

# Learning after sleep may be key for consolidating information



**S**leep may be more important to learning than previously believed, new research suggests. Researchers from Brown University and the RIKEN Center for Brain Science provide further evidence on the correlation between sleep and learning. Scientists found that processes specifically related to learning help a person consolidate during sleep what they learn while awake. They believe their findings provide more proof of a learning-dependent model rather than a use-dependent model when it comes to how sleep supports the learning process.

Staying up late to cram for tests has become a normal part of the high school and college academic process. Now, researchers from Brown University in the United States and the RIKEN Center for Brain Science in Japan say that this practice hinders rather than helps the learning process. Researchers found evidence that suggests sleep helps a person absorb what

they learn while awake through a process that is specifically centered on learning. This means that the more sleep a person gets, the more time their brain has to process knowledge and skills learned while they are awake.

The results from this study appear in *The Journal of Neuroscience*. According to lead study author Dr. Yuka Sasaki, professor of cognitive, linguistic, and psychological sciences in the Neuroscience Graduate Program at Brown University, sleep facilitates learning. However, researchers had conflicting models to explain how it does that — the use-dependent model and the learning-dependent model.

The use-dependent model Trusted Source states that the amount a person learns while sleeping is the result of how the brain functions when awake. On the other hand, the learning-dependent model states that what a person retains during sleep is directly connected to a neural process specifically

related to learning. For this study, Dr. Sasaki and her team wanted to find out which model was most likely to aid learning. Researchers used two experimental sets of human volunteers, including a mix of both males and females. During the first experiment, participants learned a visual perceptual learning Trusted Source (VPL) task called a texture discrimination task (TDT). A VPL task helps strengthen the brain's ability to comprehend what the eyes see. This helps in a variety of visual perception skills, such as visual and sequential memory, being able to differentiate between one object and another, and visual-spatial relations.

Participants in the first group underwent a pre-training test, TDT training, and a post-training test. A 90-minute nap followed the second test. Then facilitators conducted a third testing session after the nap to find out how much learning participants retained. —Agencies

## Hepatitis C infection: 'Not a death sentence, it is highly curable'

**ISLAMABAD:** Hepatitis C infections are some of the most common that affect the liver. They are caused by the hepatitis C virus (HCV). Globally, HCV affected an estimated 71 million people in 2015, and between 2013 and 2016, about 2.4 million people in the United States were living with HCV infections. If a person does not receive a diagnosis and treatment, an HCV infection can become chronic, leading to a risk of cirrhosis, which is scarring of the liver. Because initial symptoms of an HCV infection can go undiagnosed for a long time, the Centers for Disease Control and Prevention (CDC) now advise "one-time hepatitis C testing of all adults (18 years and older) and all pregnant women during every pregnancy." What people need to understand is that this virus, although highly curable, if left untreated, becomes one of the main causes of cirrhosis and liver cancer. Most people do not exhibit any symptoms, but a few "unlucky" ones may experience fatigue, fever, nausea, vomiting, abdominal pain, and even jaundice. The most common way of becoming infected is through exposure to infected blood. A small quantity of it is enough for someone to contract the virus. Although the most cited means of infection are through intravenous drug use, unsafe injection practices, contaminated blood transfusions or blood products, or inadequate sterilization of medical equipment, sometimes a small cut on the finger will suffice. —Online



## New study finds 27 proteins that may predict heart disease risk



**P**redicting cardiovascular risk is important for clinicians providing patient care and for scientists developing new drugs. Scientists can use biomarker surrogates as signs that cardiovascular disease (CVD) risk may increase or decrease.

In the new study, scientists have developed a blood test that offers an accurate and personalized prediction of CVD. In a new study, scientists have reported findings that show a blood test can be used to predict CVD. The study, published in the *Journal of Science Translational Medicine*, opens the door to more individualized treatment plans for CVD. It may also improve the speed at which new CVD drugs can be identified and developed.

When a new drug is developed, scientists have to make sure that it is both effective and safe. This is a rigorous process that can often take

many years. While important, this significantly slows down the speed at which new drugs can be developed, and also increases the costs. One way of increasing the speed and reducing the cost of drug development without sacrificing efficacy or safety is to use a surrogate biomarker as a predictor of risk.

If a surrogate can reliably predict risk, then some stages of clinical trials can be streamlined. Finding a surrogate that can accurately predict the risk of certain diseases can also benefit patients directly. If a clinician can measure a reliable surrogate they can potentially prevent a disease before it has developed, reducing the risks to the patient. Medical News Today spoke with Dr. Stephen Williams — Chief Medical Officer at Somalogic, and the corresponding author of the present study — who stressed the importance of surro-

gates, particularly for CVD risk. "For situations where clinical cardiovascular outcomes studies are required today, a surrogate enables unsafe or ineffective candidate drugs to be terminated early and cheaply and supports the acceleration of safe and effective drugs. Participants in the trials do not have to have events or die in order to contribute to the signal." "In personalized medicine, a surrogate enables cost-effective allocation of treatments to the people who need them the most, and potentially increases the uptake of newer more effective drugs so that outcomes are improved," said Dr. Williams. In 2004 the United States Food and Drug Administration (FDA) published a report Trusted Source recommending that researchers identify biomarker surrogates that could help in CVD drug development and improve individ-

## The close relationship between sleep and mental health

**ISLAMABAD:** Not getting enough sleep skews our ability to regulate our emotions. In the long run, this can increase our risk of developing a mental health condition. In turn, conditions such as anxiety and depression may cause further sleep disruption. Shakespeare's description of sleep as "nature's soft nurse" was closer to the truth than he could have known. Insufficient sleep increases the risk of type 2 diabetes, cardiovascular disease, and obesity. Sleep is essential for the physical upkeep of the body, but it also helps maintain cognitive skills, such as attention, learning, memory, and emotional regulation. Getting a good night's rest even underpins our ability to perceive the world accurately. Research suggests that going completely without sleep for 3 or more nights in a row results in perceptual distortions, hallucinations, and delusions. The latest discoveries about the importance of sleep for physical and mental well-being come at a time when technology is putting pressure on sleep time as never before. Social media, the internet, TV on demand, and video games are increasingly keeping us from our beds in the evenings. Poor sleep is a recognized risk factor for the development of a range of mental health issues. A study that followed 979 young adults in Michigan, for example, found that insomnia was associated with a four-fold higher risk of depression 3 years later. A review of research found evidence that insomnia preceded the development of not only depression but also bipolar disorder and anxiety disorders. The researchers also found a link between insomnia and an increased risk of suicide. —Online



## Novel cell may warn of rheumatoid arthritis flare-up

**ISLAMABAD:** New research has found a novel cell that can act as a warning sign of a rheumatoid arthritis flare-up. Rheumatoid arthritis is a type of autoimmune condition. In autoimmune conditions, a person's immune system mistakenly attacks healthy cells. This causes inflammation. In rheumatoid arthritis, this inflammation typically affects a person's joints — particularly the wrists, hands, and knees. As well as painful swelling, rheumatoid arthritis can result in tissue damage and chronic pain, difficulties with balance, and joint irregularities. Rheumatoid arthritis is characterized by periods during which the symptoms are minimal and periods during which they are more severe (flare-ups). Predicting flare-ups is difficult, which can make managing the periods during which rheumatoid arthritis inhibits a person's everyday functioning very challenging. To better understand how and why flare-ups occur, the authors of the recent study looked into participants' blood, instead of their joints. The team has expertise in analyzing RNA, which is a type of messenger that carries instructions from a person's DNA, to understand its connection with various conditions. Experts can analyze RNA using blood tests. The researchers used a process called longitudinal RNA sequencing, which monitors changes in a person's RNA over a long period of time. This allowed them to gain valuable information as rheumatoid arthritis flare-ups came and went. Over 4 years, one person with rheumatoid arthritis underwent weekly finger-prick blood tests that they completed at home and posted to the researchers. —Online



## New hope to help advanced Parkinson's patients walk, sleep again

**PARIS:** People with advanced Parkinson's disease often struggle to walk more than a few steps or sleep through the night, but new research offers hope of relief from these two debilitating symptoms.

Suffered by millions worldwide, the degenerative disease erodes motor functions and in its later stages often confines patients to a bed or wheelchair. This is due to a condition called orthostatic hypotension, which occurs when a person stands up and their blood pressure drops, causing dizziness and even fainting after a couple of steps.

For Parkinson's sufferers, it happens because a regulator in the brain — which normally ensures sufficient blood flows to the brain when we stand up — has been disrupted. But new French research published in the *New England Journal of Medicine* last week found that a spinal

cord implant could help advanced Parkinson's patients get back on their feet.

Earlier this year neurosurgeons Jocelyne Bloch and Gregoire Courtine revealed that such an implant had enabled three paralysed people to walk again. Both were also involved in the latest research, which tested a similar implant on a 48-year-old woman.

While the woman did not have Parkinson's, she had such similar symptoms — including orthostatic hypotension — that she was initially diagnosed with the disease.

For paralysed people, the spinal cord implant mimics how the brain sends electrical pulses to muscles, reconnecting a severed link. But for orthostatic hypotension, it stimulates the regulator in the brain that senses the need to send more blood when people stand upright. Before receiving the implant, the woman

could walk after a taking a few of steps. Three months after the surgery, she was able to walk more than 250 metres (820 feet) with the help of a walking frame, the study said.

"She is not cured, she would not run a marathon, but this surgery has clearly improved her quality of life," Bloch told AFP. However it is a single case and further research is needed, particularly involving Parkinson's patients.

It is not yet certain that the form of orthostatic hypotension seen in Parkinson's patients can be fixed solely by stimulating the regulator the implant targets. Insomnia is another common scourge of the 10 million Parkinson's sufferers globally, more than three quarters of whom have sleep-related symptoms, according to the Parkinson's Foundation. Sleep can be affected by uncontrolled shaking which wakes

patients up, while another factor is a lack of a dopamine, common in people with Parkinson's.

The medication apomorphine is normally used to replace dopamine, lessening symptoms such as shaking and stiffness. But when taken orally, the drug can cause dopamine to spike and then drop, leading to muscle spasms. A device similar to an insulin pump that delivers continuous apomorphine throughout the night could solve the problem, according to a study published in the *Journal of Neurology* on Thursday. Co-author Emmanuel Flament-Roze led previous research indicating that such a pump would help with Parkinson's, but the new study looked at how it helped with sleep. The randomised study found that those using the pump had "significantly improved" sleep compared to those who received a placebo. —AFP

