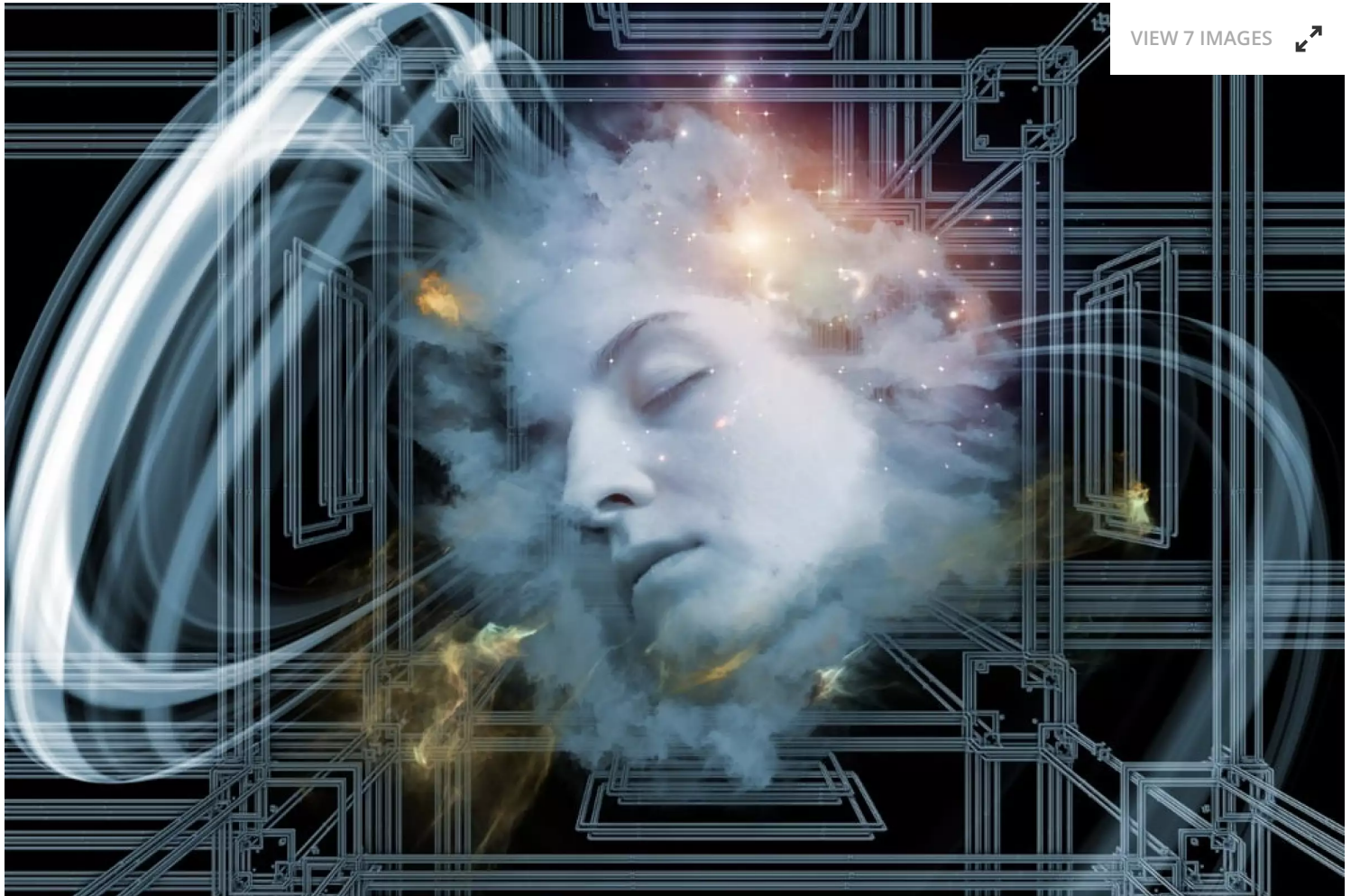




SCIENCE

Revolutions: The science of sleep

By Rich Haridy
March 10, 2019



Using zebrafish as a model scientists have discovered repairing DNA damage in neurons may be one of the reasons why all animals need to sleep [agsandrew/Depositphotos](#)

VIEW GALLERY - 7 IMAGES

[Revolutions](#) is a series that brings together a hand-picked selection of recent articles canvassing cutting-edge insights into major scientific advances. This installment brings you up to date with the ground-breaking new discoveries made in the science of sleep.

AD

 KAJABI

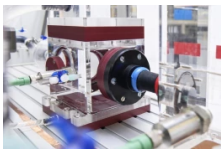
Start your **free 30 day** trial today!

[Start for free](#)

Get 30 Days Free

We all intimately understand how important sleep is in maintaining well-being and health. Have a couple of bad nights and pretty quickly you'll feel irritable, cranky and unwell. It is clear humans spend one third of their life asleep for a fundamental reason, and while scientists have slowly learned more and more about what our bodies are doing while we sleep, there is still so much about sleep that remains a mystery.

MORE STORIES



Artificial aorta takes pressure off the heart to reduce transplants



Scientists engineer stronger road material using recycled face masks

We know sleep consists of several different phases (from REM to slow-wave) and we also know our circadian clock regulates daily sleep cycles. But why is our need for sleep so profound? And what chronic diseases might be caused by sleep disruptions?

Recent scientific discoveries have revealed sleep may be more important for our health than we previously imagined. From depression and weight gain, to dementia and Alzheimer's disease, here is a rapid rundown of the latest things we have learned about sleep, and it suggests concentrating on getting a solid eight hours a night could be one of the most important things you can do for your overall health.



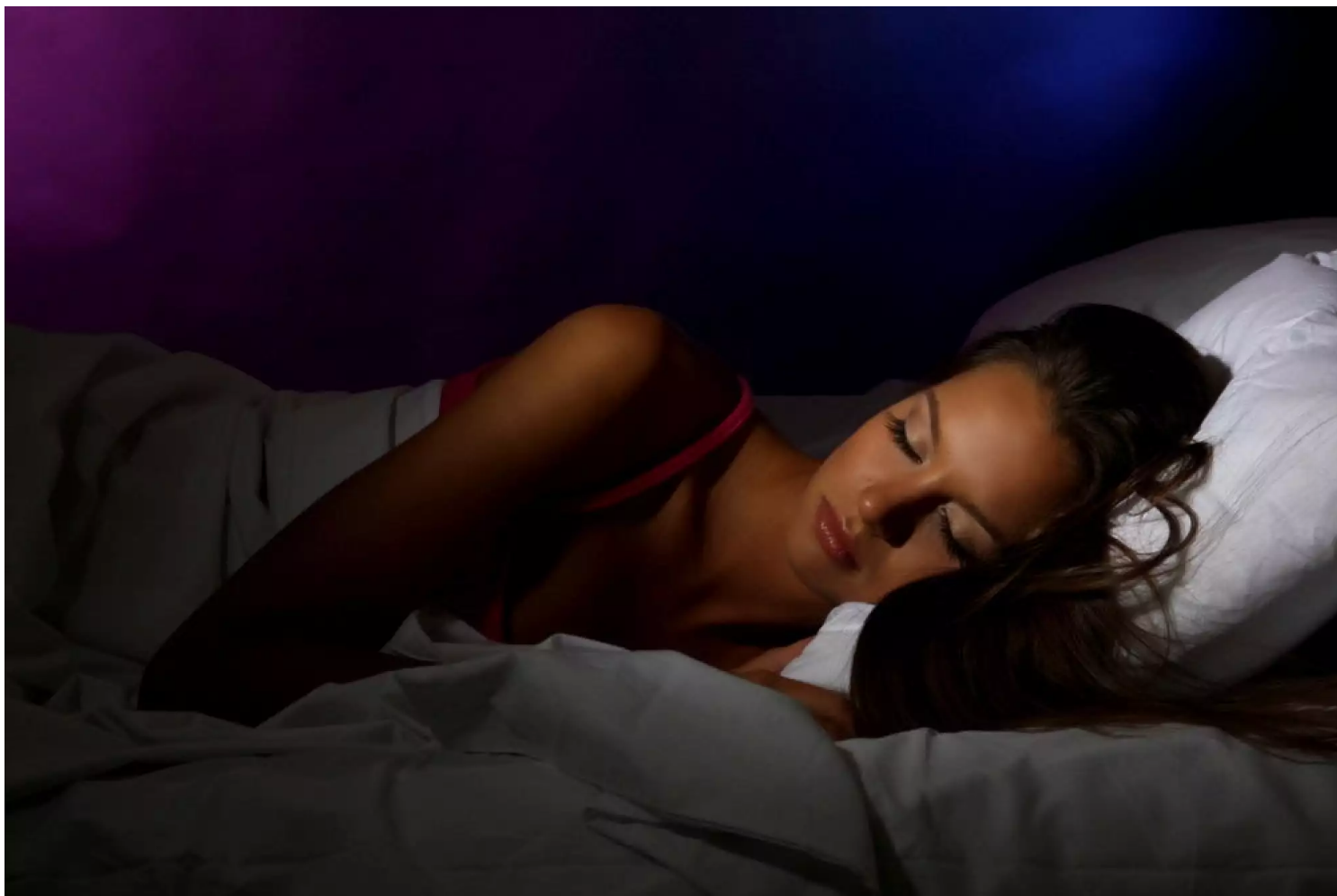
Screen Share Productivity

Avaya

[Learn More](#)

Too much sleep is just as bad for your brain as too little

Late in 2018 the first results from the world's largest sleep study were published and they revealed more sleep is not necessarily better. The study found between seven and eight hours of sleep was the optimal range for a healthy adult. Subjects in the study that slept more than eight hours tended to display similar cognitive impairments to those that slept less than seven hours. So unless you are a teenager, sleeping ten hours a night may be just as unhealthy as sleeping for six hours. [Read more](#)



Between seven and eight hours of sleep is the ideal duration for optimal cognitive performance according to a study [belchonock/Depositphotos](#)

Alzheimer's and Dementia

Clinicians have long seen an association between age-related cognitive decline and disrupted sleep. Some of the most revelatory recent sleep science has uncovered a potential causal relationship that suggests bad sleep could actually be contributing to the onset of Alzheimer's disease. The two toxic proteins most commonly associated with neurodegenerative diseases have been found to be directly driven by sleep deprivation. [Read more](#)

Perhaps most striking was a recent study that specifically homed in on the sleep phase responsible for clearing the brain of toxic amyloid and tau proteins. It was revealed that slow-wave sleep is the phase most effective at clearing waste from the brain. A separate study into humans suffering from sleep apnea affirmed those subjects unable to consistently enter deep slow wave sleep seemed to display higher tau protein accumulations in the brain. [Read more](#)

The red and orange shades illustrate the areas in the brain that display higher levels of toxic proteins aggregating in relation to reduced amounts of slow-wave sleep Brendan Lacey

How sleep repairs damaged DNA in the brain

Using a high-resolution microscope that allowed researchers to observe chromosome activity within a single neuron in zebrafish, it was recently revealed that the DNA damage that accumulates in neurons during waking hours is efficiently repaired during sleep. When this natural sleep-wake rhythm is disrupted, excess DNA damage can accumulate in a neuron. What this all means is still unknown, but it suggests a fundamental importance to sleep that explains why every animal on the planet has evolved this process. [Read more](#)

Two massive genetic studies zero in on the origins of insomnia

Insomnia may feel like a purely psychological condition, a side-effect of depression, anxiety or stress. However, an interesting body of research is beginning to indicate the condition may be fundamentally [underpinned by genetic triggers](#).

One of the most interesting findings from this new research was a lack of genetic overlap between insomnia and other sleep-related traits. It seems the genetic underpinning of insomnia is more related to psychiatric conditions such as depression and anxiety. This compelling discovery suggests prior work

investigating insomnia treatments that target sleep-regulating brain areas may have been looking in the wrong place. [Read more](#)

The research examined over a million people finding hundreds of genes that could be associated with insomnia [photographee.eu/Depositphotos](https://www.photographee.eu/Depositphotos)

Newly discovered mechanism connects depression and bad sleep

A 2018 study from a team of international researchers found a unique neurological mechanism underlies the oft-seen association between depression and sleep disruption. The results revealed that those suffering from depression and bad sleep displayed unusually increased connectivity between three different brain regions: the dorsolateral prefrontal cortex, the precuneus, and the lateral orbitofrontal cortex. The hypothesis is that bad sleep is not a symptom of depression, but the two are much more fundamentally intertwined. [Read more](#)

The weird connection between sleep and hydration

A study from researchers at Penn State has revealed a new reason why getting less than the recommended eight hours of sleep a night could be damaging to our health. The research found adults who only got around six hours of sleep per night were more likely to be dehydrated, and the cause could be a particular hydration-regulating hormone that is released late in a person's sleep cycle. [Read more](#)

New research suggests sleeping six hours a night may lower the release of a hormone that directly controls the body's hydration levels [ArturVerkhovetskiy/Depositphotos](#)

How sleep loss leads to weight gain

What if the frequent connection between bad sleep and weight gain was not simply due to eating junk food late at night? What if sleep loss actually results in more direct metabolic alterations at a tissue level? A study from Uppsala University identified two separate metabolic mechanisms that were triggered following sleep deprivation. Taken together, these two processes could underpin how sleep disruptions can cause both a gain in fat mass and a loss of lean muscle. [Read more](#)

Bad news night-owls: Staying up late could be killing you

Are you a night owl or a morning lark? Some people naturally gravitate to staying up late, and while genetics do play a major role in establishing your body clock, some research is suggesting later bedtimes could be bad for your health. A new large-scale observational study involving data from nearly half a million people has found that night owls have a 10 percent higher risk of dying sooner than those with a preference for getting to bed early. [Read more](#)

Another study, from scientists at the University of Colorado Boulder, studied how protein levels in human blood can vary over a 24-hour period depending on when a person is sleeping and eating. The striking results found that when a person stays up all night, the patterns of over 100 different proteins in the blood are disrupted. [Read more](#)

Pulling just one all-nighter can disrupt levels of proteins in the blood known to influence metabolism, immune function and blood sugar [DragonImages/Depositphotos](#)

Sleep deprivation makes pain feel worse

Around 60 percent of patients suffering chronic pain also report consistent sleep disruptions. This connection is perhaps unsurprising, after all, if you are in pain it is undoubtedly difficult to sleep. But

what if sleep loss was actively increasing a person's sensitivity to pain? A fascinating fMRI study showed that sleep loss not only amplifies activity in the pain sensing regions of the brain but also blocks the natural analgesia centers. [Read more](#)

Sleep and learning

A new sleep learning study has found subjects can remember auditory information delivered to them while asleep Scientifilms - Déchiffrer la conscience, voyage dans l'étoffe de nos pensées

We know that information acquired during waking states is imprinted on a deeper level when followed by a sleep period, but a new study from the University of Bristol has found short naps can also help a person process information they were not even consciously aware of perceiving. [Read more](#)

Another study from a team in Paris investigated the old idea of "sleep learning", the idea we can acquire new information while we are asleep. It turns out we can learn while we sleep, but it crucially depends on what phase of sleep the auditory information is delivered during. [Read more](#)

VIEW GALLERY - 7 IMAGES

We recommend

Palbociclib in combination with endocrine therapy versus capecitabine in hormonal receptor-positive, human epidermal growth factor 2-negative, aromatase inhibitor-resistant metastatic breast cancer: a phase III randomised controlled trial-PEARL

Martin M, et al., *Annals of Oncology*, 2021

A prospective observational study of patient-reported functioning and quality of life in advanced and metastatic breast cancer utilizing a novel mobile application

Richardson D et al., *Breast Cancer Research & Treatment*, 2021

The Food and Drug Administration Approves Orladeyo to Prevent Hereditary Angioedema Attacks

MRP, 2020

Article - The Growing Impact of Globalization for Health and Public Health Practice

Annual Reviews

Powered by **TREND MD**

TAGS

SCIENCE

SLEEP

SLEEPING

REVOLUTIONS

**Rich Haridy**

With interests in film, new media, and the new wave of psychedelic science, Rich has written for a number of online and print publications over the last decade and was Chair of the Australian Film Critics Association from 2013-2015. Since joining New Atlas Rich's interests have broadened to encompass the era-defining effects of new technology on culture and life in the 21st century.

2 COMMENTS

[Sign in](#) to post a comment.

Please keep comments to less than 150 words. No abusive material or spam will be published.

JimFox MARCH 12, 2019 10:33 AM

Good grief! Another scarefest; at 73 & having apnea for years, with depression & bad sleep I MUST be dead!!!

Jean Lamb MARCH 17, 2019 11:55 PM

One reason being a night owl is bad could be that they have to get up early and fight against their natural cycles, unlike larks, who determined the cycle that the rest of us must live by.

RELATED STORIES

SCIENCE

GPS backpacks shed light on nightlife of desert bats

SCIENCE

Ancient tools suggest humans spread across Eurasia earlier than previously thought

SCIENCE

More genes in the human microbiome than stars in the observable universe

SCIENCE

Autonomous watercraft to search the sea for Amelia Earhart's airplane

MOST VIEWED

SCIENCE

Newly discovered "nano-chameleon" is world's smallest known reptile

AUTOMOTIVE

Challenger Combo drives like a camper van, lives like a motorhome

ENERGY

Powerpaste packs clean hydrogen energy in a safe, convenient gray goop

SCIENCE

Mystery Dyatlov Pass deaths may be explained by new scientific theory

You May Like

Sponsored Links by Taboola

¡El hombre decide solicitar el divorcio después de mirar más de cerca esta foto!

Car Novels

30 Rare Pics Of Diana You've Never Seen...

Journalistate

Three Men Ask Waitress To Settle Bill In Private, Then Bartender Sees Check And Realizes Why

Dailyforest

He Was Forced To Leave His Property When He Found Out About Its Secret

High Tally

NEW ATLAS

Over 280,000 people receive our email newsletter. See the stories that matter in your inbox every morning.

JOIN

HOME

FEATURES

REVIEWS

ABOUT

ADVERTISE

TERMS

PRIVACY

CONTACT

RSS

FAQ

LIFESTYLE

Architecture

Around the Home

Children

Collectibles

Good Thinking

Health & Wellbeing

Holiday Destinations

Outdoors

Pets

Remarkable People

Tiny Houses

SCIENCE

Biology

Electronics

Energy

Environment

Materials

Medical

Physics

Quantum Computing

Space

TECHNOLOGY

3D Printing

Computers

Deals

Photography

Drones

Games

Home Entertainment

Laptops

Military

Mobile Technology

Music

Robotics

Smartwatches

Telecommunications

Wearable Electronics

Virtual Reality

TRANSPORT

Aircraft

Automotive

Bicycles

Marine

Motorcycles

Urban Transport

© 2021 New Atlas