



# Drug News

News item curated by Jay Tatiya, Guided by Dr Vaibhav Vaidya

## **NPPA**

National medication valuing controller NPPA has fixed the costs of 36 formulations, including those utilized for treatment of malignant growth, diabetes, contaminations, asthma, seizures, aggravation and torment, among others. In a notice, the National Pharmaceutical Pricing Authority (NPPA) said it has fixed retail costs of 22 dosages and has modified maximum cost of 14 final products.

Among the dosages whose maximum price have been fixed incorporate Budesonide inhalation used for asthma and Gentamicin infusion utilized for treatment of bacterial diseases. The products whose retail costs have been fixed include Trastuzumab infusion for treatment of metastatic bosom disease and gastric malignancy and Metformin in addition to Gliclazide tablets utilized for treatment of type 2 diabetes, among others.

## **E- Pharmacy**

The Delhi High Court on Tuesday said its stay on special of medications and professionally prescribed drugs by online drug stores will proceed till standards are put in place to control such elements.

Chief Justice Rajendra Menon and Justice V K Rao said that "once the guidelines become possibly the most important factor, you (online drug stores) can begin selling it (prescriptions). Issue is that today there are no guidelines managing it".

During the consultation, the candidate educated the jury that the Madras High Court on Monday had restricted online clearance of prescriptions till the Union Health Ministry and the Central Drugs Standard Control Organization (CDSCO) framed the Drugs and Cosmetics Amendment Rules, 2018.

## PHYTOSOME: A NOVEL REVOLUTION IN HERBAL DRUGS

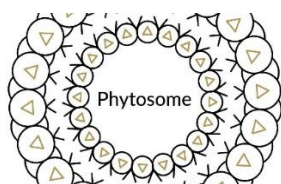
Curated by Sudhir Pandya, guided by Dr. Revan S. Karodi

Phosphatidyl choline used in preparation of phytosomes, besides acting as a carrier also acts as a hepatoprotective as a result it imparts a synergistic effect when hepatoprotective substances are employed

**ADVANTAGES OF PHYTOSOMES** - Phytosomes furnishes with the following advantages, Phytosomes produces a little cell where the valuable components of herbal extracts are protected from destruction by digestive secretions and gut bacteria.

Phytosomes shows better stability profile due to the formation of chemical bonds between phosphatidyl choline molecules and the phytoconstituents. Phytosomes can accommodate the active principle that is anchored to the polar head of the phospholipids, which finally becomes an integral part of the membrane. Phosphatidyl choline used in formulating phytosome process besides acting as a carrier also nourishes the skin as it is an essential part of a cell membrane. Phytosomes are complex between a natural phytoconstituents and natural phospholipids, like soy phospholipids mostly phosphatidyl choline. The nutrient safety of the herbal extracts need not be compromised by conveying the herbal drug as means of phytosomes.

Phytosomes are advanced form of herbal drugs which are better absorbed, utilized and which finally lead to better results than conventional dosage form. Phytosomes are lipophilic substances with definite melting point, freely soluble in non-polar solvents, and moderately soluble in fats. Phytosomes when treated with water assume a micellar shape, forming structure that resembles liposomes exhibiting fundamental difference. These highly water soluble constituents are poorly absorbed due to their poor lipid solubility, thus creating a hurdle to cross the highly lipid-rich biological membrane, which finally results in poor bioavailability. These studies encompass the current areas of research and the recent innovations that can be made possible in phytosomes. The phytosome process produces a little cell whereby the valuable plant extracts are protected from degradation by digestive enzymes and gut bacteria. Over the past century phytochemical and phyto-pharmacological sciences established the compositions, biological activities and health promoting benefits of herbal extracts and their derivatives. Phytosomes are also superior to liposomes in skin care products.





## **Sun Pharma launches Infugem injection for treatment of cancer in the US Reference: Business Today – curated by Dr. Sonali Mahaparale**

Sun Pharma said INFUGEM uses its proprietary technology which allows cytotoxic oncology products to be premixed in a sterile environment and supplied to the prescribers in ready-to-infuse final dosage bags

Drug major Sun Pharmaceutical Industries Monday announced launch of INFUGEM injection, used for treatment of cancer, in the US market.

In July 2018, Sun Pharma had received approval from the US health regulator for INFUGEM injection.

"INFUGEM (Gemcitabine in sodium chloride injection), for intravenous use, is now commercially available in the US," Sun Pharma said in a regulatory filing.

"INFUGEM, the first chemotherapy product that comes in a premixed, ready-to-infuse formulation, was approved by the US Food and Drug Administration (USFDA) in July 2018 in combination with other drugs for the treatment of breast, ovarian, non-small cell lung cancers, and as a single agent for the treatment of pancreatic cancer," the company added.

Sun Pharma said INFUGEM uses its proprietary technology which allows cytotoxic oncology products to be premixed in a sterile environment and supplied to the prescribers in ready-to-infuse final dosage bags.

# Zinc – Key to diabetes control –

The American Journal of Clinical Nutrition

<https://www.nutraingredients.com/Article/2019/07/05/New-research-Zinc-holds-diabetes-prevention-> curated by **Sudhir Pandya**

According to the report, a growing body of evidence supports an association between hyperglycemia and zinc metabolism. For example, many studies have provided evidence that low zinc status is associated with impaired insulin secretion, decreased insulin sensitivity, and increased inflammatory biomarkers.

Previous studies have also revealed significant differences between diabetic patients and healthy subjects with respect to blood concentrations of zinc, and patients with low zinc concentrations are more likely to have had diabetes for a longer time, have poorer glucose control, and have reduced pancreatic  $\beta$  cell function.

Results from previous meta-analyses suggest that zinc supplementation may exert a favourable effect on several plasma lipid parameters and some analyses have revealed that fasting glucose and glycated hemoglobin, are reduced following zinc supplementation.

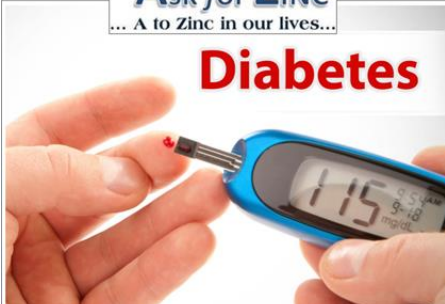
However, due to the limited amount of available data, the effects of zinc supplementation with respect to preventing or treating diabetes are currently inconclusive.

In recent years, a growing number of well-designed randomised controlled trials have focused on examining the putative effects of zinc supplementation on obesity, metabolic syndrome, prediabetes, and diabetes, thus providing important data regarding the relation between zinc supplementation and diabetes prevention and management.

However these studies varied with respect to several parameters, including sample size, the subjects' health status, and the dose and efficacy of the zinc supplementation, thereby leading to inconsistencies among studies.

**Ask for ZINC**  
... A to Zinc in our lives...

## Diabetes



**How does Zinc relate to diabetes ?**

Finnish researchers followed 1,050 adults with Type 2 diabetes for seven years. During that time, 156 participants died from heart disease and 254 had fatal or nonfatal heart attacks. Blood ZINC levels were lower in people who died from heart disease compared to those who survived. Possibly because ZINC has antioxidant properties and that may be useful in warding off heart disease in people with Type 2 diabetes.



## **3D Printing In the Pharmaceutical Industry (Author Jerry Martin)**

**Curated by Shivani Sontakke and Jayraj Deshmukh (M Pharm).**

**Guided by Sudhir Pandya**

3D-printing technology has the ability to transform the pharmaceutical industry with applications in controlled release, short-run medicines, and even the potential for on-site printing at pharmacies. Controlled Release, sometimes referred to as 4D pharmaceuticals because of their tendency to change shape during digestion or operate for extended times, is growing as patients' desire for convenience expands.

3D printing can also expedite the clinical trial process through speed and flexibility inherent in its ability to produce small batches of drugs with different compositions. Inkjet 3D-printing methods are of particular interest to the pharmaceutical industry because they have many parallels with current manufacturing processes and may offer a more efficient, longer-term printing solution. 3D printing also holds tremendous promise for orphan drugs, which are designed to treat rare diseases that are sometimes not developed by the pharmaceutical industry due to economic reasons. Although no good manufacturing practice guidelines have been administered for 3D-printed pharmaceuticals, the FDA established guidelines for 3D printing of medical device products in 2017. Studying the performance of different excipients in terms of the tablets and dissolution properties is much faster in 3D than using traditional manufacturing at a larger scale. With 3D printing, companies can create multiple versions of a drug for variant populations and produce them in short-run batches. Spritam, for eg has a highly porous structure that could not be achieved with traditional manufacturing. This structure causes the pill to dissolve in seconds upon contact with saliva, helping both elderly and young patients suffering from trouble swallowing pills. The reduced dosing frequencies extended-release products offer can increase patient compliance in those who take multiple doses of a drug per day—patients can take one pill in the morning instead of every few hours, or perhaps even one pill for a week or more. The capsule can be customized to deliver drugs, sense environmental conditions, or both, and can reside in the stomach for at least a month. Aprecia Pharmaceuticals was first to be approved by the FDA to produce the first tablet manufactured through 3D printing. The methods of 3D printing are quite varied, even within solid dosage drugs, making it too early to define best practices. Scientists recently designed a 3D-manufactured, ingestible electronic pill capsule that can be controlled using Bluetooth wireless technology and connected to the user's smartphone. In the example of Aprecia Pharmaceuticals, 3D printing was used to reformulate the anti-epileptic medication levetiracetam.



## Walking the best exercise

(<https://food.ndtv.com/health/benefits-of-walking-9-reasons-why-its-great-for-your-health>)

**Curated by Jay Tatiya. (T Y B Pharm) Guided by Sudhir Pandya**

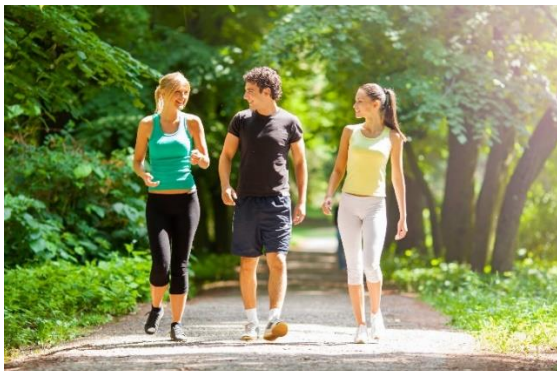
A study published in the journal Cancer Epidemiology, Biomarkers & Prevention, and conducted by the American Cancer Society found that walking up to 7 hours a week reduces the risk of breast cancer itself by 14%. According to the study walking for just 2.5 hours a week, which is 21 minutes a day can cut the risk of heart disease by 30%. Walking also boosts our immunity. A moderate speed walk for about 30 to 45 minutes daily can increase the number of immune system cells in our body and over a period of time, it can have really remarkable effect on your body's ability to fight disease. One to three hours walk a week reduces the risk of death from breast and uterine cancer by almost 19%, and walk for about three to five hours a week, they may reduce the risk of breast and uterine cancer to almost 54%. Over few years, researchers have spent a lot of time and resources to figure out how walking helps, how swift or slow you should walk and how it brings rhythm to our life that no other form of exercise can.

It has been suggested that brisk walking for 30 minutes at a moderate speed can help you burn 150 to 200 calories.

A 2014 study published in the Journal of the American Medical Association has shown that walking from an early age can help you stay mobile and independent during old age.

Walking for 40 minutes at a stretch three times in seven days could increase the volume of the hippocampus by 2%, which is fairly significant. A walk for at least 20 minutes a day could reduce the risk of getting sicker by almost 43%. Curb diabetes by walking. Good results can be seen when you can start out with 30 minutes or 2400 steps a day and take it up to 77 minutes or 6400 steps a day.

Another study that was presented shows that regular brisk walks slows down the shrinking of the brain and the old age faltering mental skills.



## Whitening products may cause tooth decay

([https://www.business-standard.com/article/news-ians/whitening-products-may-cause-tooth-decay-119041000713\\_1.html](https://www.business-standard.com/article/news-ians/whitening-products-may-cause-tooth-decay-119041000713_1.html))

**Curated by Rohit Katariya, (T Y B Pharm) Guided by Dr Pallavi Chaudhari**

Teeth-whitening products makes your smile brighter, but they might also lead to tooth damage, researchers have warned. Hydrogen peroxide -- the active ingredient in whitening strips -- can damage the protein-rich dentin tissue found beneath the tooth's protective enamel has been indicated by the study

Human teeth has three layers -- the outer tooth enamel, an underlying dentin layer and connective tissue that binds the roots to the gum. The new study focused on dentin unlike most studies which have focused on tooth enamel which makes up most of the tooth and has high levels of protein -- most of which is collagen.

It was demonstrated that the major protein in the dentin is converted to smaller fragments when treated with hydrogen peroxide. In additional experiments, they treated pure collagen with hydrogen peroxide and then analysed the protein using a gel electrophoresis laboratory technique that allows the protein to be visualized.

"Our results showed that treatment with hydrogen peroxide concentrations similar to those found in whitening strips is enough to make the original collagen protein disappear, which is presumably due to the formation of many smaller fragments," said Kelly Keenan, Associate Professor at the varsity.

It is unknown if the tooth damage is permanent because the researchers pointed out that their experiments did not address whether collagen and other proteins in the teeth can be regenerated,

Further, they plan to characterize the protein fragments released when collagen is treated with hydrogen peroxide and determine if hydrogen peroxide has the same impact on other proteins in the teeth.



## Regular Use of Mouthwash May Increase Risk for Diabetes

### - Robert Glatter, MD Contributor

(<https://www.forbes.com/sites/robertglatter/2017/11/26/regular-use-of-mouthwash-may-increase-risk-for-diabetes/#65d456ef6c1c>) **Curated by Raju Mane (Final year), Guided by Ashish Kulkarni**

The study, published in the journal, found that persons who use mouthwash at least two times a day had a 55% higher risk of developing prediabetes or diabetes over a three-year follow-up period compared with those who used it less frequently. 30 percent of the persons who used mouthwash at least twice a day developed either prediabetes or diabetes.

The contents of the mouthwash kill both good and bad types of oral bacteria that contribute to development of plaque and bad breath. But some of the beneficial bacteria that colonize our oral cavities also produce a chemical--nitric oxide--that helps to prevent diabetes. Nitric oxide plays an important role in regulation of insulin levels in the body, which in turn has a large effect on our energy level and metabolic rates.

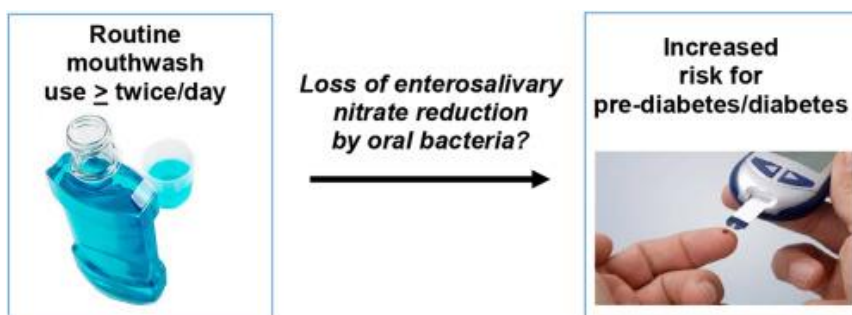
Destruction of "good" bacteria by frequent use of mouthwash changes the oral flora, alters metabolism of blood sugar in our bodies, leading to prediabetes or diabetes.

The researchers found that 43% of the study participants used mouthwash at least once a day, and 22% used it at least twice a day.

While both subgroups were at higher risk for developing prediabetes or diabetes, there was no association seen when used less than twice a day. Researchers suspect a threshold effect, with greater than twice daily use increasing the risk for developing diabetes.

While the study noted an association between frequent use of mouthwash and development of diabetes, this is not a cause and effect relationship.

Additional research will be necessary to see if these findings can be replicated in a larger population.





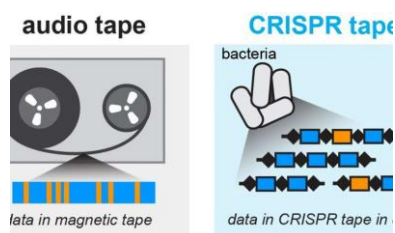
# The world's smallest data recorder created from bacteria

(<https://www.indiatoday.in/education-today/gk-current-affairs/story/worlds-smallest-data-recorder-1095251-2017-11-27>) **Curated by Pragya Gigoo (Final Year) Guided by Sudhir Pandya**

A characteristic bacterial insusceptible framework has been changed over by researcher into the world's tiniest information recorder. This exploration lays the basis for another innovation class that utilises bacterial cells for everything from illness analysis to ecological checking. A conventional research centre strain of the universal human gut organism *Escherichia coli* was modified, empowering the microbes to record their connections with the surroundings as well as time-stamp the occasions. "Such microbes, gulped by a patient, may probably record the progressions they experience through the whole digestive tract, yielding an uncommon perspective on already difficult to reach wonders," said Harris Wang from the CUMC, as indicated by PTI.

Its appropriateness in ecological detecting, essential examinations in biology and microbiology and different territories where microscopic organisms could screen generally undetectable changes without disrupting their environment, as per the investigation is being contemplated. Wang and his group at the Columbia University Medical Center (CUMC) in the US made the minuscule information recorder by exploiting an invulnerable framework in numerous types of microbes. This resistant framework duplicates pieces of DNA from attacking infections so resulting ages of microscopic organisms can repulse these pathogens all the more viably. To construct their tiny recorder, the scientists changed a part of DNA called a plasmid, enabling it to make more duplicates of itself in the bacterial cell in response of any stimulus or signal.

At the point when an outer sign is recognized by the cell, the plasmid is additionally actuated, prompting inclusion of its sequences. The outcome is a blend of foundation successions that record time and sign groupings that change contingent upon the cell's condition. The scientists would then be able to look at the bacterial locus and utilize computational devices to peruse the chronicle and its planning. The examination was distributed in the diary *Science*.





## Drug-resistant tuberculosis reversed in lab

(<https://www.sciencedaily.com/releases/2019/06/190604094254.htm>)

**Curated by Pragma Gigoo Guided by Sudhir Pandya**

Researchers have found a compound when given with isoniazid potentially could restore the antibiotic's effectiveness in people with drug-resistant tuberculosis. The longer people have to be on antibiotics, the more issues with patient compliance you get, and that can lead to drug resistance and treatment failure. Here, researchers found a compound that sensitizes bacteria to an antibiotic, prevents drug resistance from arising, and even reverses drug resistance -- at least in the lab.

"Tuberculosis is caused by the bacterium *Mycobacterium tuberculosis*." Once inside the body, the bacteria morph into a tougher form that can withstand more stress and is harder to kill. Rather than look for new and better antibiotics, Stallings and co-first authors Kelly Flentie, PhD, a former postdoctoral researcher at Washington University, and Gregory Harrison, a graduate student, decided to look for compounds that prevent the bacteria from toughening up. When put in a low-oxygen environment to mimic the stressful conditions TB bacteria encounter inside the body, the bacteria come together and form a thin film called a biofilm which is resilient to not only low-oxygen conditions but also to antibiotics and other stressors.

The researchers needed only a fraction of the amount of isoniazid to kill the TB bacteria when C10 was included than with isoniazid alone. In addition, one out of 1 million TB bacteria spontaneously become resistant to isoniazid when grown under typical laboratory conditions when the researchers grew TB bacteria with isoniazid and the compound, the drug-resistant mutant bacteria never arose. Most surprisingly, the compound even reversed drug resistance.

TB bacteria with mutations in the gene can withstand isoniazid treatment. But such bacteria die when treated with isoniazid plus the compound, the researchers discovered. "This was a totally unexpected finding," Stallings said. This study was conducted on bacteria growing in a lab.

The researchers are still figuring out whether the compound is safe and how it might be processed by the body.