



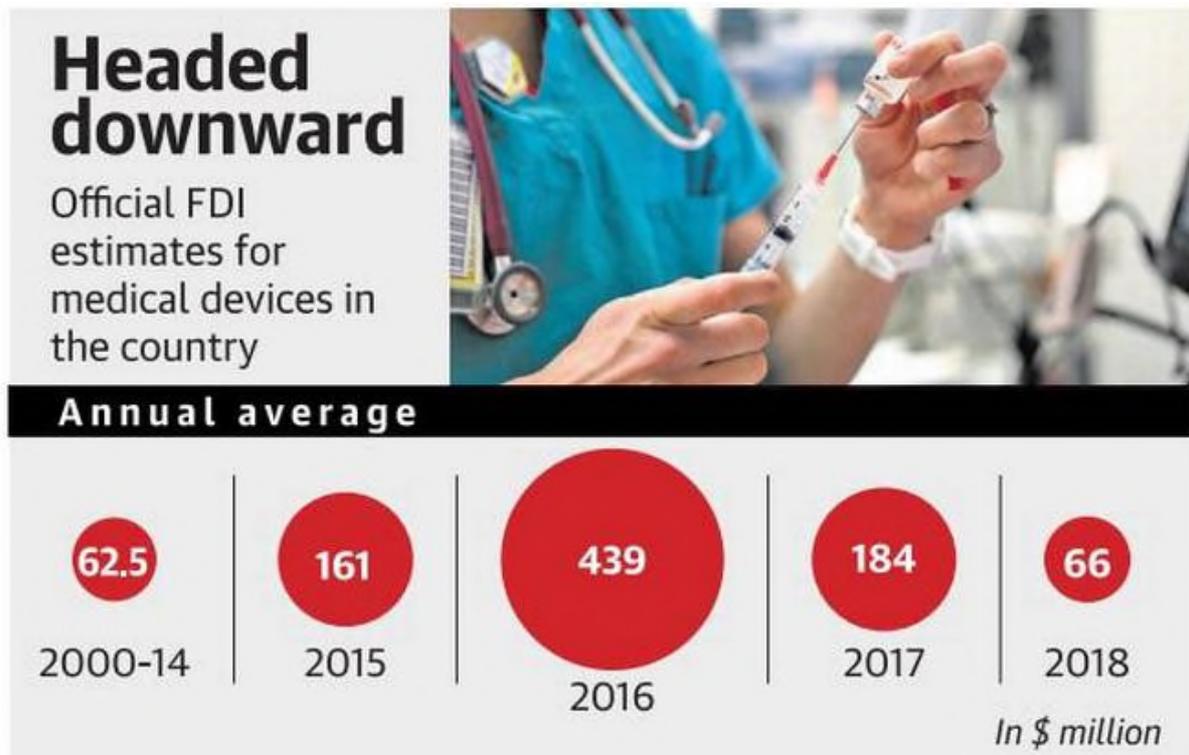
# DAILY NEWS BULLETIN

LEADING HEALTH, POPULATION AND FAMILY WELFARE STORIES OF THE Day  
Wednesday 20190424

## FDI in medical devices sector?

### Price controls hurting FDI in medical devices sector? (The Hindu: 20190424)

<https://www.thehindu.com/news/national/price-controls-hurting-fdi-in-medical-devices-sector/article26924501.ece>



Industry sources blame drastic fall in FDI to \$66 million on govt. curbs

Blanket implementation of price controls has contributed to a drastic fall in Foreign Direct Investment (FDI) in the medical device sector, say industry insiders, pointing to a reduction from \$439 million in 2016 to \$66 million in 2018.

“Data released by the Government Department for Promotion of Industry and Internal Trade clearly show this decline which has happened even though FDI is allowed through automatic route,” said Mr. Pavan Choudary, heading the Medical Technology Association of India (MTAI). The Association represents leading global medical technology companies with a substantial footprint in India.

“We posit that this decline was the unintended consequence of the well meaning intention but the anomaly needs to be corrected,” Mr Choudary said.

Not specific to industry

Countering the argument, Pritam Datta, Fellow, National Institute of Public Finance and Policy (NIPFP), and author of “Medical Devices Manufacturing Industry-estimation of market size and import dependence in India”, said, “We are talking about a country which imports 70 % of its medical devices and it is only now that we have started manufacturing high-end medical devices. While there has been a fall in this sector, it cannot be attributed only to the price control in India. We have always seen that around the election year there is a fall in FDI in all sectors. This is also a growing sector.”

Sectors in India which attract the highest FDI according to government figures include services sector, computer software and hardware and telecommunication.

Meanwhile, in 2015 the Centre approved 100% FDI in the medical devices sector via automatic route. Previously medical devices, which came under the pharma sector, could take in 100% FDI through automatic route only in case of new ventures. Further approval of Foreign Investment Promotion Board (FIPB) was needed in case of acquisition of existing companies.

The break-through came after the industry urged approval for FDI through automatic route, pointing out that there were no big firms for medical devices in India, and hence no threat of merger or acquisition.

“When in 2015 the government allowed 100% FDI through automatic route in India it took the annual FDI inflow in medical devices that year from an average of \$62.5 million to \$161 million. Further in the next year, 2016, the first full year of this change, the FDI rose to \$439 million. The FDI seemed set for a similar climb in future and establish India as an attractive destination for investments in medical device manufacturing,” a statement from the MTal said in response to questions from The Hindu.

The FDI fell first to \$184 million in 2017 and then to \$66 million in 2018.

Tech intensive

The medical device industry is highly technology and capital dependent and experts say it is vital “that the global community be kept engaged for this wealth and technology inflow as well as to help co-create an ecosystem for manufacturing of medical devices in India.”

The group has now demanded that India should work towards “resuming collaboration with the capital, technology and export markets of the world.”

## **Physical activity**

### **Physical activity may offset health risks of desk-bound work (The Tribune: 20190424)**

<https://www.tribuneindia.com/news/health/physical-activity-may-offset-health-risks-of-desk-bound-work/762635.html>

A weekly dose of at least 150 minutes of physical activity could substantially reduce the health risks in desk-bound office workers, a study has found.

Sitting is often touted as 'the new smoking', but it is unclear if it is the sitting itself or the lack of physical activity that causes the harm.

It has also been unclear what level of moderate to vigorous intensity physical activity—routine activities like walking briskly to work, as well as sport and exercises—might offset this risk.

Scientists from University of Sydney in Australia have examined the associations of sitting and physical activity with premature death and cardiovascular disease mortality, and estimated what level of moderate to vigorous intensity physical activity might offset health risks of sitting.

The researchers statistically modelled physical activity and sitting against death records of nearly 150,000 study participants aged 45 years and over and followed up over almost nine years.

According to the study, physical activity is particularly important for people who sit a lot. Reducing sitting would be a good start but is not enough: the most important lifestyle change for such people would be to look for or create opportunities to move more daily.

Replacing sitting with physical activity—but not standing—reduced mortality risk among 'high sitters', people who sit over six hours per day, said Emmanuel Stamatakis, from the University of Sydney.

"In our study, sitting time was associated consistently with both overall premature mortality and cardiovascular disease mortality in the least physically active groups—those doing under 150 minutes of moderate to vigorous intensity physical activity per week," Stamatakis said.

"For example, people who were physically inactive and sat for more than eight hours per day had 107 per cent higher risk for cardiovascular death compared to those who did at least one hour physical activity per day and sat less than four hours," he said.

Stamatakis said the findings would be useful for public health officials, health care workers, but also people who sit a lot, such as workers in office-based and other sedentary jobs.

"Any movement is good for health but physical activity of moderate to vigorous intensity—that is activities that get people out of breath—is the most potent and most time-efficient," Stamatakis said.

"Exercise and sports are a great way to be active but are not the only way—walking fast, climbing stairs, and cycling to get from place to place are only some of the many opportunities everyday life offers to move and even 'huff and puff' sometimes," he said. — PTI

## **Almonds**

### **Almonds may cut heart disease risk in diabetics: Study (The Tribune: 20190424)**

<https://www.tribuneindia.com/news/health/almonds-may-cut-heart-disease-risk-in-diabetics-study/762632.html>

Eating tree nuts, such as almonds, may help reduce the risk of cardiovascular disease.

Eating tree nuts, such as almonds, may help reduce the risk of cardiovascular disease for adults with type 2 diabetes, a Harvard study has found.

The study shows that people with diabetes who ate at least five servings of nuts per week had a 17 per cent lower risk of total cardiovascular disease incidence compared to those who ate one or less weekly servings.

They also had a 20 per cent lower risk of coronary heart disease, a 34 per cent lower risk of cardiovascular disease death and a 31 per cent reduced risk of death from all causes.

The study included 16,217 men and women who either had type 2 diabetes at the start of the study or who were diagnosed during the time of the study. A serving in the study was defined as one ounce or 28 grammes of nuts.

The researchers from Harvard University in the US said that compared to those who did not change their nut-eating habits after their diabetes diagnosis to those who did begin to eat more nuts had an 11 per cent lower risk of cardiovascular disease, a 15 per cent lower risk of coronary heart disease, a 25 per cent lower risk of cardiovascular disease death and a 27 per cent lower risk of all-cause premature death.

Whether they did or did not eat nuts prior to their diabetes diagnosis, adding even a small amount of nuts offered a beneficial effect.

An additional serving of nuts each week was associated with a 3 per cent lower risk of cardiovascular disease and a 6% lower risk of death from cardiovascular disease.

The overall findings of the study held true even when gender, body weight and smoking factors were considered, researchers said.

Previous research supports the positive role of nuts in heart health, and having diabetes has long been linked to increased risk of cardiovascular issues. — PTI



## **Turmeric compounds**

**Turmeric compounds may help combat cancer: Study (The Tribune: 20190424)**

<https://www.tribuneindia.com/news/health/turmeric-compounds-may-help-combat-cancer-study/762622.html>

Compounds found in turmeric that can help prevent prevent and treat stomach cancer, scientists claim.

Compounds found in turmeric—a condiment commonly used in Indian cuisine—can help prevent prevent and treat stomach cancer, scientists claim.

Researchers Federal University of Sao Paulo (UNIFESP) and the Federal University of Para (UFPA) in Brazil identified possible therapeutic effects of curcumin—the yellow powder derived from the roots of the turmeric plant.

"We undertook a vast review of the scientific literature on all nutrients and bioactive compounds with the potential to prevent or treat stomach cancer and found that curcumin is one of them," Danielle Queiroz Calcagno, a professor at UFPA.

According to Calcagno, compounds such as cholecalciferol (a form of vitamin D), resveratrol (a polyphenol) and quercetin can prevent or combat stomach cancer because they are natural regulators of histone activity.

Histones are proteins in cell nuclei that organise the DNA double helix into structural units called nucleosomes, according to a study published in the journal *Epigenomics*.

Each nucleosome is made of DNA coiled like a spool around eight histone proteins (a histone octamer) to compact the DNA so that it fits in the cell, where it is packaged into chromatin.

Posttranslational chemical modification of the amino acid chain in these proteins, such as acetylation (introduction of an acetyl group) or methylation (addition of a methyl group), can affect chromatin compaction and hence gene expression.

"If the histones are acetylated, for example, the chromatin will be less condensed, and a gene in a region of the DNA segment inside it will be available to be expressed. In contrast, if the histones aren't acetylated, the chromatin will be more condensed, and the gene won't be expressed," Calcagno said.

Researchers studied histone acetylation patterns in stomach cell samples from healthy individuals and patients diagnosed with stomach cancer.

They found that the cells from stomach cancer patients displayed alterations in the pattern of expression of histone acetyltransferases (HATs) and histone deacetylases (HDACs).

These alterations are epigenetic and affect the structure and integrity of the genome in many tumors, including stomach cancer.

Recent research has also shown that nutrients and bioactive compounds can regulate the activity of HATs and HDACs, the scientists at UNIFESP and UFPA set out to identify any that might influence histone acetylation and hence help prevent stomach cancer or even treat the disease.

In addition to curcumin, other compounds found to play a key role in modulating histone activity were cholecalciferol, resveratrol (present mainly in grape seeds and red wine), quercetin (abundant in apples, broccoli and onions), garcinol (isolated from the bark of the kokum tree, *Garcinia indica*), and sodium butyrate (produced by gut bacteria via fermentation of dietary fiber).

"These compounds can favor the activation or repression of genes involved in the development of stomach cancer by promoting or inhibiting histone acetylation," Calcagno said. — PTI

## **Climate change**

### **Climate change stunted India's growth by 31 %'( Hindustan Times: 20190424)**

<http://paper.hindustantimes.com/epaper/viewer.aspx>

The Indian economy is 31% smaller than it should have been and the culprit is global warming, according to a study by Stanford researchers published in the Proceedings of the National Academy of Sciences (PNAS) on Monday.

Global warming arising from human activities has increased economic inequalities between countries by 25% in the half-century between 1961 and 2010, with rich countries becoming richer and poor countries becoming poorer, the study found.

"A few of the largest economies are near the perfect temperature for economic output. Global warming hasn't pushed them off the top of the

hill, and in many cases, it has pushed them toward it. But a large amount of warming in future will push them further and further from the temperature optimum," said co-author of the study, Marshall Burke, who teaches earth system sciences at Stanford University, in a statement. See page 8

# Countries with lost potential

■ Percentage impact



**Plastic waste (The Asian Age: 20190424)**

<http://onlinepaper.asianage.com/articledetailpage.aspx?id=12871447>

# Chaos after China plastic waste ban

Jenjarom (Malaysia), April 23: From grubby packaging engulfing small Southeast Asian communities to waste piling up in plants from the US to Australia, China's ban on accepting the world's used plastic has plunged global recycling into turmoil.

For many years, China received the bulk of scrap plastic from around the world, processing much of it into a higher quality material that could be used by manufacturers.

But at the start of 2018, it closed its doors to almost all foreign plastic waste, as well as many other recyclables, in a push to protect the local

## THE RECYCLING WOE

For many years, China received the bulk of scrap plastic from around the world, processing much of it into a higher quality material that could be used by manufacturers.



Plastic is being redirected in huge quantities to Southeast Asia, where Chinese recyclers have shifted en masse.

environment and air quality, leaving developed nations struggling to find places to send their waste.

"It was like an earthquake," Arnaud Brunet, director general of Brussels-based industry group The Bureau of International Recycling,

told AFP. "China was the biggest market for recyclables. It created a major shock in the global market." Instead, plastic is being redirected in huge quantities to Southeast Asia, where Chinese recyclers have shifted en masse.

With a large Chinese-

speaking minority, Malaysia was a top choice for Chinese recyclers..

In the small town of Jenjarom, not far from Kuala Lumpur, plastic processing plants suddenly appeared in large numbers, pumping out noxious fumes day and night.

—AFP

## Mediterranean diet

### Mediterranean diet prevents overeating (The Times of India: 20190424)

<https://timesofindia.indiatimes.com/home/science/mediterranean-diet-prevents-overeating/articleshow/69018223.cms>

In the study, the researchers from Wake Forest School of Medicine, US compared the effects of a Mediterranean diet with those of a Western diet in non-human primates.

Researchers found that the animals, following a Mediterranean diet, chose not to eat all the food available to them, which meant they maintained a lower body weight.

Can't stop overeating? Adopt a Mediterranean diet as it not only deters overeating but also protects against obesity and liver diseases, suggests a new study.

In the study, the researchers from Wake Forest School of Medicine, US compared the effects of a Mediterranean diet with those of a Western diet in non-human primates.

"By comparison, the animals on a Western diet ate far more than they needed and gained weight," said Carol A Shively, professor of pathology at the varsity.

Researchers found that the animals, following a Mediterranean diet, chose not to eat all the food available to them, which meant they maintained a lower body weight.

“The group on the Mediterranean diet actually ate fewer calories, had lower body weight and had less body fat than those on the Western diet,” Shively added.

“The Western diet was developed by companies who want us to eat their food, so they make it hyper-palatable, that it hits all our buttons so we overconsume,” they said.

The study also found that Mediterranean diet protects against non-alcoholic fatty liver disease, associated with obesity and can cause liver cirrhosis and cancer.

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## **Blood pressure**

### **Can a blood pressure drug protect the brain from Parkinson's? (Medical News Today: 20190424)**

<https://www.medicalnewstoday.com/articles/325016.php>

A prescription drug already in use for the treatment of high blood pressure could be effective against conditions such as Parkinson's, Alzheimer's, and Huntington's, in which toxic proteins build up in brain cells.

hypertension drugs on wooden background

Scientists could repurpose felodipine to prevent Parkinson's disease.

Scientists at the University of Cambridge in the United Kingdom and the Guangzhou Institutes of Biomedicine and Health in China suggest that the hypertension drug felodipine could be a promising candidate for "repurposing" as a treatment for neurodegenerative conditions.

In experiments with zebrafish and mice, they showed that felodipine can prompt a cellular recycling process called autophagy to clear away toxic proteins in brain cells, or neurons.

"Our data suggest," they write in a recent Nature Communications paper, "that felodipine induces autophagy in neurons and enhances removal of a range of disease-causing proteins: mutant huntingtin, mutant [alpha]-synuclein, and tau."

Mutant huntingtin is characteristic of Huntington's disease, while mutant alpha-synuclein and tau are hallmarks of Parkinson's disease and Alzheimer's disease, respectively.

The study is important because it shows that felodipine can remove mutant alpha-synuclein from the brains of mice at blood levels "similar to those that would be seen in humans taking the drug [for hypertension]."

"This is the first time," says corresponding study author David C. Rubinsztein, a professor of molecular neurogenetics at the University of Cambridge, "that we're aware of that a study has shown that an approved drug can slow the buildup of harmful proteins in the brains of mice using doses aiming to mimic the concentrations of the drug seen in humans."

"As a result," he continues, "the drug was able to slow down progression of these potentially devastating conditions and so we believe it should be trialed in patients."

### Toxic proteins and autophagy

The production of proteins in cells is complex and involves many components. The process makes a long chain of amino acids and then folds it into a 3D shape.

However, when proteins do not fold correctly, they can accumulate into potentially toxic clusters. Such accumulation is a trigger for autophagy, a cell function that removes the faulty proteins, breaks them down, and recycles the components.

Alzheimer's: Synthetic protein blocks toxic beta-amyloid

Alzheimer's: Synthetic protein blocks toxic beta-amyloid

Scientists have designed a protein that can block beta-amyloid in brain cells before it forms toxic clumps typical of Alzheimer's.

Prof. Rubinsztein and his colleagues comment that neurodegenerative diseases such as Parkinson's, Huntington's, and Alzheimer's commonly feature the "accumulation of aggregate-prone proteins within [...] neurons," and they cite studies that have shown how impairing autophagy can lead to such accumulation.

Studies have also shown that inducing autophagy chemically or genetically in flies, zebrafish, and mice can clear away these toxic proteins and reduce the damage they cause.

However, as yet, there are no treatments for neurodegenerative diseases that use "autophagy inducers." One way to develop treatments would be start from scratch with new experimental drugs.

Another way would be to search for potential candidates among the drugs that regulators have already approved for other human conditions and test them for the new condition. Such a route can cut the time and cost of developing a new treatment.

Grounds for 'cautious optimism'

The scientists used genetically altered mice and zebrafish for their study. The mice had gene alterations that induced them to develop either Huntington's disease or a type of Parkinson's disease. The zebrafish had gene alterations that induced changes that model a form of dementia.

Treatment with felodipine reduced the buildup of toxic, incorrectly folded proteins and signs of disease in the mouse models of Huntington's disease and Parkinson's disease, as well as in the zebrafish model of dementia.

When scientists study the effects of drugs in mice, they typically use higher levels than the doses that are safe in humans. In this study, however, the team showed that the blood levels of felodipine necessary for triggering autophagy were similar to those in humans.

They inserted "minipumps" under the mice's skin to enable drug concentrations at levels similar to those of humans and to keep the levels steady without wild fluctuations.

"Our data with this minipump administration suggest that at human-like plasma concentrations, felodipine can induce autophagy in the brains of mice and clear aggregate-prone disease-causing proteins," conclude the study authors.

These results are just the beginning, says Prof. Rubinsztein. "We need to be cautious," he adds, "but I would like to say we can be cautiously optimistic."

"The drug will need to be tested in patients to see if it has the same effects in humans as it does in mice."

## **Cancer:**

### **Cancer: Highly personalized therapy can improve outcomes (Medical News Today: 20190424)**

<https://www.medicalnewstoday.com/articles/325015.php>

The findings of a new study suggest that people who receive highly personalized combination therapy for treatment-resistant cancer can experience improved disease control and survival rates.

nurse speaking to inpatient

Can highly personalized precision medicine bring more benefits to people with metastatic cancer?

Recently, precision medicine has been gaining ground as a potentially more effective approach to treating a range of stubborn conditions and diseases, including many forms of cancer.

With this type of approach, researchers aim to better anticipate which types of treatments would best suit an individual, depending on their genetic makeup and the environmental and lifestyle factors that are relevant to them.

A new study — the findings of which appear in the journal *Nature Medicine* — now suggests that further personalizing precision medicine may be useful in treating cancers that do not respond to commonly prescribed therapies.

The researchers, many of whom are from the University of California, San Diego, in La Jolla, conducted a clinical trial to test whether personalized combination therapy can have a positive effect in people with refractory tumors. These are tumors that did not respond to previous treatment.

In order to find the best combination therapy match, they analyzed the participants' specific tumor mutations and tried to target them individually.

"Response rates to therapies that target one alteration can be low and not durable," notes first author Dr. Jason K. Sicklick. "Our approach went beyond targeting a single alteration. In collaboration with a multispecialty team of oncology experts, we formulated a personalized combination therapy for each patient," he explains.

"With this approach, we saw an increased response rate, as well as improved overall survival and progression-free survival in patients who were highly matched to treatment, versus those who were unmatched or less well-matched."

Dr. Jason K. Sicklick

Results of the prospective study

For their prospective study — which they called the Investigation of Profile-Related Evidence Determining Individualized Cancer Therapy (I-PREDICT) — the researchers recruited participants with metastatic cancer. Each had previously received treatment at one of two oncology centers: the Moores Cancer Center in La Jolla, CA, or the Avera Cancer Institute in Sioux Falls, SD

In total, the team enrolled 149 participants with metastatic, refractory cancer, and they managed to match 73 participants (or 49 percent) with combination therapy.

The researchers were not able to provide treatment for 66 of the enrolled participants, either because the disease was progressing quickly or because it was in a very advanced stage.

Alternative therapies for cancer: Do they do more harm than good?

Alternative therapies for cancer: Do they do more harm than good?

Researchers weigh in on the risks and benefits of some alternative therapies in managing cancer.

To find good treatment matches, the researchers conducted tumor DNA sequencing to identify the specific mutations in each person's tumors.

Then, the investigators consulted a team of specialists, including oncologists, pharmacologists, cancer biologists, surgeons, and geneticists, who helped them determine the best treatment combinations and matches.

For a person to be "highly matched" with a combination therapy, the researchers had to match over 50 percent of the individual's tumor mutations to drugs that could address each.

The investigators report that half of the highly matched participants responded to the prescribed therapies, while only 22 percent of those who either had no treatment matches or matches of a poorer quality responded to treatment.

"Having 50 percent of patients with heavily pretreated disease responding when highly matched speaks to the importance of personalized precision medicine combination approaches," says the study's senior author, Dr. Razelle Kurzrock.

"Our next step is to determine if we can increase the benefit rate further if this strategy is instituted earlier in the course of the disease," adds Dr. Kurzrock.

'No two tumors are exactly the same'

In total, 83 participants received treatments, informed by their oncologists' advice and their own preferences. Of these, 10 received unpersonalized treatments that did not match their tumor mutations.

The 73 individuals who accessed personalized combination therapies received a mix of treatments including gene product-targeted drugs, hormone therapies, immunotherapies, and chemotherapies.

"The percentage of patients matched was much higher than in most precision medicine studies because we implemented a team who instituted immediate review of genomic results, as well as navigators who helped patients and physicians access clinical trials and off-label [Food and Drug Administration (FDA)]-approved drugs," notes one of the study's lead authors, Dr. Shumei Kato.

There are, nevertheless, many concerns regarding the feasibility of the new approach. According to Dr. Sicklick, "Personalized multidrug therapies have not been used as standard treatment because there are concerns about the safety of administering drug combinations that have not been previously studied together."

In the current study, the researchers monitored the treatment outcomes until a participant's cancer developed further, until they no longer tolerated the therapy, or until they passed away.

At the same time, however, the first author argues that it is important to lean toward as personalized an approach to cancer therapy as possible.

"Personalized combinations are necessary, since no two tumors are exactly the same and so no two regimens will be the same," emphasizes Dr. Sicklick.

"Our findings demonstrate that this approach is feasible and safe when patients are monitored closely and started on reduced doses," he suggests.

Yet, the researchers admit that future clinical studies must further test this method and confirm its viability.

Furthermore, many of the study team members have acknowledged that they received research funds from various pharmaceutical and clinical research companies, including Novartis Pharmaceuticals, Blueprint Medicines, Amgen, and Pfizer.

## **Plant-based diet**

### **Plant-based diet cuts heart failure risk by over 40 percent (Medical News Today: 20190424)**

<https://www.medicalnewstoday.com/articles/325011.php>

New research finds that sticking to a diet rich in fruits, vegetables, and fish can slash heart failure risk by 41 percent. By contrast, a diet rich in fats, fried foods, processed meat, and sugary drinks can raise the risk of this condition.

male hands eating tomato salad

Adding more vegetables to our plate could keep heart failure at bay.

Heart failure occurs when the heart cannot supply enough blood and oxygen to the main organs in the body.

The condition affects about 5.7 million people in the United States and approximately 26 million people worldwide.

Some experts predict that heart failure will become more and more prevalent worldwide, which has led them to refer to it as a "global pandemic."

However, emerging evidence suggests that a diet consisting mainly of fruits and vegetables can prevent cardiovascular disease. Now, a new study strengthens this idea.

Dr. Kyla Lara, a cardiology fellow at the Mayo Clinic in Rochester, MN, and her colleagues, have examined the associations between five major dietary patterns and the risk of heart failure among people without any known history of heart disease.

Dr. Lara and her team published the results of their study in the Journal of the American College of Cardiology.

The effect of diets on heart failure

The researchers examined data available from the Reasons for Geographic and Racial Differences in Stroke (REGARDS) study. Namely, they looked at the dietary patterns among 16,068 black and white people who were 45 years old, on average.

The participants answered a 150-item survey, which included 107 food items. The researchers grouped the foods into five dietary patterns:

"convenience" diets, which consisted of meat-heavy dishes, pasta, pizza, and fast food

"plant-based" diets, consisting mainly of vegetables, fruit, beans, and fish

"Southern" diets, which comprised a significant amount of fried foods, processed meat, eggs, added fats, and sugary drinks

"alcohol/salads" diets, which included lots of wine, liquor, beer, leafy greens, and salad dressing.

How can a vegan diet improve your health?

How can a vegan diet improve your health?

A vegan diet may promote certain gut hormones that help us stay healthy.

Dr. Lara and team followed the participants for 8.7 years on average, during which time, 363 people spent time in the hospital for heart failure for the first time.

Of these, 133 people had heart failure with preserved ejection fraction, and 157 had heart failure with reduced ejection fraction. The former refers to a form of heart failure in which the ejection fraction — a measure of how well the heart is pumping blood — is "normal," or "preserved."

Plant-based diets slash heart failure risk

Overall, the researchers found that adhering to the Southern diet increased the risk of hospitalization due to heart failure by 72 percent.

But when the researchers adjusted for body mass index (BMI), "waist circumference, hypertension, dyslipidemia, diabetes mellitus, atrial fibrillation, and chronic kidney disease," this association became no longer statistically significant.

This could mean that the Southern diet raises heart failure risk by increasing obesity and abdominal fat, explain the researchers.

Importantly, the researchers found that the risk of heart failure hospitalizations was 41 percent lower among people who adhered to the plant-based diet.

Finally, the researchers found no statistically significant associations among heart failure risk and the other three dietary patterns.

"Adherence to a plant-based dietary pattern was inversely associated with incident [heart failure] risk, whereas the Southern dietary pattern was positively associated with incident [heart failure] risk," conclude the researchers, who also outline some strengths and limitations to their study.

The researchers say that the socio-economically and demographically diverse study sample made the associations stronger. However, the study participants may have wrongly estimated their dietary intakes, which may have biased the results.

Also, the researchers examined the participants' diets only at the beginning of the study, and these dietary habits may have changed throughout the study period.

In a linked editorial, Dr. Dong Wang, a research fellow at the Harvard T.H. Chan School of Public Health in Boston, MA, comments on the significance of the findings, "This study represents an important step forward in establishing a robust evidence base for the dietary prevention of heart failure."

"The need for population-based preventive strategies for heart failure is critical [...] These findings support a population-based dietary strategy for lowering the risk of incident heart failure."

## **Hormone**

### **Study identifies a hormone that may hinder weight loss ((Medical News Today: 20190424)**

<https://www.medicalnewstoday.com/articles/325009.php>

A series of experiments in mice demonstrates that a well-known hormone might have a previously unidentified role in the metabolic response to energy restriction during weight loss.

Woman in laboratory

A recent study finds a new role for an old hormone.

Scientists have known about growth hormone (GH) for several decades. It plays a role in bone growth and is particularly important as our bodies grow.

It also helps maintain organs and tissues as we go through our adult lives.

However, researchers at the University of São Paulo in Brazil have found an entirely new and unexpected role for GH: It appears to play a part in energy conservation during weight loss.

José Donato Junior and his team published their findings in the journal *Nature Communications*.

When an animal's food intake becomes restricted, its body responds by conserving energy.

This mechanism is important because, in the wild, if an animal is having difficulty finding food, the body needs to save as much energy as possible.

However, this is part of the reason why it is incredibly difficult to prevent weight from returning after dieting. For many years, researchers have tried to zero in on why this might be the case.

Hormones and weight loss

Scientists already know that a hormone called leptin plays a part in the body's response to weight loss. Fat cells produce leptin, which inhibits hunger. When we lose weight, levels of leptin in the bloodstream drop, making us more likely to feel hungry.

Some people can develop leptin resistance, which means that they no longer respond to the hormone and, consequently, feel hungry more often.

As Donato explains, "Leptin has hitherto been considered the main hormone that acts to conserve energy when we're hungry."

However, despite scientists' growing understanding of leptin, it has not led to any successful weight-loss interventions. The most recent study asks whether GH might be one of the missing pieces of the puzzle.

"GH receptors are found in large quantities in muscle and tissue, in the liver, and in organs directly involved in growth metabolism," says Donato, "but we found that the brain is also full of GH receptors. This is entirely new."

The scientists demonstrated that leptin levels decrease in response to a restriction in caloric intake, while levels of GH increase.

Where are the GH receptors?

The scientists found an abundance of GH receptors in the hypothalamus. The hypothalamus regulates the autonomic nervous system, which is the arm of the nervous system that controls automatic functions, such as breathing and digestion.

The hypothalamus also plays an important role in controlling energy homeostasis — the regulation of energy expenditure and food intake.

In the hypothalamus, a small collection of neurons produce agouti-related protein (AgRP). When these neurons release AgRP into the body, appetite increases, and the body holds onto its energy stores more tightly.

The scientists found that GH receptors in the hypothalamus activate these neurons, triggering the release of AgRP.

To understand what influence GH might be having on AgRP neurons, the researchers genetically engineered a strain of mice that lacked the AgRP-specific GH receptor (AgRP GHR KO mice).

Weight loss: 'Telling someone to improve their diet doesn't work'

Weight loss: 'Telling someone to improve their diet doesn't work'

A new study suggests that advising someone to lose weight does not empower them to succeed in their weight-loss efforts.

In a series of experiments, the scientists deprived mice of food and assessed their energy expenditure.

The control mice, which still had the GH receptor, responded to restricted food intake as expected by reducing their energy expenditure.

However, in the AgRP GHR KO mice, the drop in energy expenditure was much less pronounced. Consequently, these mice lost more weight over the course of the study. The loss of energy-dense fatty tissue accounted for most of this weight decrease, but there was also some loss of lean mass, which includes muscle, bone, organs, tendons, and fluids.

Blocking growth hormone

In a separate experiment, the researchers used mice that they had not engineered to lack the GH receptor. This time, they used a drug called pegvisomant that blocks GH receptors instead.

Once again, with food deprivation, the energy expenditure of these mice decreased significantly less than it did in mice that had not received pegvisomant.

"GH is not only involved in growth metabolism but, above all, influences the metabolic responses that conserve energy when we're hungry or on a diet," concludes Donato.

"In other words, we discovered that weight loss triggers an increase in hypothalamus GH levels, which activates the AgRP neurons, making weight loss harder and intensifying the sense of hunger. That's precisely the same function leptin performs."

Lead author José Donato Junior

The authors conclude that GH does not appear to play a significant role in energy balance when the animals have adequate access to food. Instead, it "signals energy deficiency to the brain, triggering neuroendocrine responses to conserve body energy stores."

Donato explains that because conserving energy is so important for survival, animals appear to have evolved two separate systems.

The authors also hypothesize that this might be why weight-loss interventions based solely on leptin are ineffective — they are only addressing part of the mechanism.

In the future, the authors believe that compounds that target GH receptors could "represent a promising approach to facilitate weight loss and improve the efficacy of obesity treatments."

## **Osteoarthritis**

### **Using stem cells to combat osteoarthritis (Medical News Today: 20190424)**

<https://www.medicalnewstoday.com/articles/324979.php>

In a recent preliminary study, scientists used stem cells to ease osteoarthritis. Although the trial was small-scale, the results are promising and will pave the way for larger studies.

Doctor checking patient's knee

A recent pilot study investigates stem cells as a potential treatment for osteoarthritis.

Osteoarthritis of the knee (KOA) occurs when the cartilage — the joint's natural cushioning system — breaks down in the knee.

Without this buffer, bones can come into contact with each other, causing pain, stiffness, and a loss of flexibility.

According to the Centers for Disease Control and Prevention (CDC), osteoarthritis affects an estimated 30 million people in the United States.

Osteoarthritis is predominantly a disease of older age, affecting more than one in 10 people over the age of 60 years.

As the population of the U.S. is slowly aging, the number of people with osteoarthritis is likely to increase steadily.

Although physical interventions and medications can ease symptoms, there is currently no cure because it is not possible to regrow cartilage. Once KOA has progressed to the end stages, the only option is surgical replacement of the joint.

Stem cells and osteoarthritis

Recently, a group of researchers from the Krembil Research Institute, University Health Network in Toronto, Canada looked into the potential use of stem cells to treat KOA. They published their results in the journal *STEM CELLS Translational Medicine*.

The scientists wanted to know whether it might be possible to regenerate knee cartilage using mesenchymal stromal cells (MSCs). These cells can develop into a number of different cell types, including muscle, bone, and, importantly, cartilage.

In all, the team recruited 12 participants with moderate-to-severe KOA and extracted MSCs from each person's bone marrow. In this pilot study, one of the main aims was to understand what constituted a safe and viable dosage, so the researchers injected each participant with one of three different doses of MSCs.

This 'caterpillar fungus' may help treat osteoarthritis

This 'caterpillar fungus' may help treat osteoarthritis

A parasitic fungus that infects insects could hold the key to better treatments for osteoarthritis.

READ NOW

Over the next 12 months, the scientists followed the participants, assessing their progress using a battery of tests. For instance, they measured the levels of inflammatory biomarkers and the rate of cartilage breakdown, and they took regular MRI scans of the affected joints. They also asked the individuals to rate how well they felt they were doing.

By the end of the year-long study, the team found that there was a significant reduction in pain and an increase in self-reported quality of life.

The participants tolerated all three doses well, and there were no serious adverse events. Those who received the highest doses experienced the most positive results.

There was a significant reduction in inflammation within the knee joints of the participants, which is important because experts now consider inflammation to be an important driver of osteoarthritis. The authors write:

"Pro-inflammatory monocytes/macrophages and interleukin 12 levels decreased in the synovial fluid after MSC injection."

In fact, the authors believe that much of the pain relief might be due to this anti-inflammatory response.

#### Shortfalls and next steps

As they were carrying out a pilot study, the scientists only recruited a small group of participants. Researchers will need to carry out much larger trials before it is possible to use the technique in real-world patients.

It is also worth noting that although the intervention reduced pain and inflammation, the scientists did not detect any cartilage regrowth, which some earlier trials have reported. This finding, the authors believe, might be because the trial only included participants with end-stage osteoarthritis. They suggest that "such regenerative effects are more likely to be observed in earlier-stage [osteoarthritis]."

Also, the pilot study was open-label, meaning that both the researchers and the participants knew who was receiving which dosage.

However, reservations aside, the investigators did not design the study to offer conclusive evidence that the method is effective. Instead, it acts as a stepping stone toward future endeavors.

Also, this is not the first time that researchers have pitted stem cells against osteoarthritis. For instance, the authors of a 2015 study involving 30 participants concluded that "MSC therapy may be a valid alternative for the treatment of chronic knee osteoarthritis."

A 2016 study with 60 participants reached similar conclusions.

"This clinical pilot study advances the field of stem cell research for patients with arthritis, showing safety and giving insights into potential therapy efficacy guidelines. We look forward to larger scale trial results."

Dr. Anthony Atala, Editor in Chief of STEM CELLS Translational Medicine

If more extensive projects can replicate the benefits that these small-scale preliminary studies have revealed, stem cells could become the future of osteoarthritis treatment.

## **Breast cancer**

**Breast cancer: Reducing this amino acid could make drugs more effective (Medical News Today: 20190424)**

<https://www.medicalnewstoday.com/articles/325007.php>

Leucine, an amino acid that the body needs for making protein, appears to have a surprising role in the development of resistance to tamoxifen in breast cancer that tests positive for the estrogen receptor.

scientist looking through microscope

New research in cell cultures finds that lower levels of dietary leucine may improve the effectiveness of cancer drugs.

Scientists from Harvard Medical School, in Boston, MA, recently made this "unexpected" discovery about estrogen receptor-positive (ER-positive) breast cancer in a study conducted with colleagues from other research centers.

In laboratory experiments, they also found that the cell surface protein SLC7A5, which helps cells to take in leucine, influences the response of ER-positive breast cancer cells to tamoxifen.

The study authors note, in a paper published in *Nature*, that "SLC7A5 was necessary and sufficient to confer resistance to tamoxifen treatment" and suggest that the protein could be a potential target for "overcoming resistance" to tamoxifen in ER-positive breast cancer.

In around three-quarters of breast cancers, the hormone estrogen helps the tumors grow and spread.

This is because the cancer cells, like healthy breast cells, have estrogen receptors that allow them to receive growth signals from the hormone.

Doctors commonly treat ER-positive breast cancer with the drug tamoxifen because it blocks the action of estrogen in the cancer cells.

Tamoxifen resistance and leucine

However, while ER-positive breast cancers may respond to tamoxifen, in many cases they develop resistance to the drug, raising the risk of recurrence and metastasis, or spread.

"Patients with ER-positive breast cancer who develop endocrine-resistant and metastatic cancer have very poor life expectancy," says lead study author Senthil K. Muthuswamy, Ph.D., an associate professor of medicine at Harvard Medical School.

Because there are limited alternative treatment options, the average survival of these patients is "usually less than 5 years," he adds.

Amino acids are the building blocks that the body uses to make proteins. There are 20 of them in all. Of these, nine are essential, that is, the body must source them from food because it cannot make them itself.

Leucine is an essential amino acid that is especially important for making muscle protein. In general, apart from maize, plant foods contain less leucine than foods from animal origin. Pork, fish, chicken, and beef are examples of foods that have higher levels of leucine.

### Reducing leucine stopped tumor growth

The fact that cells cannot synthesize leucine gave the researchers the opportunity to explore the reaction of ER-positive breast cancer cells to different levels of the amino acid that they could control.

Laboratory experiments using cultures of ER-positive breast cancer cells from human samples showed that reducing leucine stopped tumor cell division, while increasing it promoted cell division.

Risk of breast cancer's return continues long after treatment ends

Risk of breast cancer's return continues long after treatment ends

Though a person may be free from ER-positive breast cancer after 5 years of endocrine therapy, the cancer may return in the long term.

Muthuswamy says that these results point to the possibility of developing dietary interventions to help those with ER-positive breast cancer.

However, he cautions that the findings do not "imply that animal proteins will enhance growth of breast cancer cells." All they show is that reducing leucine in the diet could be of benefit to people with ER-positive breast cancer.

He and his team have already started another study to find out whether restricting dietary leucine can reduce tumor growth or boost treatment response in a mouse model of ER-positive breast cancer.

### The role of SLC7A5 in tamoxifen resistance

In a final set of experiments, the team examined the effect of leucine levels on ER-positive breast cancer cells that had developed resistance to tamoxifen. These experiments revealed that resistant cells continued to grow, even when leucine levels were low.

On closer examination, the scientists found that the tamoxifen-resistant cells had higher levels of SLC7A5. Higher levels of this ferrying protein were helping the cells to take in more leucine, even when it was scarce.

In a final set of tests on mice, the researchers found that blocking SLC7A5 caused the animals' ER-positive tumors to shrink.

"A properly controlled clinical study to assess clinical benefit of actively decreasing leucine intake in diet during treatment for ER-positive breast cancer will be of significant value because

a positive outcome can provide a simple intervention strategy that can help us better care for [these] patients."

## **Malaria vaccine**

### **World's first malaria vaccine launched in Africa: WHO (New Kerala: 20190424)**

<https://www.newkerala.com/news/read/132159/worlds-first-malaria-vaccine-launched-in-africa-who.html>

The world's first and only malaria vaccine was launched in the African country of Malawi on Tuesday, as part of a landmark pilot program hoping to protect, in particular, hundreds of thousands of children under five against one of the world's leading killers, according to the World Health Organization (WHO).

Thirty years in the making, RTS,S is the first and to date the only vaccine that has demonstrated it can significantly reduce malaria in children, according to the WHO.

In clinical trials, the vaccine was found to prevent about four in ten malaria cases, including three in ten cases of life-threatening severe malaria, reports Xinhua news agency.

Malawi is the first of three in Africa where RTS,S is to be made available to children up to two years of age. Ghana and Kenya will introduce the vaccine in the coming weeks.

According to WHO Director-General Dr. Tedros Adhanom Ghebreyesus, despite tremendous gains from bed nets and other measures to control malaria in the last 15 years, progress has stalled and even reversed in some areas. The vaccine may serve as a new solution that will potentially save tens of thousands of children's lives.

While celebrating the launch of the vaccine, the WHO also reminds that it's a complementary malaria control tool added to the core package of WHO-recommended measures for malaria prevention, including the routine use of insecticide-treated bed nets, indoor spraying with insecticides, and the timely use of malaria testing and treatment.

An outcome of public-private partnership under the WHO's coordination, the pilot vaccine program is designed to generate evidence and experience to inform WHO policy recommendations on the broader use of the vaccine.

It will look at reductions in child deaths; vaccine uptake, including whether parents bring their children on time for the four required doses; and vaccine safety in the context of routine use.

Malaria remains one of the world's leading killers, claiming the life of one child every two minutes, according to WHO statistics. Most of these deaths are in Africa, where more than 250,000 children die from the disease every year.

Children under five are at greatest risk of its life-threatening complications. Worldwide, malaria kills 4,35,000 people a year, most of them children.

## **Mental effort**

### **Empathy is often avoided as it requires mental effort: Study (New Kerala: 20190424)**

<https://www.newkerala.com/news/read/132093/empathy-is-often-avoided-as-it-requires-mental-effort-study.html>

: People avoid empathising with others as they think it requires too much mental effort, a study has found.

The study published in the Journal of Experimental Psychology General, included 11 experiments with more than 1,200 participants.

Empathy is the ability to understand the feelings of another person, is often viewed as a virtue that encourages helping behaviours. But people often don't want to feel empathy.

"There is a common assumption that people stifle feelings of empathy because they could be depressing or costly, such as making donations to charity," said lead researcher C Daryl Cameron.

"But we found that people primarily just don't want to make the mental effort to feel empathy toward others, even when it involves feeling positive emotions," Cameron added.

The researchers designed an "Empathy Selection Task" to test whether cognitive costs or mental effort, could deter empathy. Over a series of trials, the researchers used two decks of cards that each featured grim photos of child refugees.

For one deck, participants were told just to describe the physical characteristics of the person on the card. For the other deck, they were told to try to feel empathy for the person in the photo and think about what that person was feeling. Participants were told to choose freely from either deck in each trial.

In some additional experiments, the researchers used decks that featured images of sad or smiling people. When given the choice of choosing between decks, participants consistently picked the decks that didn't require feeling empathy, even for the photos of happy people.

"We saw a strong preference to avoid empathy even when someone else was expressing joy," Cameron said.

Across all the experiments, participants on average chose the empathy deck 35 per cent of the time, showing a strong preference for the deck that didn't require empathy.

Also, there were not any financial costs for feeling empathy in the study because no one was asked to donate time or money to support child refugees or anyone else featured in the photos.

In the survey questions after each experiment, most participants reported that empathy felt more cognitively challenging, saying it required more effort and that they felt less good at it than they did at describing the physical characteristics of other people.

Participants who reported that feeling empathy was mentally demanding or made them feel insecure, irritated or distressed were more likely to have avoided the empathy deck during the experiments.

Can people be encouraged to feel empathy if they think they are good at it?

In two experiments, half of the participants were told that they were better than 95 per cent of others on the empathy deck and 50 per cent better for the objective physical characteristics deck, while the other group was told the opposite.

Participants who were told they were good at feeling empathy were more likely to select cards from the empathy deck and report that empathy required less mental effort.

The cognitive costs of empathy could cause people to avoid it, but it may be possible to increase empathy by encouraging people that they can do it well, Cameron said.

"If we can shift people's motivations toward engaging in empathy, then that could be good news for society as a whole. It could encourage people to reach out to groups who need help, such as immigrants, refugees and the victims of natural disasters," Cameron said.

## **Alzheimer's disease**

### **50 million people worldwide living with Alzheimer's disease, finds study (New Kerala: 20190424)**

<https://www.newkerala.com/news/read/132074/50-million-people-worldwide-living-with-alzheimers-disease-finds-study.html>

It has been found in research that 50 million people worldwide are living with Alzheimer's disease and other symptoms related to memory loss.

According to the Alzheimer's Association, the disease is more communicable in the U.S.A wherein 65 seconds a person develops this disease. This disease results in memory loss, changes in thinking and behaviour.

The study was published in the journal 'Neurobiology of Disease'.

Locally, Alzheimer's disease affects 11.5 per cent of Medicare beneficiaries in Palm Beach County and 12.7 per cent of Medicare beneficiaries in Broward County (a nearly 18 per cent increase over the national average).

According to the Alzheimer's Association, Florida is number one in per capita cases of Alzheimer's disease in the U.S.

It has been more than 100 years since Alois Alzheimer a German psychiatrist and neuropathologist, first reported the presence of senile plaques in the brain of an Alzheimer disease patient. It led to the discovery of amyloid precursor protein that produces deposits of amyloid fragments in the brain which is the suspected culprit of Alzheimer's disease. Since then, the amyloid precursor protein has been extensively studied because of its association with Alzheimer's disease.

A team of neuroscientists sought to answer a fundamental question in their quest to combat Alzheimer's disease -- "Is amyloid precursor protein the mastermind behind Alzheimer's disease or is it just a conspirator?"

Mutations found in amyloid precursor protein have been linked to rare cases of familial Alzheimer's disease. Although scientists have researched a lot to find about how this protein turns into amyloid plaques, little is known about its native function in neurons. In the case of more common occasional Alzheimer's disease, the highest genetic risk factor is a protein that is involved in cholesterol transportation and not this amyloid precursor protein.

In the study, the researchers tackle this Alzheimer's disease mystery by devising a multi-functional reporter for amyloid precursor protein and tracking the protein's localization and mobility using quantitative imaging with unprecedented accuracy.

For the study, the researchers and collaborators from other institutes genetically disrupted the interaction between cholesterol and amyloid precursor protein. Surprisingly, by removing the two, they discovered that this manipulation not only distorts the trafficking of amyloid precursor protein but also messes up cholesterol distribution at the neuronal surface.

"Our study is intriguing because we noticed a peculiar association between amyloid precursor protein and cholesterol that resides in the cell membrane of synapses, which are points of contact among neurons and the biological basis for learning and memory," said one of the key researchers of the study. Adding, he said, "Amyloid precursor protein may just be one of the many accomplices partially contributing to cholesterol deficiency. Strangely, the heart and brain seem to meet again in the fight against bad cholesterol."

The researchers who found out about the involvement of cholesterol in almost all aspects of neurons' have proposed a new theory about the amyloid precursor protein connection in Alzheimer's disease.

Indian women at high death risk from diabetes: Study

Diabetes has reached epidemic proportions in Asia - led by India and China -- and has dramatically increased the risk of premature death especially among women and middle-aged people, a significant study has found.

India and China today have the highest diabetes burdens in the world.

According to the World Health Organization (WHO), India has close to 62 million people living with the diseases and is projected to have close to 70 million diabetics by 2025.

Throughout Asia, more than 230 million people are living with diabetes.

"Given the increased prevalence of obesity and rapid adoption of a westernized lifestyle in Asia, that figure is expected to exceed 355 million by 2040," said the study led by the Vanderbilt University Medical Center in Nashville, Tennessee.

The researchers found that patients with diabetes are at a substantially elevated risk of premature death.

"The risk associated with diabetes is much higher than that reported by most previous studies conducted in the US and Europe," said the study's corresponding author Wei Zheng in a paper reported in the journal JAMA Network Open.

The Vanderbilt-led research team pooled 22 prospective cohort studies in multiple countries from mainland China to Bangladesh.

More than one million individuals were followed for an average of 12.6 years.

Diabetes was associated with a nearly two-fold increase in the risk of death from all causes.

"The diabetes-related risk of death from all causes was particularly high for women and patients who were diagnosed with diabetes when they were middle-aged adults," the findings showed.

This result is particularly relevant for certain racial and ethnic groups in the US, including Asian Americans, who are more susceptible to insulin resistance and are at higher risk of developing diabetes at a relatively lower obesity level than are people of European ancestry.

"Whether this may increase their risk of premature death once they develop diabetes has not yet been determined," said Zheng.

Lack of access to diabetes care in Asia may contribute to the unusually higher risk of premature death among diabetes patients in the study, the researchers noted.

"There is an urgent need to implement diabetes management programmes tailored to Asian populations," they added.

## Elderly People (Hindustan: 20190424)

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[http://epaper.livehindustan.com/imageview\\_52528\\_64628826\\_4\\_1\\_24-04-](http://epaper.livehindustan.com/imageview_52528_64628826_4_1_24-04-)

आर्थोपेडिक विभाग में इसके लिए लैब की शुरुआत की गई, 'सेव द हिप इनिशिएटिव' कार्यक्रम में आठ हफ्ते का प्रशिक्षण देंगे

# बुजुर्गों को संतुलन बनाकर चलने का तरीका सिखाएगा एम्स

## पहल

नई दिल्ली | विश्व स्वास्थ्य

एम्स ने एक ऐसा खास लैब तैयार किया है जो बुजुर्गों के गिरने के खतरे की पहचान कर उन्हें शरीर का संतुलन बनाना सिखाएगा। इसका उद्देश्य बुढ़ापे में लोगों को गिरने से बचाने और कुल्हा टूटने जैसी समस्याओं से बचाना है। एम्स के आर्थोपेडिक विभाग की

## गिरने की वजह से 20 फीसदी बुजुर्ग अस्पताल आते हैं

डॉक्टर राजेश मल्होत्रा ने बताया कि 80 वर्ष से अधिक उम्र वाले 50 फीसदी बुजुर्ग साल में कम से कम एक बार जरूर गिरते हैं। इस वजह से करीब 20 फीसदी बुजुर्गों को अस्पताल पहुंचाने की जरूरत पड़ती है और 10 फीसदी बुजुर्गों को इस के कारण फ्रेक्चर हो जाता है। कई लोगों को ब्रेन इंजुरी हो जाती है इसलिए बुढ़ापे में गिरना मौत का बड़ा कारण है।

ओर से शुरू किए गए इस लैब की शुरुआत मंगलवार को निदेशक रणदीप गुलेरिया ने की। एम्स के आर्थोपेडिक विभाग के विभागाध्यक्ष डॉ. राजेश मल्होत्रा ने बताया कि

बुढ़ापे में गिरने के कई कारण होते हैं। बुढ़ापे में बीमारियों के कारण ज्यादा दवाएं लेने, आंखों से कम दिखाई देने या किसी न्यूरो रोग से पीड़ित होने पर गिरने का खतरा अधिक रहता है।

एम्स की इस पहल को सेव द हिप इनिशिएटिव नाम दिया गया है।

## मशीनों की मदद ली जाएगी :

डॉक्टर राजेश मल्होत्रा ने बताया कि लैब में करीब एक दर्जन मशीनें व उपकरण लगाए गए हैं। इन मशीनों से गिरने के जोखिम को पहचान के लिए कई तरह की जांच की जाती है। उदाहरण के लिए मरीज को कुर्सी से खड़ा कर 600 मीटर पैदल चल कर वापस कुर्सी पर बैठने के लिए कहा जाता है। इस दौरान यह देखा जाता है कि इसमें कितना समय लगता है।

इसके अलावा लैब में बैलेंस मास्टर मशीन लगाई गई है, जिसे बुजुर्गों के शरीर के संतुलन की जांच की जाती है। इसके बाद संभावित खतरे वाले बुजुर्गों को आठ सप्ताह तक प्रशिक्षण दिया जाएगा। इसके लिए फिजियो बॉल, ट्रेपलिन सहित कई उपकरण हैं, जिसके माध्यम से वे संतुलन बनाना सीख सकेंगे। इसके अलावा मांसपेशियों को मजबूत करने के लिए उपकरण लगाए गए हैं। आठ सप्ताह बाद जांच जाएगा कि संतुलन क्षमता बढ़ी है या नहीं।

## Human Brain (Hindustan: 20190424)

[http://epaper.livehindustan.com/imageview\\_52543\\_94527236\\_4\\_1\\_24-04-](http://epaper.livehindustan.com/imageview_52543_94527236_4_1_24-04-)

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# अब इंसानी दिमाग से जोड़ा जाएगा इंटरनेट



तकनीक

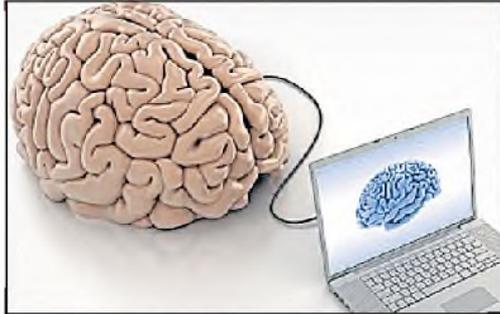
नई दिल्ली | हिंदी

भविष्य में इंसानी दिमाग दुनिया भर की जानकारी और आर्टिफिशियल इंटेलिजेंस के बारे में सोचते ही सब कुछ जान जाएगा। एक नए शोध में यह दावा किया गया है कि आने वाले कुछ दशकों में इंसान का दिमाग सीधा इंटरनेट से जुड़ जाएगा। इंसान के सिर्फ सोचने भर से ही हर जानकारी और हर तरह की कंप्यूटिंग उन्हें तुरंत पता चल जाएगी।

**नई तकनीक का होगा इस्तेमाल :**

वैज्ञानिकों ने दावा किया है कि कुछ दशकों बाद एक ऐसी तकनीक आ जाएगी जिसकी मदद से इंसानों का दिमाग सीधा इंटरनेट से जोड़ा जा सकेगा। प्रमुख शोधकर्ता रोबर्ट फ्रेटिस जूनियर ने कहा, इंसान के दिमाग और इंटरनेट को जोड़ने के लिए न्यूरल नैनोरोबोट का इस्तेमाल किया जाएगा।

यह इंसानी शरीर में प्रत्यारोपित किए जाएंगे और रियल टाइम में नेटवर्क से जुड़ सकेंगे। उन्होंने बताया कि यह उपकरण शरीर की तंत्रिकाओं को पार कर, रक्त और दिमाग की बाधा को पार कर अपने आप को दिमाग की कोशिकाओं के अंदर स्थापित कर सकते हैं। यह वायरलेस



- न्यूरल नैनोरोबोट का इस्तेमाल किया जाएगा इस तकनीक में
- शरीर में प्रत्यारोपित किए जाएंगे नैनोरोबोट

## तकनीक विकसित करने में चुनौती

इस तकनीक के विकास में सबसे बड़ी बाधा सुपर कंप्यूटर और दिमाग के बीच न्यूरल नेटवर्क के जरिए डाटा का आदान-प्रदान करना है। शोधकर्ताओं के अनुसार इन नैनोपार्टिकल को शरीर के सर्कुलेशन सिस्टम के द्वारा दिमाग तक पहुंचाना सबसे बड़ी चुनौती है।

उपकरण रियल टाइम में जानकारी या डाटा को एक क्लाउड आधारित सुपर कंप्यूटर और दिमाग के बीच आदान प्रदान करने में सक्षम करता है।

**दिमाग में डाउनलोड होगी**

**जानकारी:** यूसी बर्कले और यूएस के इंस्टिट्यूट ऑफ मॉलिक्यूलर मैन्युफैक्चरिंग के शोधकर्ताओं के अनुसार इस नई तकनीक से मैट्रिक्स फ़िल्म में दिखाए गए सीन के जैसे ही दिमाग में जानकारी डाउनलोड की जा सकेगी। इस तकनीक से दिमाग को क्लाउड पर उपलब्ध सारी जानकारी आसानी से मिल सकेगी। इससे दिमाग के सीखने की क्षमता और बुद्धिमत्ता

बढ़ेगी। इस तकनीक से एक ग्लोबल सुपर ब्रेन बना सकते हैं जो व्यक्तिगत दिमागों के नेटवर्क और एआई से जुड़कर संयुक्त विचार को बढ़ावा दे सकते हैं।

**ह्यूमन ब्रेन नेट सिस्टम का परीक्षण:**

वैज्ञानिक एक्सपेरिमेंटल ह्यूमन ब्रेन नेट सिस्टम का परीक्षण कर रहे हैं। इसके जरिए क्लाउड और इंसानी दिमाग के बीच डाटा एक्सचेंज किया जा रहा है। यूसी बर्कले के डॉक्टर नुनो मार्टिन्स ने कहा कि न्यूरल नैनो रोबोटिक्स के विकास से ऐसा सुपर ब्रेन बनाया जा सकता है जो रियल टाइम में कई इंसानी दिमागों और मशीनों के सोचने को क्षमता को उपयोग कर सकता है।

## Obesity

याददाशत को प्रभावित करता है मोटापा(Hindustan: 20190424)

[http://epaper.livehindustan.com/imageview\\_52543\\_94527880\\_4\\_1\\_24-04-2019\\_i\\_22.pagezoomsinwindows.php](http://epaper.livehindustan.com/imageview_52543_94527880_4_1_24-04-2019_i_22.pagezoomsinwindows.php)



वाशिंगटन | एजेसी

मोटापे के कारण हमारे खून और दिमाग के बीच का अवरोध टूट सकता है जिससे सीखने की क्षमता और याददाशत प्रभावित हो सकती है। एक शोध में यह दावा किया गया है।

वैज्ञानिकों के अनुसार दिमाग और खून के बीच इंडोथेलियल कोशिकाओं में मौजूद अडोरा2 ए (जो अवरोध का काम करती है) के टूटने से खून दिमाग में रिसता है और इससे हमारे दिमाग की कोशिकाओं की कार्यक्षमता प्रभावित होती है।

अमेरिका की अगस्ता यूनिवर्सिटी के टीम ने अपने शोध में दर्शाया है कि डाइट की वजह से होने वाले मोटापे के मॉडल में जब अडोरा2 ए को ब्लॉक किया गया तब यह महत्वपूर्ण अवरोधक कार्यप्रणाली नियंत्रण में रही। न्यूरोसाइंटिस्ट एलेक्सिस एम स्ट्रैनेहेन ने कहा, हमें पता है कि मोटापे और

## शोध

- मोटापा के कारण खून और दिमाग के बीच का अवरोध टूट जाता है
- दिमाग कार्यक्षमता में कमी से सीखने की क्षमता प्रभावित होती है



इंस्यूलिन प्रतिरोध के कारण दिमाग और खून के बीच का अवरोध टूट जाता है, लेकिन यह क्यों होता है इसका पता नहीं था। यह शोध पत्रिका जर्नल ऑफ न्यूरोसाइंस में प्रकाशित हुई है।

दिमाग में मौजूद एडोनोसिन हमें सोने में और हमारे रक्तचाप को नियंत्रित रखने में मदद करती है। एडोनोसिन अडोरा1 ए और अडोरा2 ए रिसेप्टर को भी सक्रिय कर दिमागी कार्यप्रणाली और खून के बहाव के बीच स्वस्थ रिश्ता बनाए रखने में मदद करते हैं।

मोटापे के कारण एडोनोसिन की मात्रा बढ़ती है जिससे अडोरा रिसेप्टर अति सक्रिय हो जाते हैं और दिमागी कार्यप्रणाली में बाधा आती है। जिन

व्यक्तियों को मोटापा और मधुमेह दोनों है उनकी सीखने की क्षमता और याददाशत दोनों ही अन्य लोगों की तुलना में कम होती जाती है।

**कैसे किया शोध :** इस शोध के लिए चूहे को वसायुक्त खाना खिलाया गया। 16 हफ्ते तक लगातार ऐसा खाना खाने पर वह मोटापे और मधुमेह का शिकार हो गया। शोध के दौरान पाया गया कि मोटापे के कारण चूहों के दिमाग के हिपोकैप्स में ब्लड ब्रेन अवरोध के बीच प्रवेश बढ़ गया। इसके कारण फ्लोरोफोर सोडियम फ्लोरोसिन और इवंस ब्लू जैसे अणु दिमाग में प्रवेश करने लगे। इससे सीखने की क्षमता और याददाशत प्रभावित होती है।