disease virus could help target deadly pancreatic cancer: Study

A virus that causes fever and blisters in cattle could hold the key to tackling the deadly pancreatic cancer, scientists say.

Researchers have developed "a promising new drug" that uses a protein present in the foot-and-mouth disease virus to kill off tumors in the pancreas, yahoo.com reported.

Scientists hope that the results of the study, published in the journal *Theranostics*, could pave the way for new treatments for the disease which causes around 9,200 deaths every year.

Commenting on the research, Dr. Emily Farthing, senior research information manager at Cancer Research UK, said: "This early-stage research has developed a promising new drug that reduces the growth of pancreatic tumors in the lab.

"And with further research to see if it's safe and effective for patients, we

tesirine, to target pancreatic cancer cells.

When mice with pancreatic cancer tumors were treated with the protein-drug combination, the tumors were completely killed.

The rodents that had AvB6-positive tumors were given a tiny dose of the protein-drug combination three times a week, which stopped the tumors growing completely.

But when the dose was increased and given twice a week, the researchers found all the tumors in mice were completely killed.

Professor John Marshall, from the Queen Mary University of London and the lead author on the study, said: "Foot-and-mouth disease virus uses AvB6 as a route to infect cattle, as the virus binds to this protein on a cow's tongue.

"By testing pieces of the protein in the virus that attaches to AvB6, we've developed a route to deliver a drug speci-



yahoo.com

hope that this could one day offer new hope for people with this disease."

Pancreatic cancer is the 11th most common cancer in the UK, according to Cancer Research UK.

Only one percent of people diagnosed with the disease are expected to survive for 10 years or more.

The researchers found that a protein fragment taken from the foot-and-mouth disease virus targets another protein, called AvB6, found on the surface of a majority of pancreatic cancer cells.

Working with drug companies AstraZeneca and ADC Therapeutics, the team combined the virus protein fragment with a highly potent drug, called

cally to pancreatic cancers."

The team also used the protein-drug combination on human cancer cells in the lab.

Some of these cells had AvB6 on their surface while others did not. The researchers found that cells with AvB6 responded well to the treatment, while the AvB6 negative cells needed much higher doses of the drug for the cells to be killed.

The team now plans to perform further protein-drug combination tests on mice before moving to clinical trials.

The research was funded by the UK national medical research charity Pancreatic Cancer Research Fund.

Vapers show chemical changes in their genome linked to cancer

Biologically important changes in DNA seen in smokers are also being found in people who vape, according to a new study published in the journal *Epigenetics*.

A team of scientists at the Keck School of Medicine of USC have found people who vape exhibit similar chemical modifications in their overall genome and in parts of their DNA as people who smoke cigarettes.

These specific chemical alterations, also known as epigenetic changes, can cause genes to malfunction — and are commonly found in nearly all types of human cancer as well as other serious diseases.

The findings add to a growing list of health concerns associated with vaping, which is perceived by many as a safer alternative to smoking. E-cigarette use has soared among youth, with more than 25 percent of high school students now using the products, according to the CDC.

The new study, led by Ahmad Besaratinia, PhD, associate professor at the Keck School of Medicine of USC, examined a group of people matched for age, gender and race, divided equally into three categories: Vapers only, smokers only and a control group of people who neither vaped nor smoked.

Blood was drawn from each of the participants and tested for



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changes in levels of two specific chemical tags attached to DNA that are known to impact gene activity and/or function. These chemical tags include: (1) methyl groups in a specific DNA sequence, named Long Interspersed Nucleotide Element 1 (LINE-1); and (2) hydroxymethyl groups in the genome overall. Changes in the levels of these chemical tags, which are important for genomic stability and regulation of gene expression, occur in various stages of development, as well as in diseases such as cancer.

Of the 45 study participants, vapers and smokers both showed significant reduction in the levels of both chemical tags compared to the control group. This is the first study to show that vapers, like

smokers, have these biologically important changes detectable in their blood cells.

"That doesn't mean that these people are going to develop cancer," said Besaratinia. "But what we are seeing is that the same changes in chemical tags detectable in tumors from cancer patients are also found in people who vape or smoke, presumably due to exposure to cancer-causing chemicals present in cigarette smoke and, generally at much lower levels, in electronic cigarettes' vapor."

This is the newest study Besaratinia's team has done on vapers and smokers. Their earlier study published last year (JMS, 2019) examined changes in gene expression in epithelial cells taken from

the mouths of vapers and smokers compared to a control group. In that study, both vapers and smokers showed abnormal gene expression in a large number of genes linked to cancer.

"Our new study adds an important piece to that puzzle by demonstrating that epigenetic mechanisms, specifically changes in chemical tags attached to the DNA, may contribute to the abnormal expression of genes in vapers and smokers alike," said Besaratinia.

He and his team plan to continue their research. The next step is to look at the whole genome and identify all the genes targeted by these two chemical changes in vapers versus smokers.

"Considering the established role many genes play in human diseases, this investigation should provide invaluable information, which may have immediate public health and policy implications," said Besaratinia.

"The epidemic of teen vaping and the recent outbreak of vaping-related severe lung injury and deaths in the US underscore the importance of generating scientific evidence on which future regulations for electronic cigarette manufacturing, marketing, and distribution can be based."

Source: Keck School of Medicine

Postmenopause vitamin D deficiency associated with disc degeneration, lower back pain

Lumbar disc degeneration and resulting lower back pain become greater concerns with age and disproportionately affect women more than men, likely as a result of decreasing estrogen levels during menopause.

A new study demonstrates that vitamin D deficiency, smoking, high body mass index (BMI), and osteoporosis are risk factors for greater back pain. Study results are published online in *Menopause*, the journal of The North American Menopause Society (NAMS).

Lumbar disc degeneration is a common musculoskeletal disease that often causes lower back pain. Previous studies have shown the effect of estrogen on disc degeneration, which partially explains why degeneration is more severe in postmenopausal women than in men of the same age. In addition to lower estrogen concentrations, vitamin D deficiency is common during the

postmenopause period.

Vitamin D is critical in maintaining levels of calcium and phosphorus, helping to prevent bone diseases such as rickets and osteoporosis. Recent studies have shown that vitamin D deficiency is associated with lower back pain and that supplementation can relieve this pain and improve musculoskeletal strength. But few studies have been conducted regarding the role of vitamin D in spinal degeneration, especially in postmenopausal women.

This new study evaluated vitamin D status in postmenopausal women and its relationship with disc degeneration and lower back pain. It concluded that vitamin D deficiency is highly prevalent in postmenopausal women and that a serum concentration of vitamin D less than 10 ng/mL, indicating severe deficiency, should be considered an indicator of severe disc degeneration and lower back pain. It further identified

additional risk factors such as smoking, high BMI, and osteoporosis for lower back pain beyond vitamin D deficiency.

Study results appear in the article "Does vitamin D status influence lumbar disc degeneration and low back pain in postmenopausal women? A retrospective, single-center study."

"This study shows that very low vitamin D levels were linked to a greater likelihood of moderate to severe lower back pain and more severe lumbar disc degeneration, possibly because of the beneficial effects vitamin D has on nerve and muscle pain sensitivity, muscle strength and mass, and inflammation. Although not all women need vitamin D supplementation, this speaks to the importance of avoiding severe vitamin D deficiency states," said Dr. Stephanie Faubion, NAMS medical director.

Source: The North American Menopause Society