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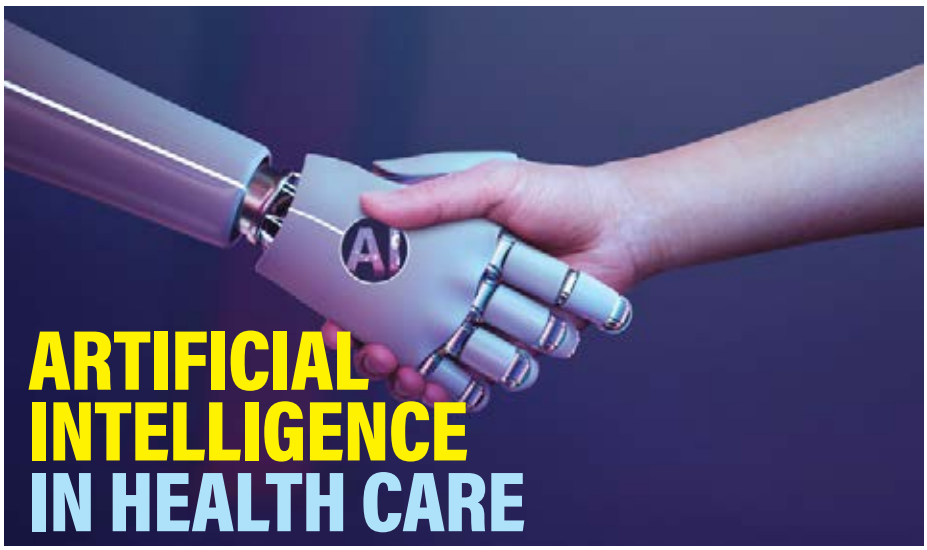

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Does AI pave the way for medical transformation?????

Dear Readers,

Double Helical has been making a difference in the lives of the socially and economically disadvantaged groups through raising awareness as well making voluntary contributions in the areas of education, health, human rights and social services.

We find it immensely satisfying every month to present to you a wide range of interesting, in-depth and analytical stories pertaining to the latest trends and advancements in the world of healthcare. We hope you would derive the same value and substance after reading the current issue of Double Helical.

In this current issue we highlight the growing trends of "Artificial Intelligence" which is being considered as the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing, speech recognition and machine vision.

In recent past we brought AI into the mainstream through widespread familiarity with applications of Generative Pre-Training Transformer. The most popular application is Open AI's ChatGPT. The widespread fascination with ChatGPT made it synonymous with AI in the minds of most consumers. However, it represents only a small portion of the ways that AI technology is being used today.

The ideal characteristic of artificial intelligence is its ability to rationalize and take actions that have the best chance of achieving a specific goal. A subset of artificial intelligence is machine learning (ML), which refers to the concept that computer programs can automatically learn from and adapt to new data without being assisted by humans. Deep learning techniques enable this automatic learning through the absorption of huge amounts of unstructured data such as text, images, or video.

As experts believe that any technological advance has its teething troubles. Modern technology may be presently facing this. AI and Machine Learning while they seem threatening to most actually bring us hope. Provided they are used appropriately and optimally. While they may seem disruptive in the short run, in the long run they can make medical care more humane. Future developments in Undoubtedly, AI and Machine Learning may bring back the past when the physician's empathy, communication skills and personal attention to the patient contributed to the healing process.

Doctors using AI and Machine Learning tools will be spared from the mundane tasks which take up most of their time presently. For example, AI enabled voice and image recordings will make Electronic Health Records extinct. This will offer physicians the gift of time which if properly used can revive the presently fragile doctor-patient relationship. They will have time to communicate better with their patients.

Apart from this we also highlight outstanding of contribution of world fame Dr S K Sarin who has credited globally to give a huge number relevant and new protocol for the management of patients with hepatitis and cirrhosis of the liver. His recent contributions in the field of liver regeneration using growth factors has a great potential for patients with advanced liver disease and liver failure so as to provide options of transplant free survival. His outstanding contribution to develop 17 major treatment guidelines, including spearheading five major Asian Pacific Treatment Guidelines in Liver diseases; are being widely quoted and practiced.

The problem of liver disease was always there. Even in 2000 BC there were no worship of god and goddess in the temples. The liver was only kept. There was great importance of liver in Babylonians times. Because people knew that liver is the centre of the body. Heart was only discovered 400 to 500 years ago. Liver is sheet of your body as pillar. This is also largest and very tolerant organ of the body. So if you are not careful about your liver than it becomes worse. Lot of times what you eat and what you drink, liver can tolerate but after a while it revolts.

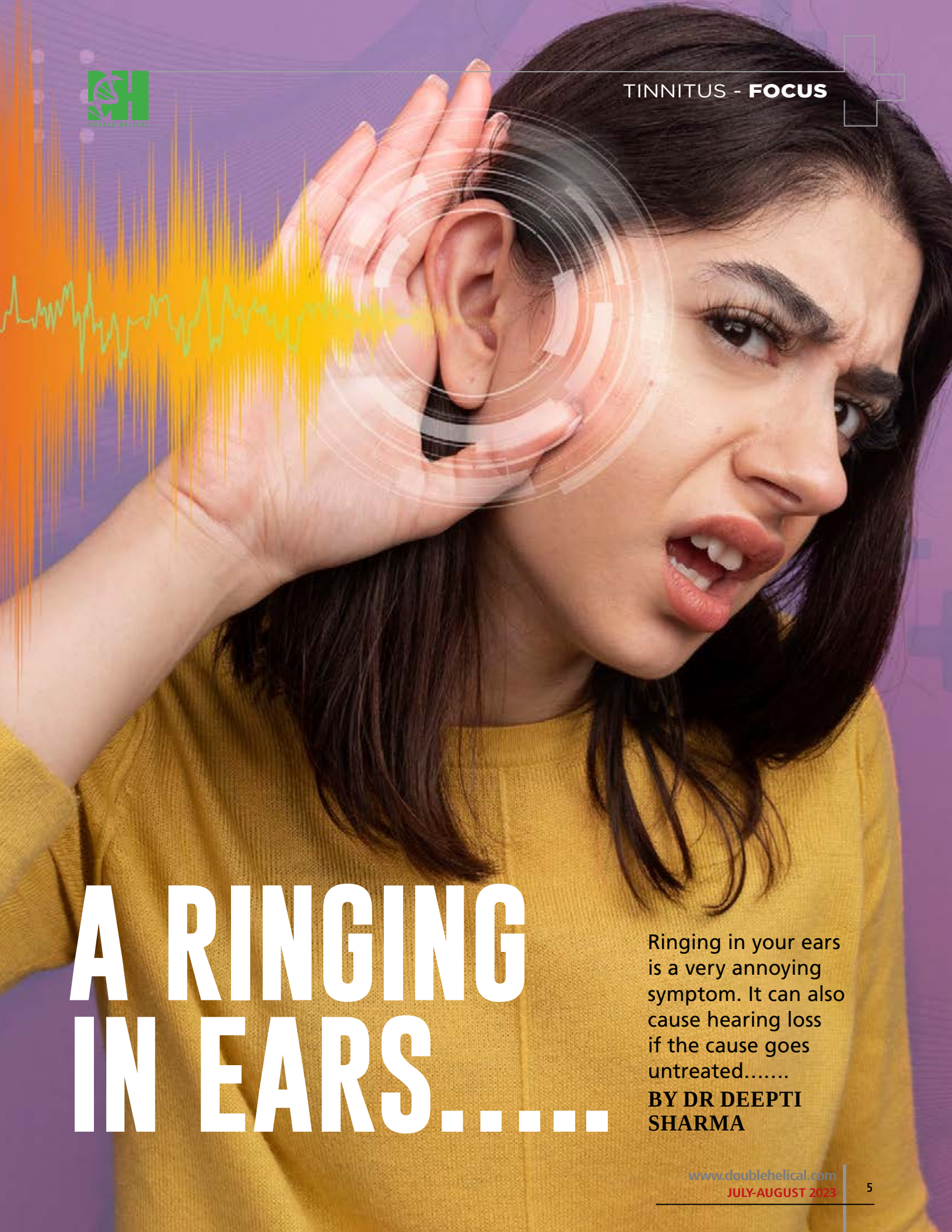
Today intake of alcohol has become most socially accepted poison. Alcohol is very important cause of liver disease. Alcohol consumption has increased across all social, age and gender groups. Awareness about alcohol consumption is of paramount importance in preventing liver disease. Lack of self help groups and social stigma in approaching them prevents people in need of help from coming out in open. We need a massive public awareness campaign to educate people about safe and responsible alcohol consumption.

Fatty liver is a condition usually picked up incidentally on routine ultrasound and investigation for deranged liver function tests. It is a slowly progressive disease but in a significant number of subjects can lead to liver cirrhosis over years to decades. The most common causes for fatty liver are obesity and diabetes.

There are many more stories based on deep analysis and expert viewpoints. We hope you will enjoy reading such topical stories and encouraging us with your feedback to enable us to further improve your favourite magazine.

Thanks and regards

Amresh K Tiwary,
Editor-in-Chief



A RINGING IN EARS.....

Ringing in your ears is a very annoying symptom. It can also cause hearing loss if the cause goes untreated.....

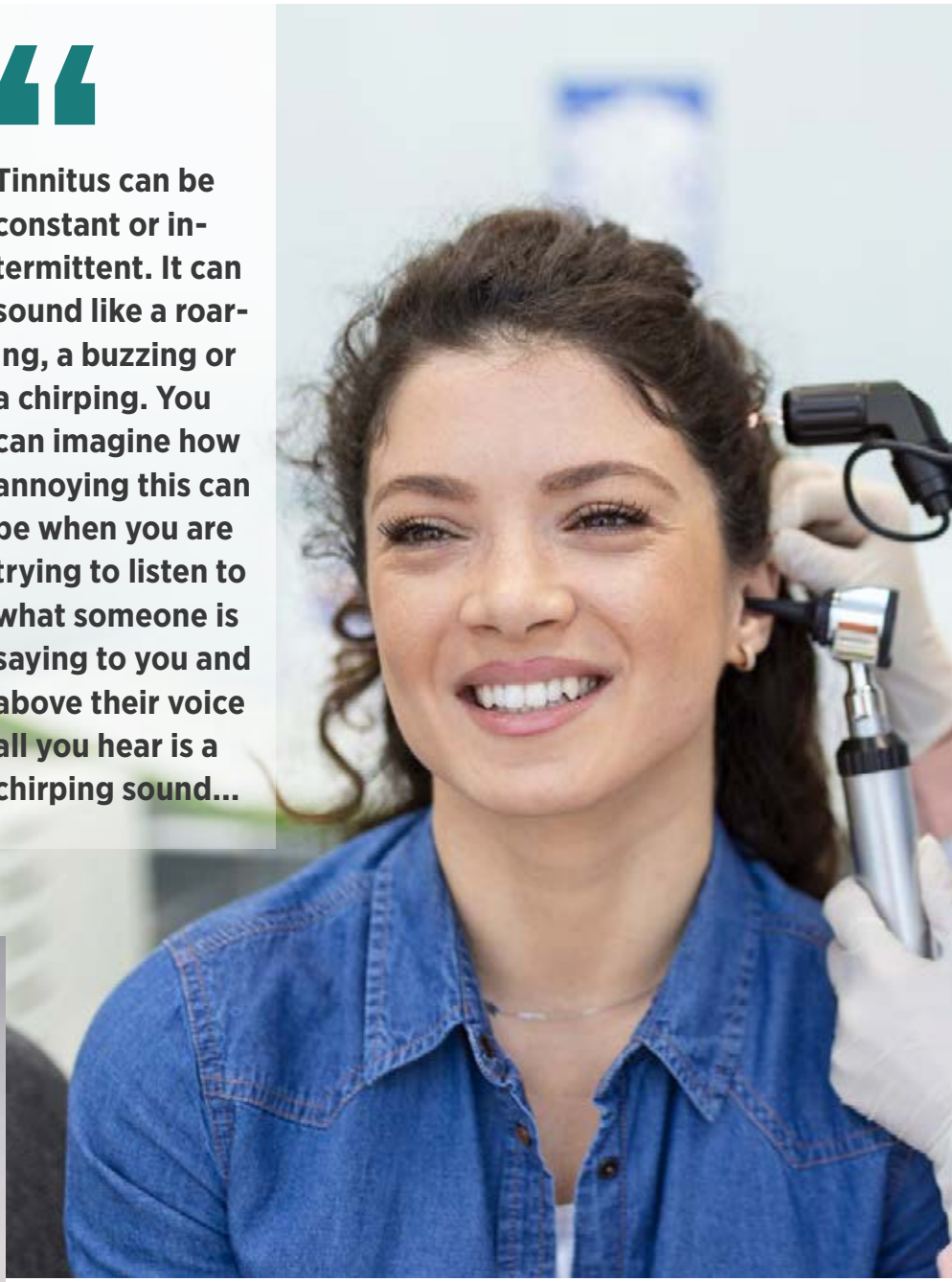
BY DR DEEPTI SHARMA

People who suffer Tinnitus {ringing in the ears) they generally seek help from ENT specialists, but the problem sometimes originates from compressed jaw joints. Tinnitus can sound like a high-pitched whistle or it can sound like a hissing sound.

Tinnitus can be constant or intermittent. It can sound like a roaring, a buzzing or a chirping. You can imagine how annoying this can be when you are trying to listen to what someone is saying to you and above their voice all you hear is a chirping sound. A lot of people actually wear away or eat away several layers of the tooth especially in the biting surface of the tooth which is called as bruxism which in later cause severe dental attrition issue.

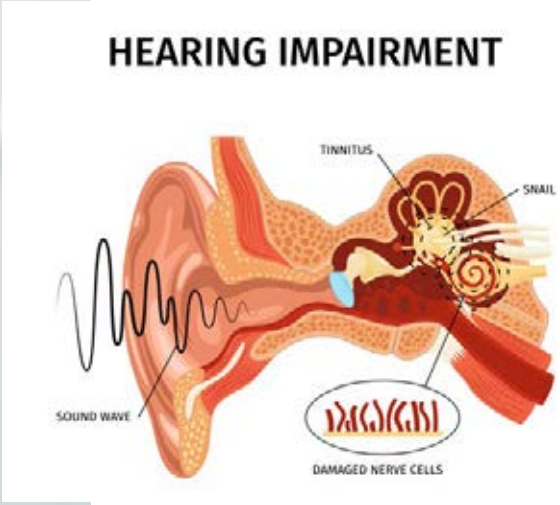
In such people most of their teeth have become flat because they have worn away and there is a loss in vertical height. So we have to treat this as a complete rehabilitation process. In addition to get rid of the habit or working towards reducing the effect of the habit on the teeth, we also have to restore the teeth back and give them crowns under full mouth rehabilitation for attrited teeth.

Tinnitus can be constant or intermittent. It can sound like a roaring, a buzzing or a chirping. You can imagine how annoying this can be when you are trying to listen to what someone is saying to you and above their voice all you hear is a chirping sound...



RINGING IN THE EARS MAY BE DENTAL ISSUE

Can my teeth really cause ringing in my ears? Well surprisingly jaw joint and bite problems have been scientifically shown to be one of the causes of tinnitus. Tinnitus is a constant ringing or humming noise and sufferers often experience more insomnia, anxiety and depression. Tinnitus



affects all age groups, and it's thought that about 10 percent of the population have it all the time. The usual symptoms of jaw joint problems are tooth grinding, pain, earache, clicking of the joint, or difficulty in opening the mouth. Other symptoms that may arise are headaches, neck pain and teeth cracking.

The temporomandibular jaw joint is a complex joint as it has to allow for side-to-side and front to back movements that take place during chewing. The muscles that make the jaw move are some of the most powerful in the body. This means that quite large forces have to act through the jaw joint and as a result, the joint is at risk of damage.

There are three main theories behind why problems with the jaw joint may cause tinnitus, or make it worse. Firstly, the chewing muscles are near to some of the muscles that insert into the middle ear and so may have an effect on hearing, and so may promote tinnitus. Secondly, there can be a direct connection between the ligaments that attach to the jaw and one of the hearing bones that sits in the middle ear. Thirdly, the nerve supply from the jaw joint has been shown to have connections with the parts of the brain that are involved with both hearing and the interpretation of sound.

The jaw joint can be overloaded if your teeth are the wrong shape or out of position, even slightly. Jaw joint problems are common in people with missing teeth and when the teeth don't fit together properly. If you suffer from tinnitus it can be an idea to make sure that your jaw joint is working properly. We as dentist can make you a removable individual bite tester to wear and if this takes the tinnitus away, treatment can be carried out to improve your bite and keep the noise away permanently. Treatments may include reshaping or replacing teeth, braces or a bite guard.

(The author is Owner/Director, Dr Sharmas Dental care, Nagpur)

RECONSIDER THE NEXT TO SAVE EDUCATION AND HEALTH

Keeping changing the exam pattern of medical education in mind Indian Medical Association (IMA) demands that it has to be either totally done away with or modified to ensure justice to medical fraternity and good health to all citizens.....

BY DR VINAY AGGARWAL

Medical students all over the country are anxious, making studying almost impossible. Next, the proposed new exam is creating much confusion and agony. Medical education in the country is under the direct control of NMC (National Medical Commission). Each seat in UG and PG course needs their sanction. The curriculum is decided and implemented by NMC, courses conducted by approved colleges and exams held by the universities.

A student gains admission through the entrance, conducted by the government. He undergoes one of the toughest training, appears in umpteen theories, practical, viva and clinical exams and qualifies all exams conducted by respective the universities. Hitherto passing the final MBBS exam conducted by the university would allow the student to graduate and completion of internship would get him his right to practice medicine. This system has prevailed for decades and has produced some of the best doctors in the world.

Now NMC feels, for unknown reasons without any gap analysis whatsoever, that the system has to change. Medicos, they say, should appear in a final exam, NEXT if they're to be allowed to practice. The idea is to test the standards and also to provide a common test for license and post graduate entrance. This will be a mcq type centralized theory exam conducted by AIIMS followed by a practical exam by the University. Students have to pass both to be eligible to become an intern and then have to pass one more viva at the end of internship to be eligible to get license to practice medicine.

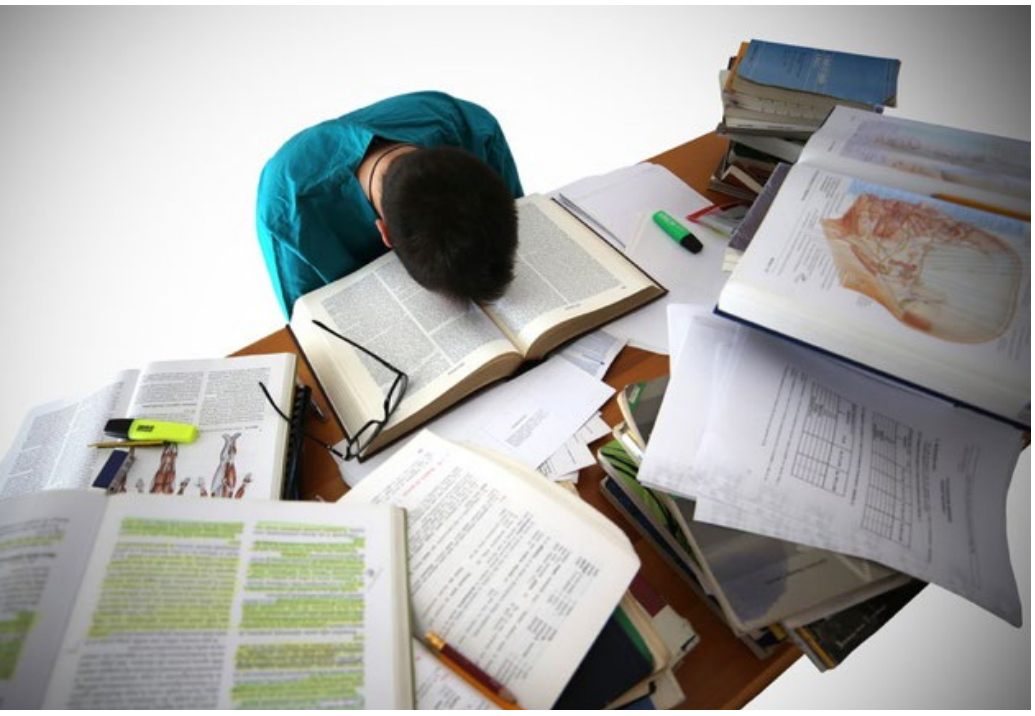
FEW LEGITIMATE QUESTIONS ARISE HERE

1. Whose standards are we trying to test? Whether it's of the authorities who sanction these courses, NMC who set the curriculum, universities which conduct the exams or colleges who conduct the courses? How can testing students ensure standards of any of these institutions? Shouldn't we be having mechanism to test these systems and not the students who have undergone a five year course according to set standards?

2. Changing the exam pattern to MCQ (multiple Choice Questions) has serious repercussions. Review of the results of MCQ based PG entrance exam of previous years show that only around 25 percent have scored 50 percent marks. The NEXT exam being common for license and PG entrance can be expected to be of similar standards. What should the 75% leftovers do? After five years of rigorous course they'll continue to be just plus two qualified.

3. Currently the best out of those who appear get PG seats, the cut off qualifying marks being around 30 percent. With only 25 percent expected to qualify the next exam how the PG seats will be filled. How will we get interns and junior doctors? Won't this lead to collapse of not just medical education but health care too?

4. MBBS testing pattern has never been MCQ based. Now there are only 10% multiple choice questions, rest



90 percent are subjective, which is only legitimate given the nature of medical studies. Having MCQ mode of exam for PG entrance is well understood. But using the same format for medical licensing that too with negative marks can never be justified. MBBS students are trained all along in the subjective method and neither students nor teachers are aware or trained in MCQ method and suddenly changing the exam pattern will only help in mushrooming of entrance coaching centers and divert the students main purpose from learning and acquiring clinical skills to mugging entrance questions.

5. While entrance is a competitive exam to test the best, licensing exam should be a qualifying exam to test the minimum essential skills and how can both be tested with the same exam? If at all anyone insists on MCQ tests as licensing exam, shouldn't it be different from the competitive PG entrance test?

6. As such we all know that medical students are equipped to practise Medicine not through the tests they undergo but through the course, curriculum and training. Exam topper may not be the best Doctor. What we've to ensure are the best standards of Medical education and right connect with society.

7. On one hand the government wants to liberalize medical education and are opening up more medical colleges to overcome deficiency of medical manpower. On the other hand trained graduates are being prevented from practicing Medicine. Isn't this paradoxical? Won't this result in wasting of the huge investment in Medical education?

Next is neither feasible nor desirable. It'll only distract Medicos from focusing on their studies, deny them of their legitimate right to practice the medicine and deprive the society of the services of qualified doctors.

That's why we are demanding that it has to be either totally done away with or modified to ensure justice to medical fraternity and good health to all citizens.

(The author is Past National President IMA and Chairman Action Committee IMA)

The Diet Doctor

If you are serious about becoming your strongest and fittest self, eating nutritionally dense foods is essential to your workout plan....

BY ISHI KHOSLA

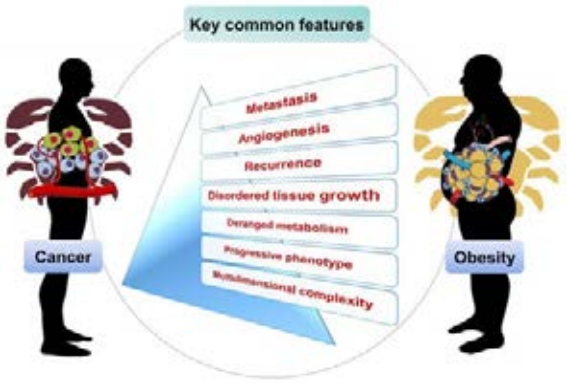
Fitness should not be seen as a 'monthly paid subscription' routine that a person can revoke anytime. It is a lifelong commitment between your body and good health metrics that marks both your body and mind safe from heart disease risks, strokes, diabetes, hypertension, and metabolic syndrome.

"The Diet Doctor" book clearly mentions about how obesity and corpulence are a curse for your body which can be easily warded off if a person takes pertinent actions. To corroborate that, the book throws light on when WHO announced that obesity is listed among the top ten risk conditions in the world. The repercussions of obesity are inexorable like fatty liver, chronic depression, irritable bowel syndrome, and erectile dysfunction, which are common causes of sleepless nights for people, in general.

The book suggests that "Keeping Your Body at its optimum weight is a health must and non-negotiable". Weight loss should be a priority but not in a superficial sense just to look

good. In fact, it should be looked at as a healthy and nutritional way of life to overgrow endless health hazards and problems attached to obesity. To get an idea of how much weight one should lose or 'discover your optimum weight', you should get an accurate measure of your Body Mass Index (BMI), total body fat percentage and distribution, waist circumference, waist-to-height ratio, and body shape. The book also educates about the key differences between simple and metabolic obesity. Gaining weight in a 'generalized fashion' has been described as simple obesity. One very 'predictably and gradually' gains weight. There is usually no record of positive family history of diabetes among these individuals. Therefore, insulin resistance is not marked in these cases. The opposite is the case in metabolic obesity which facilitates an insulin-resistant state and people usually develop conditions like PCOS under this.

The book also goes on to explore how the Indian diet aggravates obesity. Traditional Indian diets are High-carbohydrate and High-glycemic diets like rice, pulses, potatoes, and wheat. Sugar and sweetened product consumption, snacking, late dinners, and staying still are enumerated as one of the major causes of obesity. With globalization and the acculturation process stemming, Western influences have grown thicker in Indian soil. Increasing consumption of alcohol and junk or



processed foods have become reasons for acute corpulence. Overeating due to children swatting before exams and holidaying or frequent traveling also adds numbers to the 'globesity' statistics, a term coined by WHO.

The book attributes that the only way you can shed the extra kilos and overhaul a long-term fitness goal is 'if you mind what you eat, constantly and consistently.' For that, 'Knowledge of calories and nutrients is a great way to manage your everyday diet', Ishi Khosla suggests. Diet temperance is the most important thing here. You should know the amount of calories you are taking in your body versus the amount of food required for regular healthy functioning. The excess calorie intake of especially fried and junk food

exacerbates weight issues. One should not get obsessed with calorie intake and Google before every food bite they take. But people should definitely develop a good idea about calorie intake. For Example- Whole grains, being high in fiber and low in fat, are a good choice for weight watchers.

Ishi Khosla is a practicing clinical nutritionist, columnist, author, an entrepreneur, researcher and welfare worker. She is actively involved in clinical practice at the Centre For Dietary Counseling in Delhi where she deals with a wide range of nutrition related health problems including obesity, diabetes, cardio-vascular disease, food allergies, digestive, immune system, neuro psychiatric and endocrine disorders in adults and children. To scale up her practice and reach out to a global audience

Diet plans are a dreaded term for food lovers. In the book, well-known nutritionist Ishi Khosla describes the components of a healthy diet plan and what it should include and encompass. It is a must-read encyclopedia for people who are struggling to create their diet plans and follow them religiously. It is beautifully explained through an elaborative table that will fulfill every nutrient requirement for your body while also keeping your weight in check.

The book also identifies certain problem areas such as increased temptation, eating larger portions, and higher intake of refined starches like maida and poor-quality fat, sugar, and salt for widespread corpulence. This is indeed an indubitable fact as fast food frenzy and lack of self-control and abstinence from fast food has become vexing issue in the younger generations.

Planning your day in advance and regulating portions and following the half-plate rule are some of the ways in which a person can decrease weight. The book also enlists uncompromising 15 principles that one should follow to solve obesity problems. Among them, Regular Exercise, Mindful eating, Stress management, Avoidance of late-night meals and meal skips, and regular health checkups are very important.

Ishi Khosla also cannily tells us, readers, about inventive and delicious healthy recipes for starters and main course dishes such as Slimmer's Fibre Delight, Quinoa Vegetable Porridge, Savoury Vegetable n Lintels Bites, Brown Rice Poha, Moong Dal Poha which are easy to make yet so nutritious and salubrious.

The book basically is a nutritional exposition that every person who is making dietary errors, or struggling to lose weight should peruse to make comprehensive changes in their lifestyle and tread smoothly rather than trudge on a lifelong journey of fitness.

(The author is Practicing Clinical Nutritionist, Author Of The Diet Doctor)

PROBLEM OF PLUS-SIZE

Obesity Hypoventilation Syndrome (OHS), a risk factor for obstructive sleep apnea, is associated with significant morbidity and mortality. Treatment options include weight reduction, positive airway pressure therapy and surgical interventions including bariatric surgery …

BY DR PRANAV ISH

OHS is defined as a combination of obesity (body mass index [BMI] > 30 kg/m2) with daytime hypercapnia (pCO2 > 45 mm Hg) in the absence of other known causes of alveolar hypoventilation.1 Such patients generally also have underlying sleep apnea.

PREVALANCE & BURDEN

Obesity is a risk factor for obstructive sleep apnea/hypopnea syndrome (OSAHS). Some studies have found

TYPES OF BARIATRIC SURGERY

Bariatric surgery includes a variety of procedures performed on people who have obesity. Weight loss is achieved by reducing the size of the stomach with a gastric band or through removal of a portion of the stomach or by resecting and re-routing the small intestine to a small stomach pouch.

The type of surgery that may be best to help a person lose weight depends on a number of factors. In open bariatric surgery, surgeons make a single, large cut in the abdomen. More often, surgeons now use laparoscopic surgery, in which they make several small cuts and insert thin surgical tools through the cuts. Surgeons also insert a small scope attached to a camera that projects images onto a video monitor. Laparoscopic surgery has fewer risks than open surgery and may cause less pain and scarring than open surgery. Laparoscopic surgery also may lead to a faster recovery.

Open surgery may be a better option for certain people. If you have a high level of obesity, have had stomach surgery before, or have other complex medical problems, you may need open surgery.

There are the surgical options like laparoscopic adjustable gastric band, gastric sleeve surgery, also called sleeve gastrectomy and gastric bypass. Surgeons also use a fourth operation, biliopancreatic diversion with duodenal switch, less often.

LAPAROSCOPIC ADJUSTABLE GASTRIC BAND

In this type of surgery, the surgeon places a ring with an inner inflatable band around the top of your stomach to create a small pouch. This makes you feel full after eating a small amount of food. The band has a circular balloon inside that is filled with salt solution. The surgeon can adjust the size of the opening from the pouch to the rest of your stomach by injecting or removing the solution through a small device called a port placed under your skin.

After surgery, you will need several follow-up visits to adjust the size of the band opening. If the band causes problems or is not helping you lose enough weight, the surgeon may remove it.The U.S. Food and Drug Administration (FDA) has approved use of the gastric band for people with a BMI of 30 or more who also have at least one health problem linked to obesity, such as heart disease or diabetes.

GASTRIC SLEEVE

In gastric sleeve surgery, also called vertical sleeve gastrectomy, a surgeon removes most of your stomach, leaving only a banana-shaped section that is closed with staples. Like gastric band surgery, this surgery reduces the amount of food that can fit in your stomach, making you feel full sooner. Taking out part of your stomach may also affect gut hormones or other factors such as gut bacteria that may affect appetite and metabolism. This type of surgery cannot be reversed because some of the stomach is permanently removed.

GASTRIC BYPASS

Gastric bypass surgery, also called Roux-en-Y gastric bypass, has two parts. First, the surgeon staples your stomach, creating a small pouch in the upper section. The staples make your stomach much smaller, so you eat less and feel full sooner.

Next, the surgeon cuts your small intestine and attaches the lower part of it directly to the small stomach pouch. Food then bypasses most of the stomach and the upper part of your small intestine so your body absorbs fewer calories. The surgeon connects the bypassed section farther down to the lower part of the small intestine. This bypassed section is still attached to the main part of your stomach, so digestive juices can move from your stomach and the first part of your small intestine into the lower part of your small intestine. The bypass also changes gut hormones, gut bacteria, and other factors that may affect appetite and metabolism. Gastric bypass is difficult to reverse, although a surgeon may do it if medically necessary.

DUODENAL SWITCH

This surgery, also called biliopancreatic diversion with duodenal switch, is more complex than the others. The duodenal switch involves two separate surgeries. The first is similar to gastric sleeve surgery. The second surgery redirects food to bypass most of your small intestine. The surgeon also reattaches the bypassed section to the last part of the small intestine, allowing digestive juices to mix with food.
This type of surgery allows you to lose more weight than the other three. However, this surgery is also the most likely to cause surgery-related problems and a shortage of vitamins, minerals, and protein in your body. For these reasons, surgeons do not perform this surgery quite often.

Most Common Weight-loss Surgeries is Gastric Band. In this the surgeon places an inflatable band around top part of stomach, creating a small pouch with an adjustable opening.

PROS

•Can be adjusted and reversed.
•Short hospital stay and low risk of surgery-related problems.
•No changes to intestines.
•Lowest chance of vitamin shortage.

CONS

•Less weight loss than other types of bariatric surgery.
•Frequent follow-up visits to adjust band; some people may not adapt to band.
•Possible future surgery to remove or replace a part or all of the band system.

GASTRIC SLEEVE

There are two components to the procedure. First, a small stomach pouch, approximately one ounce or 30 milliliters in volume, is created by dividing the top of the stomach from the rest of the stomach. Next, the first portion of the small intestine is divided, and the bottom end of the divided small intestine is brought up and connected to the newly created small stomach pouch. The procedure is completed by connecting the top portion of the divided small intestine to the small intestine further down so that the stomach acids and digestive enzymes from the bypassed stomach and first portion of small intestine will eventually mix with the food.

The gastric bypass works by several mechanisms. First, similar to most bariatric procedures, the newly created stomach pouch is considerably smaller and facilitates significantly smaller meals, which translates into less calories consumed. Additionally, because there is less digestion of food by the smaller stomach pouch, and there is a segment of small intestine that would normally absorb calories as well as nutrients that no longer has food going through it, there is probably of some degree less absorption of calories and nutrients. Most importantly, the rerouting of the food stream produces changes in gut hormones that promote satiety, suppress hunger, and reverse one of the primary mechanisms by which obesity induces type 2 diabetes.

hypercapnia in 10% to 20% of OSAHS patients; however, these studies were limited by small sample size, biased recruitment of patients with COPD or severe obesity, and the exclusive enrollment of one gender group and/or ethnic background. Hence, the exact prevalence of OHS is not known. Also, little is known about prevalence of OHS in the obese population, irrespective of OSAHS. Current estimates suggest that around 0.3% to 0.4% of the population may have OHS.Prevalence of OHS is set to increase with rising obesity; therefore, accurate assessment of prevalence of OHS is critical for planning health services to make provision for this condition.

Furthermore, the need for early detection of OHS is clear because delay in diagnosis and treatment is associated with significant morbidity and mortality. If left untreated, OHS is associated with a mortality of 23% at 18 months following discharge from hospital; adequate treatment of OHS reduces this to 3%. In addition, untreated OHS patients are likely to require invasive mechanical ventilation with longer hospital stay.

The standard assessment to screen for daytime hypercapnia is measurement of arterial blood gases. It has been suggested that obese patients with hypercapnia have higher BMI, more severe OSAHS, and worse restrictive chest wall mechanics, and a higher chronic bicarbonate levels than normocapnic obese patients.

PATHOLOGY & TREATMENT

The pathophysiology of OHS is complex, more like a vicious cycle. But effective treatment options are available which block this complex pathophysiological pathway at different levels.

The root cause is obesity, so treatment for that is most effective, directly inhibiting all further pathways. Pure obesity with OSA leading to OHS without leptin resistance is a pathway, which if diagnosed and treated early, can help in effective cure.

Weight reductions by diet control, exercise and surgical options like bariatric surgery have shown to be highly beneficial. Positive airway pressure (PAP) therapy has been the cornerstone of treatment. Continuous PAP therapy works in most patients; few may require bi-level PAP therapy. Drugs like medroxy progesterone and acetazolamide as respiratory stimulants have unproven role.

Thus, the modern era of obesity unfolds new burdens of undermined diseases for which early diagnosis, treatment and more so, prevention is the key to prevent further morbidity and mortality.

(The author is Associate Professor, Department of Pulmonary, Critical care & Sleep Medicine, Vadhaman Mahavir Medical College & Safdarjung Hospital, New Delhi)

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ARTIFICIAL INTELLIGENCE IN HEALTH CARE

Being established as revolutionary technique of medical diagnosis Artificial Intelligence has an ultimate goal to create expert systems which exhibit intelligent behaviour, learn, demonstrate, explain, and advice its users.....

BY DR NK PRASANNA/ DR SK VARSHNEY

DR N.K. PRASANNA

DR S. K. VARSHNEY

In today's digital world, smart phones have become an integral part of our daily routine. From waking up in the morning till late evening, we continue to check notifications. Our mobile devices have become a gateway to the world. Health Care in the world, including India, has also seen many developments together with the advancement of information technology, artificial intelligence, and telecommunications.

The World Health Organization (WHO) defines Telemedicine as "The delivery of healthcare services, where distance is a critical factor, by all healthcare professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment, and prevention of disease and injuries, research and evaluation and the continuing education of healthcare providers, all in the interests of advancing the health of individuals and their communities.1-2 Telemedicine has taken the most crucial role in Public Health in many countries3.

The next level of advanced development in combination of information technology and telecommunication for enormous data transfer came out as Artificial Inelegance (AI). The value of AI is immeasurable. Its addition to any field instantly doubles its potential and capabilities.

WHAT IS AI?

Artificial Intelligence, often called AI, is a revolutionary field that has transformed how the machines process information, and performs tasks. At its core, AI encompasses the intelligence exhibited by these machines which not only aids in executing numerous functions but also boasts features like sentiment analysis and natural language processing (NLP). Utilizing sentiment analysis and NLP, machines can evaluate emotions and thoughts conveyed through text or speech, allowing them to understand better

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human communication. Further, one of the most remarkable aspects of AI lies in its ability to autonomously analyze vast amounts of historical data and preloaded given information.

This acquired knowledge enables machines to comprehend patterns, make sense of complex datasets, and utilize this information effectively for various business-oriented tasks. It is important to note that while AI represents a larger umbrella term encompassing different technological advancements such as machine learning and deep learning; each subset carries distinct responsibilities when equipping machines with invaluable cognitive abilities.

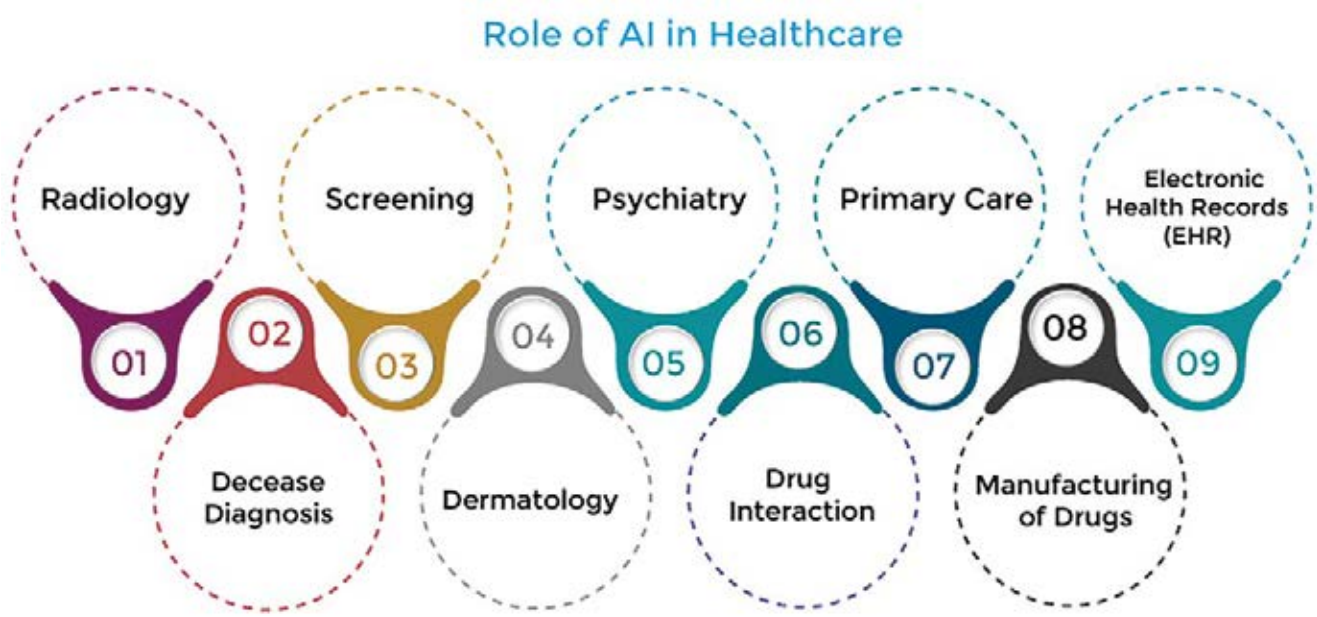
The health industry and wellness industry has already been utilizing information technology in the storage of diagnostic results, case sheets, and prognosis of different diseases and disorders and telemedicine utilizing critical invasive procedures across the world, now advancement came in the shape of Artificial inelegance in health care.

TYPES OF AI IN HEALTH CARE:

AI is an umbrella term covering a variety of distinct, but interrelated processes. Some of the most common forms of AI used within health care include Machine learning (ML). In this process, algorithms are trained using data sets like health records to create models capable of performing tasks such as categorizing information or predicting clinical outcomes. ML has revolutionized healthcare by enabling precision medicine and diagnosis through pattern recognition and predictive analytics.

Another essential form is deep learning, which takes machine learning one step further. It involves greater volumes of data, longer training times, and layers of ML algorithms to produce neural networks capable of more complex tasks. Deep learning has shown promise in medical imaging analysis for early detection and accurate classification of diseases. Neural language processing (NLP) utilizes machine learning techniques to interpret human language, both verbal and written. In the context of healthcare, NLP is widely used to extract meaningful information from patient documentation, notes, reports, and published research papers. This helps clinicians make more informed decisions based on vast amounts of unstructured textual information and case sheet data stored worldwide.

Robotic process automation (RPA)



merges AI with computer programs to automate administrative and clinical workflows within healthcare organizations. RPA simplifies tasks like appointment scheduling, billing procedures, and record keeping, reducing errors while enhancing efficiency in daily operations.

Alexa, makes our lives easier, and enhances our overall productivity.

In today's fast-paced world, we have become accustomed to relying on virtual assistants like Siri, Alexa, or Google Assistant for various tasks. These AI-powered apps have become an integral part of our daily routines for many, serving as personal secretaries that cater to our needs and provide us with instant information.

One of the remarkable aspects of these AI assistants is their ability to utilize artificial intelligence to personalize our experiences. For instance, when we turn on the GPS for navigation purposes, it is through AI technology that we are alerted about potential traffic jams ahead. This personalized information allows us to make informed decisions and avoid unnecessary delays.

Moreover, AI has revolutionized the way we interact with technology by tailoring it specifically for us. It understands our preferences and adapts accordingly. Just like a specially cooked curry that satisfies half of our hunger simply because it was made with love and consideration for our tastes, personalized AI ensures that all aspects of our work are tailored to suit us.

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The value of personalization cannot be underestimated in today's world where time is precious and efficiency is key. Artificial intelligence saves us time by automating tasks and streamlining processes. It anticipates our needs and provides proactive suggestions or recommendations based on past behaviors or patterns. In essence, artificial intelligence has become an indispensable tool in modern society. It not only saves us time but also enhances our productivity by providing personalized assistance in various areas of life. As we continue to embrace this technology-driven era, it is clear that AI will play an increasingly significant role in shaping the way we live and work.

MEDICAL

In the field of medicine, the integration of artificial intelligence (AI) has proven to be incredibly beneficial. From digitizing health records to conducting research, AI is revolutionizing the way the healthcare professionals operate. One significant advantage of AI in medicine is its ability to analyze vast amounts of information, enabling quicker and more accurate diagnoses. A prime example of this can be seen in the early detection of heart failure. Previously, identifying the warning signs leading to sudden death was a challenging task.

However, thanks to advancements in AI technology, a research team from IBM has successfully analyzed patient electronic health records using artificial intelligence algorithms. Their findings have concluded that with the aid of AI, it is now possible to detect the likelihood of heart failure up to two years in advance. This groundbreaking discovery has tremendous implications for patient care and overall healthcare outcomes. By identifying potential heart failure cases well in advance, medical professionals can intervene earlier and implement preventative measures that could potentially save lives.

The integration of artificial intelligence into medical practices not only enhances efficiency but also improves patient outcomes by providing valuable insights for timely and accurate diagnoses. As we continue to explore the possibilities offered by AI in medicine, it is evident that this technology is paving the way for a future where early detection and proactive intervention become standard practice in medical care.

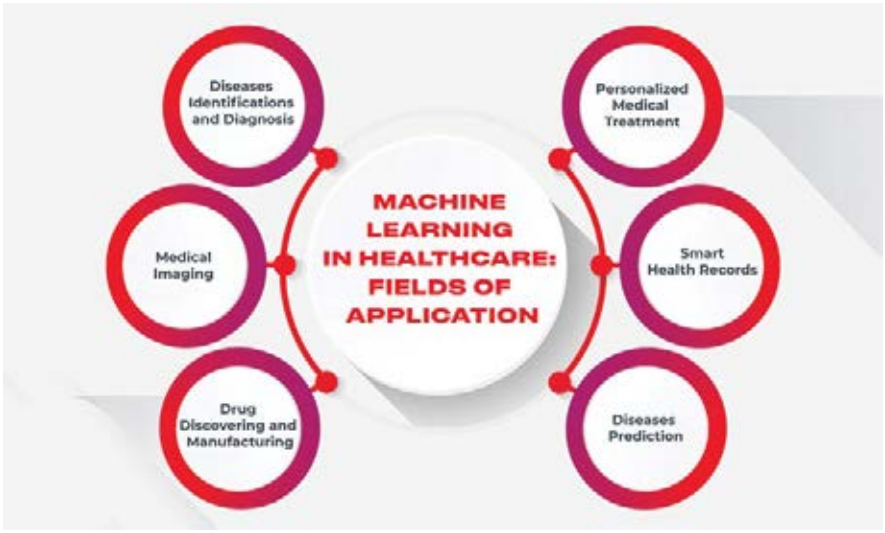
The use of AI in pharmaceutical research holds immense promise for developing new drugs and treatments more efficiently than ever before. Cataract and orthopedic surgeries are now being performed by robots in major hospitals, ensuring precision and minimizing human error. These AI robots act as skilled assistants to doctors, enhancing their capabilities and improving patient outcomes.

The recent discovery of a powerful new antibiotic drug by MIT researchers has opened up new avenues in the fight against bacterial infections. Named 'halicin', this groundbreaking medicine has shown remarkable effectiveness in killing various bacteria, including a strain of tuberculosis that has previously been difficult to treat. Machine learning algorithms enabled scientists to quickly identify patterns and correlations within the vast dataset, leading them to uncover halicin's potent antibacterial properties.

This breakthrough demonstrates how AI can revolutionize drug discovery by accelerating the analysis process and identifying potential treatments that may have otherwise gone unnoticed. In the wake of the COVID-19 pandemic, the use of AI capable robots has skyrocketed by 25 percent within a single year. These intelligent machines have played a crucial role in providing essential services such as delivering medicines and food to patients in isolation. Their ability to navigate through complex environments with ease ensures that patients receive timely care while minimizing human contact.

REVOLUTIONIZING HEALTHCARE: How AI is Paving the Way: For a Transformative Future in India

Indian healthcare is one of the country's largest sectors, representing a booming industry that continues to experience robust growth. This upward trend can be primarily attributed to substantial investments made by both the government and corporate entities towards improving coverage and enhancing the quality of medical products and services. Despite these commendable efforts, India still lags



virus would always involve weighing probabilities. Finding the source at the seafood market was rendered impossible as animals sold at the market were removed before researchers

behind on the Healthcare Access and Quality (HAQ) index, highlighting existing inadequacies within the sector. Moreover, with the emergence of COVID-19, an already challenging landscape has been further exacerbated. However, amidst these adversities lies a potential solution – technology integration in healthcare, specifically Artificial Intelligence (AI).

The synergy between AI and healthcare has become increasingly vital as it enables seamless access to care anytime and anywhere. By unleashing AI's transformative power in health care organizations, Medical Research, Diagnostics and patient health products together, India can aspire to revolutionize its future trajectory in healthcare delivery by bridging gaps in accessibility and achieving optimal health outcomes for all its citizens.

CHALLENGES IN HEALTH CARE WITH AI

Challenges of AI in healthcare underpin

the need to establish rigorous processes for not only ethical and responsible access to data but also providing original data without doctoring for their convenience. Particularly noteworthy is the exceptionally sensitive nature of healthcare data, which demands utmost caution when handling it. This intricate landscape presents additional hurdles as this data is often inconsistent, soiled, and lacking optimization for machine learning endeavors such as development, evaluation, implementation, and adoption research into implementation. What you sow, what you reap. With paramount importance placed on ensuring patient privacy and safeguarding against potential misuse or breaches of this valuable information trove using artificial intelligence-driven algorithms calls for a meticulous investigation.

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What you sow, what you reap. With paramount importance placed on ensuring patient privacy and safeguarding against potential misuse or breaches of this valuable information trove using artificial intelligence...

Searching deep into issues emerging during algorithm deployment in real-world scenarios

becomes imperative while concurrently integrating these "trusted" AI algorithms seamlessly within appropriate workflows. Ethical issues include reliability and safety of data, transparency, and accountability of data, data bias, and effeteness on subjects and patient outcomes. Recognizing these challenges head-on through careful consideration and exploration of potential pitfalls can only pave a path towards establishing reliable mechanisms that uphold ethics while harnessing the transformative power of AI in healthcare without compromising integrity or jeopardizing patient trust.

(The authors are Senior Scientist at CSIR-National Institute of Science Communication and Policy Research/Head, International Cooperation, Department of Science and Technology, New Delhi)

AI: IMPACT & I

Today applications of machine learning and Artificial Intelligence (AI) have the potential to facilitate predictive, preventive, personalized, and participatory medicine customized to the patient's needs....

BY DR AMITAV BANERJEE

MPLICATIONS

A group of scholars cutting across disciplines was the first to articulate the concept of Artificial Intelligence (AI) in the year 1956. John McCarthy, the thought leader of this group, a mathematician, hypothesised, "...Every aspect of learning or any other features of intelligence, can in principle be so precisely defined that a machine can be made to simulate it."

This was a seminal prophesy. It went on to spawn AI and subsequently its progeny machine learning. Over the years, exponential increase in speed and capacities of computers, driven by increasingly smaller chips, greater connectivity, and advances in quantitative epidemiology with predictive models have generated potential for application of AI and machine learning in medicine and public health. Some predict that in coming years AI may replace 80% of doctors.

Applications of machine learning and AI have the potential to facilitate predictive, preventive, personalized, and participatory (P4) medicine customized to the patient's needs. These enable patients to be categorised on their disease subtypes, risk, prognosis or response to

pharmaceuticals on the basis of "in silico" models. "In-silico" (from silicon in computer chips), is the term for computer simulation models.

LESSONS FROM HISTORY

The history of medicine is full of examples where a small step in technology transformed into a giant leap for Medicine.

Science in the laboratory was always ahead of medicine practiced at the bedside. In the early days of primitive medical practice, scientists working in the laboratory commanded more respect than the doctor at the bedside. During this era, modern medicine as we know it now had not arrived. The doctor along with the priest offered palliative terminal care. Hospices were the forerunners of modern day hospitals.

Small steps in science have been giant leaps for Medicine.

Small steps in science meant giant leaps in medicine. The dissection of the human body in 1540 by Vesalius was a giant leap for surgery. The baton was carried forward by Ambroise Pare the father of modern surgery. With the discovery of the antiseptic properties of carbolic acid, used to treat sewage, Joseph Lister could take surgery to newer heights by preventing wound infections. The discovery of anaesthesia was the final giant leap for surgery, propelling it today to the age of minimally invasive and robotic surgery.

Similarly, the discovery of microbes, vaccines and antibiotics propelled rapid advances in medicine, allied disciplines and public health. Non-invasive diagnostic technology such as ultrasonography, computerized axial tomography (CAT Scan), Magnetic Resonant Imaging (MRI), were giant leaps over the diagnostic accuracy achieved by the clinician's five senses.

AI and Machine Learning will similarly impact the future of Medicine in a big way.

> **Science in the laboratory was always ahead of medicine practiced at the bedside. In the early days of primitive medical practice, scientists working in the laboratory commanded more respect than the doctor at the bedside...**

Big data mining and deep learning algorithms have the potential for wide scale applications in medicine particularly in disciplines such as personalized medicine, histopathology and radiology. Diagnostic accuracy of these tools has sometimes surpassed that of specialists in the field.

Radiology may come full circle. In the early seventies, before the arrival of CAT scan, MRI and other advanced technologies, it was not a much sought after speciality. With these non-invasive diagnostic procedures radiology became one of the most sought after specialities. AI and machine learning tools are threatening its position as medicine's most coveted discipline. A professor of radiology at Stanford University received a correspondence from one of his students expressing concern that radiology is not a viable profession anymore!

Geoffrey Hinton, a descendent of

George Boole (famous for inventing Boolean algebra), and a data scientist, predicts that machine will overtake doctors and some specialists will become redundant. He predicts that soon the machine will be more accurate than radiologists and goes to the extent of recommending closure of the discipline! He doesn't spare other medical specialities either. He believes that deep learning algorithms will in the future give histopathology reports, interpret Pap smears, make out abnormal heart sounds and rhythms, interpret skin disorders, and make predictive rules in psychiatric patients.

Deep learning machine can incrementally correct and upgrade quicker than humans. Machine will also increasingly undertake clinical tasks which call for judgment such as ethical appraisals and cost benefit analysis...

Jorg Goldhahn, a Translational Researcher from Switzerland, has similar views. According to him, while doctors may be better than machines presently, soon machine will outdo the physician. Deep learning machine can incrementally correct and upgrade quicker than humans. Machine will also increasingly undertake clinical tasks which call for judgment such as ethical appraisals and cost benefit analysis. According to Goldhahn, doctors will be unable to balance the exponential increase in medical literature and at the same time devote time to patient care, because of sheer volume. Machine learning will solve this stalemate according to him. Natural language processers, like ChatGPT, and related developments, will help doctors to keep abreast with the medical literature, and also negotiate complex pathways for instance on drug interactions and adverse events following medical intervention.

CAN MACHINES EMULATE THE CHARISMA OF OLD WORLD MEDICINE, EPITOMIZED BY DR JOSEPH BELL, THE GRAND DETECTIVE OF MEDICINE?

Clinicians of a past era were keen observers. They were taught to unobtrusively observe right from the moment the patient entered the doctor's office. The demeanour, the stride, the handshake, the voice and other subtle signs provided vital clues to the clinician. Often it helped them to arrive at a diagnosis before the history-taking and clinical examination. Dr Joseph Bell, a Scottish Surgeon at the University of Edinburg in the nineteenth century, had refined these skills to perfection. He inspired one of his students, Arthur Conan Doyle who modelled the iconic fictional detective Sherlock Holmes after him. Will machines be

able to emulate such astute clinicians?

Surprisingly, they may. Sebastian Thrun a former scientist at Stanford University believes they will be able to simulate clinical acumen as well. Machine learning tools may be incorporated into items of daily use. For instance, our phones may detect incipient changes in our voice and help to detect early Alzheimer. The way we manoeuvre the steering wheels of our car may give hint of early Parkinson disease. Our bathtubs can act as scanners with help of ultrasound or MRI to detect any internal tumor.

However, unlike most big data scientists, Thrun is kind to doctors. He says doctors will not be replaced by machines. On the other hand, doctors will perform better, faster and commit fewer errors with the help of these tools.

HOW WILL AI AND MACHINE LEARNING IMPACT PUBLIC HEALTH AND EPIDEMIOLOGY?

In addition to influencing the practice of clinical medicine, AI and Machine learning will have an impact on the practice of Public Health and Epidemiology. India, if it could leverage its large population advantage is favourably placed in maximizing the benefits of AI in public health. Unlike humans who can develop intuition and can be trained in pattern recognition with comparatively fewer examples, the training of AI systems involves a vast number of examples. India with its vast population and huge disease burden, a so called "data dividend," has an opportunity for training AI systems optimally.

Determinants of health may vary from region to region in this vast country. Machine learning tools using big data are ideal for unravelling the epidemiological complexities of most of our public health problems. AI can discern patterns in these complexities. Continuously monitoring using AI systems can predict outbreaks for instance by monitoring footfalls in hospitals and health centres, population movements in fairs and festivals and for work, vector density, meteorological conditions and so on, similar to Google maps displaying traffic situation in real time. It can also identify underserved areas and by piggy-backing on telemedicine can provide health cover to these remote areas.

WILL APPLICATION OF AI AND MACHINE LEARNING IN MEDICINE ALIENATE DOCTORS AND PATIENTS?

We are on the brink of a major paradigm shift at a time when Medicine is passing through a crisis. While the advances in Medicine have been remarkable, it has come at a price, literally, by raising the cost of care exponentially and increasing inequities. And, paradoxically, with advances in medicine, the doctor-patient relationship is at its nadir, with increasing litigations and violence against doctors. This is wrought by technology. The machine acts as a barrier between the doctor and the patient. During a consultation today, the doctor's gaze is fixed on

AI enabled voice and image recordings will make Electronic Health Records extinct. This will offer physicians the gift of time...

the computer screen accessing the patient's investigation reports, or entering details for the Electronic Health Records with no time to spare for a personal interaction with the patient. While the treatment and management of the disease may be state of the art, the rapport with the patient is missing. Cure without care is the norm, technology has converted hospitals to factories and doctors into assembly line workers. Most doctors and patients are unhappy in this environment, with burnouts among the former, and increasing litigations and violence against doctors by the latter.

Any technological advance has its teething troubles. Modern technology may be presently facing this. AI and Machine Learning while they seem threatening to most actually bring us hope. Provided they are used appropriately and optimally. While they may seem disruptive in the short run, in the long run they can make medical care more humane. Future developments in AI and Machine Learning may bring back the past when the physician's empathy, communication skills and personal attention to the patient contributed to the healing process.

Doctors using AI and Machine Learning tools will be spared from the mundane tasks which take up most of their time presently. To give one example, AI enabled voice and image recordings will make Electronic Health Records extinct. This will offer physicians the gift of time which if properly used can revive the presently fragile doctor-patient relationship. They will have time to communicate better with their patients. According to some projections time for such interactions will increase by 25%.

The machine may outperform the doctor in most tasks. However, the machine, howsoever fast and accurate in performing repetitive tasks, pattern and image recognitions will come to a dead end when faced with social and cultural determinants of health and disease. Here the doctor will outperform the machine. Patients welcome the human warmth of direct interaction with the doctor. Machines with all their precision and accuracy can at the most provide perfect but sterile health care without the soul. Doctors will be able to give quality time to their patients and bring back the lost art to medicine.

(The author is Professor in Community Medicine, DY Patil Medical College, Pune and an Academic Editor of PLOS ONE)

LIVER MAN OF INDIA: DR S K SARIN

Meeting world fame gastroenterologist Dr S K.Sarin at Institute of Liver and Biliary Sciences (ILBS), New Delhi was an uplifting experience that filled Double Helical Team with inherently positive vibes and immensely feel-good factor.....

During an hour-long conversation with him, he dwelt at length on the benefits of healthy liver which by harmonizing our inherent natural life-force helps to eliminate sickness and restore positive health and total wellness.

With outstanding contribution and top notch performance in medical education, Dr Sarin is well known as top gastroenterologist, hepatologist, a pioneer in clinical innovations, a gifted teacher, and a hybrid with great insights into basic and clinical

research. Today no amount of appreciation can do justice with his talent, goodness, generosity, greatness and kindness. At present he is working as Chancellor and Director at the Institute of Liver and Biliary Sciences (ILBS), the first of its kind in Asia. ILBS is the first, cost-effective and most comprehensive Liver Set-up in the region.

Dr Sarin approach for primary prevention of variceal bleeding by band ligation has become the standard of care worldwide. Similarly, the management protocols on Gastric Varices; and the nomenclature bearing his name as 'Sarin's Classification of Gastric Varices" are universally followed. He has more than 350 International publications to his credit, including The New England Journal of Medicine, The Lancet, Annals of Internal Medicine, Gastroenterology and Hepatology.

His deep interest in physiology has recently resulted in the development of a unique model of endotoxemia induced portal hypertension and liver disease. He has helped describe two new disease entities, portal biliopathy, and 'Acute-on-Chronic Liver Failure".

Dr Sarin is credited globally to give a huge number relevant and new protocol for the management of patients with hepatitis and cirrhosis of the liver and its complications. His recent contributions in the field of liver regeneration using growth factors has a great potential for patients with advanced liver disease and liver failure so as to provide options of transplant free survival. His outstanding contribution to develop 17 major treatment guidelines, including spearheading five major Asian Pacific Treatment Guidelines in Liver diseases; are being widely quoted and practiced.

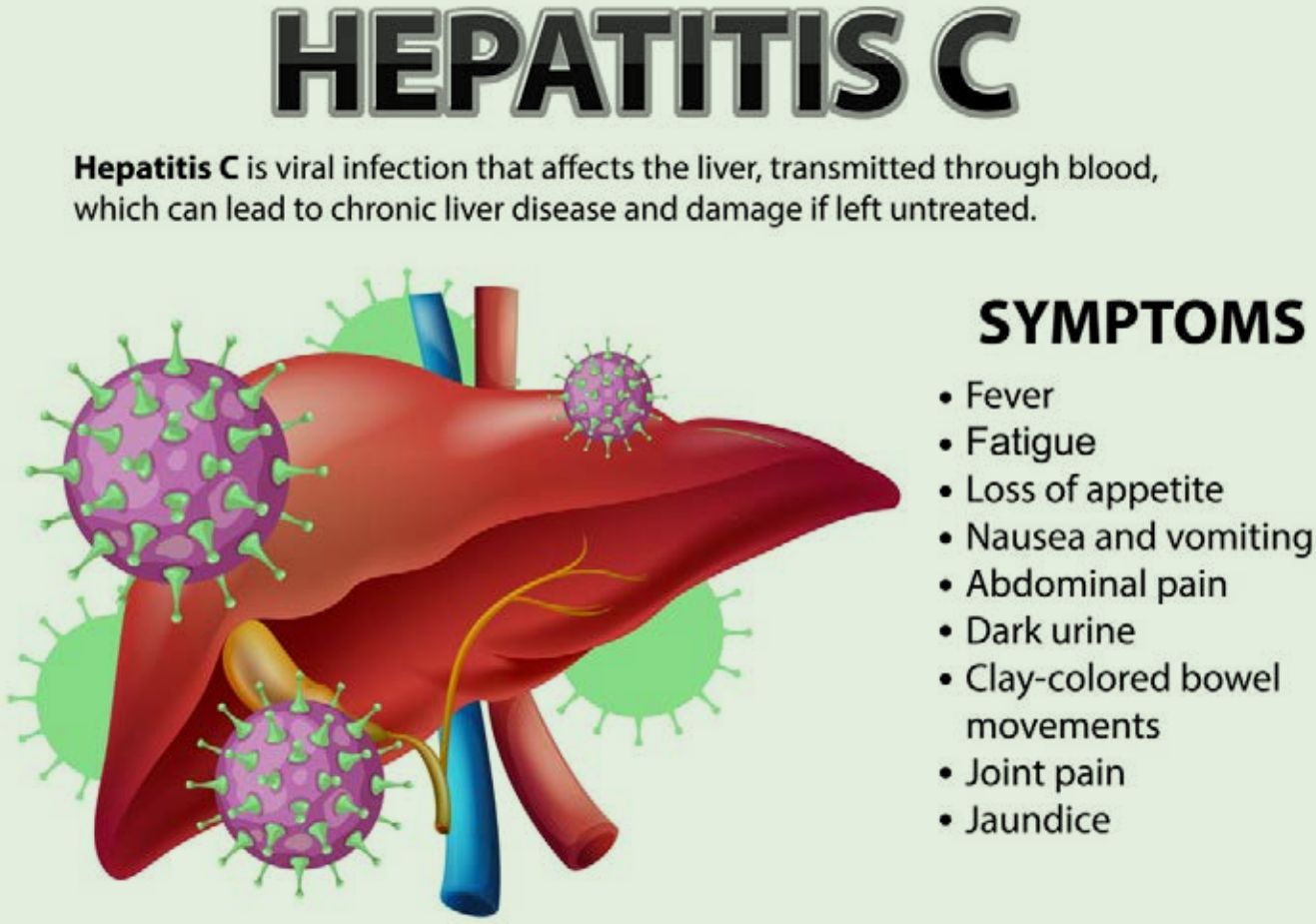
He has also immensely contributed to the field of hepatitis B, C and liver cancer. He is instrumental in changing the nomenclature of 'Hepatitis B carrier' to "Chronic HBV Infection". The treatment options and pathogenesis of these diseases have been greatly advanced by his work. He is deeply involved in preventing and protecting new born babies from HBV transmission. His group showed that the mother baby transmission is the major route of transmission of hepatitis B in India. He also showed for the first time that the newborns born to these mothers are already chronically infected with HBV. The treatment of hepatitis B and C, alcoholic liver disease and liver cancer are specially looked after by him.

Along with the team of experts from Asia, he has been able to define a new disease entity, Acute on Chronic Liver Failure (ACLF). Since such patients have a high mortality, the need for protocol based treatment and special intensive care management has been established through his efforts. This has led to improved outcomes by their team

Prof. Sarin, with his intense dedication, vision and work, is a role model for the country. He has been bestowed with Padma Bhushan by the Govt of India. He is also the recipient of several other awards, apart from this he is one of the most sought teachers, invited speaker nationally and internationally, and has been awarded the "Gifted Teacher Award" by the Association of Physicians of India.

According to Dr S K Sarin, the problem of liver disease was always there. Even in 2000 BC there were no worship of god and goddess in the temples. The liver was only kept. There was great importance of liver in Babylonians times. Because people knew that liver is the centre of the body. Heart was only discovered 400 to 500 years ago. Liver is sheet of your body as pillar. This is also largest and very tolerant organ of the body. So if you are not careful about your liver than it becomes worse. Lot of times what you eat and what you drink, liver can tolerate but after a while it revolts.

Today common causes of liver disease are obesity, overweight, excess fat, alcohol and no knowledge of Hepatitis B and C virus. Non judicious of use of drugs is also one of the causes of liver disease. Liver carries out over 500 tasks and plays an essential role in digestion. Its roles include detoxification, protein



synthesis, and producing digestive enzymes. The roles of the liver include detoxification, protein synthesis, and the production of chemicals that help digest food. It is part of the digestive system.

ROLE OF LIVER

Liver is as a solid organ, located in the right upper part of the abdomen just below the rib cage. It is a complex organ both structurally and functionally. Liver is a pivotal organ for metabolic functions of our body. The function of liver can be categorized into two major groups: excretory function and synthetic function. Most foreign substances and waste product made in body are metabolized within the liver before being excreted via bile or kidney. Excretion of bilirubin from liver is important as defect in bilirubin excretion leads to jaundice. Liver is the site of synthesis of all major proteins in body. These proteins are building blocks for all important functions in body. Bile is synthesized in liver and which helps in digestion of fat in body. Liver also plays an important role in fat and carbohydrate metabolism.

SYMPTOMS OF LIVER DISEASE

Early or mild form of liver diseases may give rise to non-specific symptoms like fatigue or weakness. Significant liver injury can cause jaundice, which means yellow discoloration of sclera of eye ball and is associated with dark yellow urine. Liver cirrhosis results from persistent damage to liver due to any cause (alcohol, hepatitis B & C). Common manifestations of liver cirrhosis are ascites (accumulation of fluid in the abdomen), loss of consciousness (coma) and bleeding from gastrointestinal tract in form of vomiting of blood.

TYPES OF LIVER DISEASE

Liver diseases are of two types: (a) Short lasting and self limiting which resolves completely without causing any permanent damage or functional impairment and (b) Smoldering slow diseases which cause a permanent damage to liver which is manifest as "liver cirrhosis".

Among the hepatitis viruses, Hepatitis A and E causes jaundice, which is self-limiting. Unlike other types of viral hepatitis, hepatitis A does not cause long-term liver damage, and it does ntt become an

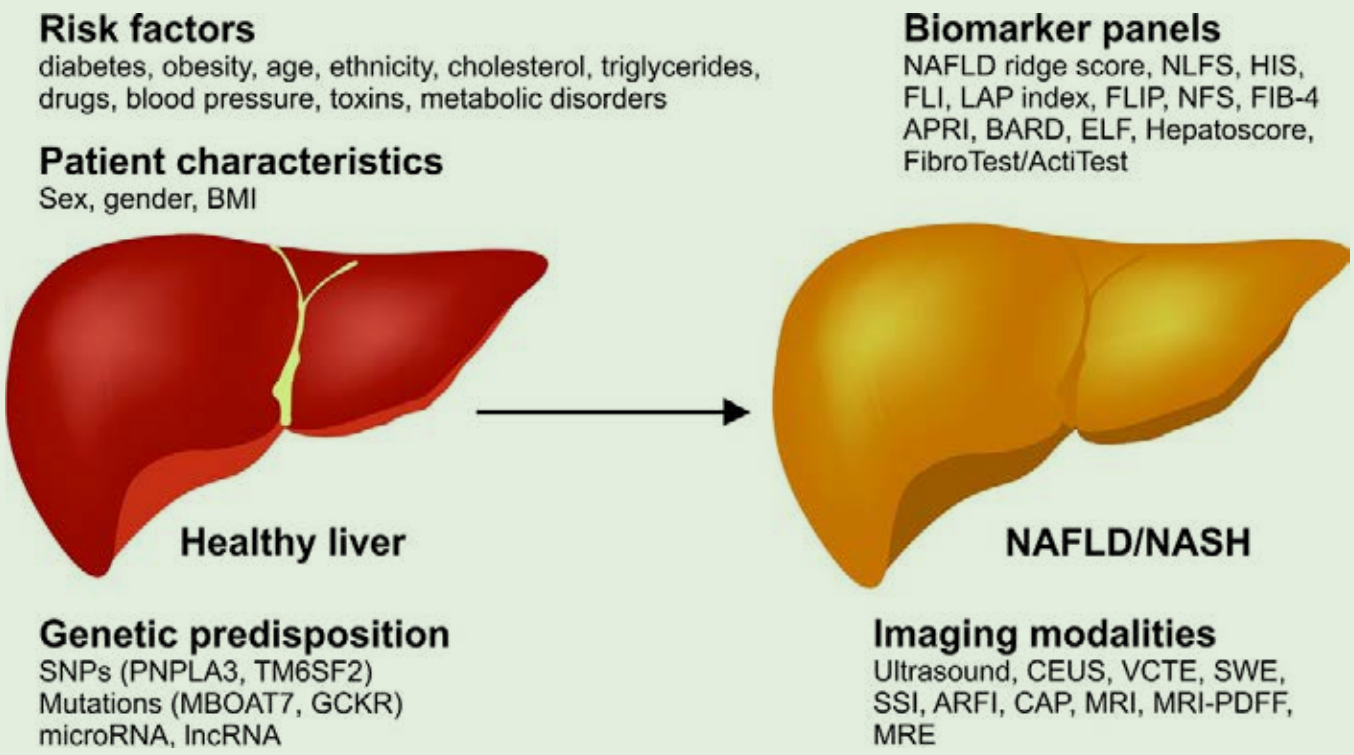
ongoing chronic infection. In rare cases, hepatitis A can cause a sudden or acute loss of liver function, especially in older adults or people with chronic liver diseases. Hepatitis A and E are spread by contaminated food and water. Thus if we have safe drinking water supply and pay attention to hygiene these diseases can be prevented. There is vaccine available for hepatitis A and can be used safely at any age. There is no vaccine available for hepatitis E at present but safe drinking water could be the most effective measure to control hepatitis.

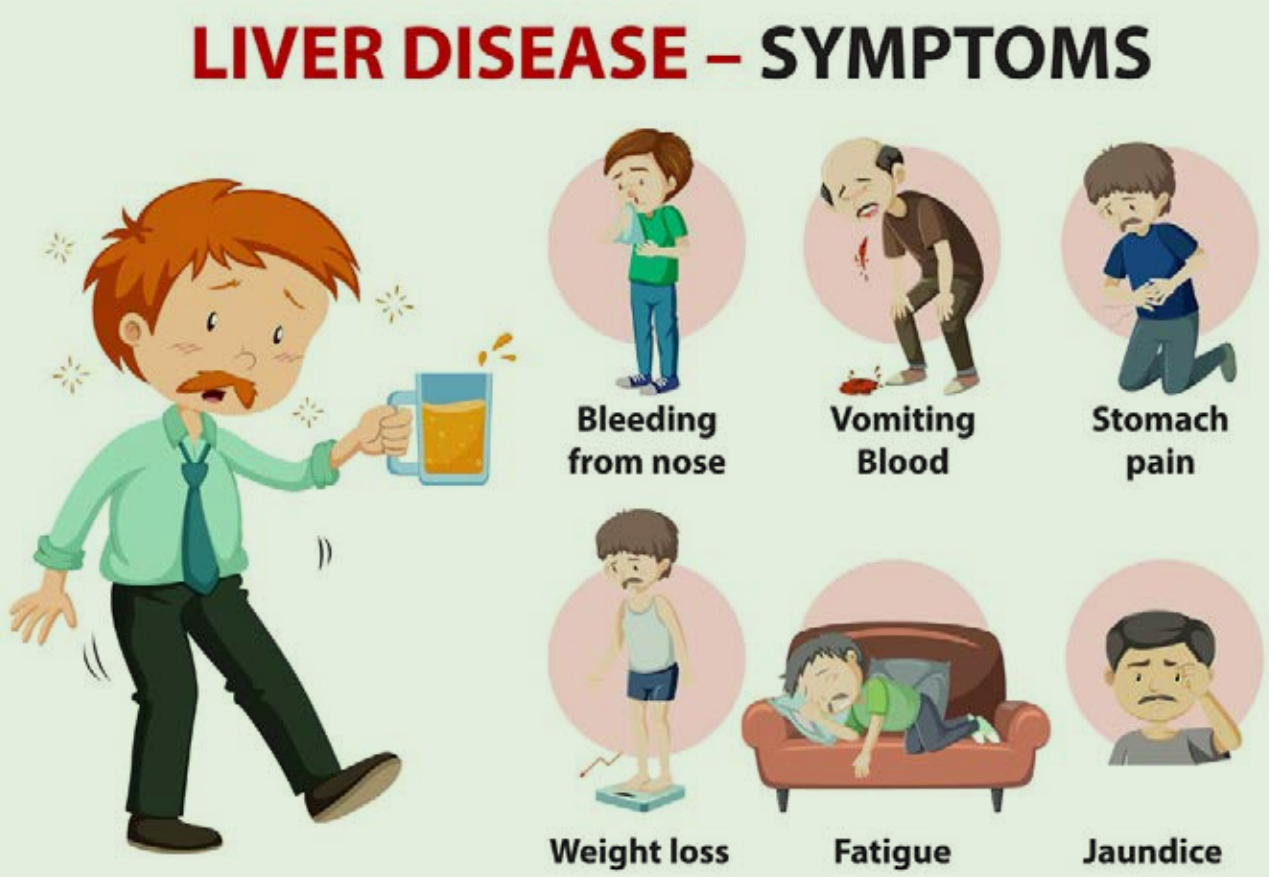
Hepatitis B and C cause chronic infection of liver, which can be cause cirrhosis of liver. Hepatitis C is the leading cause of cirrhosis worldwide. In our country hepatitis B is a major challenge. Both hepatitis B and C are spread by blood transfusion, needle sharing, sexual contact and from mother to child. Thus to a large extent these things are preventable by simple measures like improving our testing in blood bank, increasing awareness for voluntary blood donation, educating people against reuse or needle sharing and safe sex practices. In addition we have a very effective vaccine against hepatitis B. There is no vaccine against hepatitis C is as yet. Hepatitis C has a very high prevalence in parts of India where intravenous drug abuse is rampant. Public awareness is the most important tool in preventing the spread of this disease.

Today intake of alcohol has become most socially accepted poison. In ILBS there are over 48 percent of liver disease patients due to high consumption of alcohol. Alcohol is very important cause of liver disease. Alcohol consumption has increased across all social, age and gender groups. Awareness about alcohol consumption is of paramount importance in preventing liver disease. Lack of self help groups and social stigma in approaching them prevents people in need of help from coming out in open. We need a massive public awareness campaign to educate people about safe and responsible alcohol consumption.

Fatty liver is a condition usually picked up incidentally on routine ultrasound and investigation for deranged liver function tests. It is a slowly progressive disease but in a significant number of subjects can lead to liver cirrhosis over years to decades. The most common causes for fatty liver are obesity and diabetes. The epidemic of fatty liver has grown with rise in these lifestyle diseases. In western world it is already the second most common cause of liver cirrhosis after hepatitis C. Prevention remains the cornerstone of treatment of treatment of fatty liver. Adopting a healthy lifestyle with dietary precautions are more effective than medication in early course of this disease.

According to Dr Sarin, fatty liver is the first part of development of other systemic problems. Eating excess calories causes fat to build up in the liver. When the liver does not process and break down fats as it normally should, too much fat will accumulate. People tend to develop fatty liver if they have certain other conditions,





such as obesity, diabetes or high triglycerides.

As per report, 1.5 billion people have fatty liver disease in all over the world while in India more than 250 million have fatty liver disease. In India, 1 in 3 has liver disease. Diabetes raises risk of nonalcoholic fatty liver disease. In this condition, fat builds up in liver even if one drinks little or no alcohol. At least half of people living with type 2 diabetes have non alcoholic fatty liver disease. Basically Fatty liver may cause no damage, but sometimes the excess fat leads to inflammation of the liver. When glucose levels are elevated in the context of pre-diabetes or overt diabetes, this provides further substrate for triglyceride synthesis. Additionally, impaired very low density lipoprotein secretion, which commonly occurs with insulin resistance, further contributes to hepatic fat accumulation. Fatty liver disease is a common condition caused by the storage of extra fat in the liver.

Most people have no symptoms, and it does not cause serious problems for them. In some cases, though, it can lead to liver damage. The good news is you can often prevent or even reverse fatty liver disease with lifestyle changes. The most important thing to recognize about liver disease is that up to 72 percent of individuals with underlying liver disease have no symptoms. The most common symptoms are very non-specific and they include fatigue or excessive tiredness, lack of drive, and sometimes itching. It has been seen that obesity and alcohol consumption, which are common and increasing in many parts of the world, have become key liver disease risk factors. Historically, viral hepatitis has been the leading etiology for chronic liver disease. However, improved prevention strategies and treatment have led to improving chronic liver disease trends.

TREATMENT

1. Avoid Cigarette and alcohol as both are socially accepted poison
2. Hepatitis B vaccination
3. Avoiding reuse of needles, sharing needles.
4. Promoting voluntary blood donation and improving surveillance of blood products
5. Control of obesity
6. Safe drinking water
7. Avoiding unprescribed medications (non judicious use of drugs)
8. Avoid outside food, eat only homemade food.

DISABILITY

THE WAY FORWARD

Disability is now understood to be a human rights issue. People are disabled by society, not just by their bodies. These barriers can be overcome if governments, nongovernmental organizations, professionals and people with disabilities and their families work together……

BY DR, SUNEELA GARG

People with disabilities are among the most marginalized groups in the world. People with disabilities have poorer health outcomes, lower education achievements, less economic participation and higher rates of poverty than people without disabilities. They also report seeking more health care, have greater unmet needs and are particularly vulnerable to deficiencies in health care services.

Any restriction or lack of ability to perform an activity in a manner or within the range considered normal for the human beings,

resulting from impairment is termed as disability. Impairment concerns the physical aspects of health; disability is the loss of functional capacity resulting from an impaired organ; handicap is a measure of the social and cultural consequences of an impairment or disability. The types of disability include locomotor, hearing, speech, visual and mental disability.

A recent development is the International Classification of Functioning, Disability and Health (ICF) developed by WHO in 2000. The ICF defines disability as an umbrella term for impairments, activity limitations and participation restrictions. Disability is the interaction between individuals with a health condition (e.g. cerebral palsy, Down syndrome and depression) and personal and environmental factors (e.g. negative attitudes, inaccessible transportation and public buildings, and limited social supports).

GLOBAL SCENARIO:

The WHO's Global Burden of Disease study starts with the preva¬lence of diseases and injuries and

distributions of limitations in functioning – where available – in different regions of the world, and then estimates the severity of related disability.The analysis of the Global Burden of Disease 2004 data for the World Report on Disability estimates that 15.3% of the world population (some 978 million people of the estimated 6.4 billion in 2004) had "moderate or severe disability", while 2.9% or about 185 million experienced "severe dis¬ability". Among those aged 0–14 years, the figures were 5.1% and 0.7%, or 93 million and 13 million children, respectively. Among those 15 years and older, the figures were 19.4% and 3.8%, or 892 million and 175 million, respectively.

According to Census 2011, over 26 million people in India as suffering from one or the other kind of disability. This is equivalent to 2.21% of the population. Among the total disabled in the country, 15 million are males (2.41%) and 11.8 million are females (2.01%). There is a slight increase in disability among both sexes over the past decade.

Among the eight types of disabilities on which data has been collected, the prominent ones are related to movement (20.3%), hearing (18.9%) and seeing (18.8%). The disabled by sex follow a similar pattern exceptin visual and hearing disabilities where the proportion of disabled females is higher.

INDIA:

Disability-Specific Data:
Movement – 20.3%
Seeing - 18.8%
Hearing - 18.9%
Speech – 7.5%
Mental retardation – 5.6%
Mental Illness – 2.7%
Any other – 18.4%
Multiple disability – 7.9%
(Source: Census India 2011)

DISABILITY IN CHILDREN:
The functioning of a child should be seen not in isolation but in the context of the family and the social environment. Children under age 5 in developing countries are exposed to multiple risks, including poverty, malnutrition, poor health, and unstimulating home environ¬ments, which can impair cognitive, motor, and social-emotional development. Children screening positive for increased risk of dis¬ability are less likely to have been breastfed or to have received a vitamin A supplement. As the severity of stunting and being underweight increases, so does the proportion of children screening positive for risk of disability. An estimated 200 million children under age 5 fail to reach their potential in cognitive and social-emotional development.90% of children with disabilities in developing countries do not attend school, according to UNESCO.

DISABILITY IN YOUTH:

Adolescents and youth with disabilities are among the neediest and most overlooked of all the world's children.In the developing countries this figure is between 75 and 150 million, with significant increase in their numbers predicted over the next few decades. Young people are at a greater risk of acquiring a disability due to work related injuries, risk taking behaviour such as extreme sports, motor vehicle accidents, experimentations with drugs, unprotected sex, and indeed through violence and warfare.

DISABILITY IN WOMEN:

Women with disabilities are recognized to be multiply disadvantaged, experiencing exclusion on account of their gender and their disability. Women with disabilities are more likely to be victims of violence or rape, according to a 2004 British study, and less likely to obtain police intervention, legal protection or preventive care.A small 2004 survey in Orissa, India, found that virtually all women and girls with disabilities were beaten at home while 25% of women with intellectual disabilities had been raped and abused.

DISABILITY IN ELDERLY:

Global ageing has a major influence on disabil¬ity trends. Higher disability rates among older people reflect an accumulation of health risks across a lifespan of disease, injury, and chronic illness.Older people are disproportionately repre¬sented in disability populations. Rates of disability are much higher among those aged 80 to 89 years, the fastest-growing age cohort worldwide, increasing at 3.9% a year and projected to account for 20% of the global population 60 years or older by 2050.

HOW ARE THE LIVES OF PEOPLE WITH DISABILITIES AFFECTED?

People with disabilities are particularly vulnerable to deficiencies in health care services.

a) Secondary conditions - Secondary conditions occur in addition to (and are related to) a primary health condition, and are both predictable and therefore preventable. Examples include pressure ulcers, urinary tract infections, osteoporosis and pain.

b) Co-morbid conditions - Co-morbid conditions occur in addition to (and are unrelated to) a primary health condition associated with disability. For example the prevalence of diabetes in people with schizophrenia is around 15% compared to a rate of

2-3% for the general population.

c) Age-related conditions - The ageing process for some groups of people with disabilities begins earlier than usual. For example some people with developmental disabilities show signs of premature ageing in their 40s and 50s.

d) Engaging in health risk behaviours - Some studies have indicated that people with disabilities have higher rates of risky behaviours such as smoking, poor diet and physical inactivity.

e) Higher rates of premature death - Mortality rates for people with disabilities vary depending on the health condition. However an investigation in the United Kingdom found that people with mental health disorders and intellectual impairments had a lower life expectancy.

BARRIERS TO HEALTH CARE:

a) Prohibitive costs - Affordability of health services and transportation are two main reasons why people with disabilities do not receive needed health care in low-income countries.

b) Limited availability of services - The lack of appropriate services for people with disabilities is a significant barrier to health care. For example, research in Uttar Pradesh and Tamil Nadu states of India found that after the cost, the lack of services in the area was the second most significant barrier to using health facilities.

c) Physical barriers - Uneven access to buildings, inaccessible medical equipment, poor signage, inadequate bathroom facilities, and inaccessible parking areas create barriers to health care facilities.

d) Inadequate skills and knowledge of health workers - People with disabilities were more than twice as likely to report finding health care provider skills inadequate to meet their needs, four times more likely to be treated badly and nearly three times more likely to be denied care.

STRATEGIES:

a) Enable access to all mainstream systems and services -Mainstreaming is the process by which governments and other stakeholders address the barriers that exclude persons with disabilities from participating equally in any service intended for the general public, such as education, health, employment, etc. This requires changes to laws, policies, institutions and environments.

b) Invest in programmes and services for people with disabilities -Some people with disabilities may require access to specific measures, such as rehabilitation, support services, or vocational training, which can improve functioning and independence and foster participation in society.

c) Adopt a national disability strategy and plan of action -All sectors and stakeholders should collaborate on a strategy to improve the well-being of people with disabilities. This will help improve coordination between sectors and services.

d) Involve people with disabilities -In formulating and implementing policies, laws and services, people with disabilities should be consulted and actively involved. At an individual level, persons with disabilities are entitled to have control over their lives and therefore need to be consulted on issues that concern them directly.

e)Improve human resource capacity -Human resource capacity can be improved through effective education, training and recruitment. For example training of health professionals, architects and designers should include relevant content on disability and be based on human rights principles.

f) Provide adequate funding and improve affordability -Adequate and sustainable funding of publicly provided services is needed to remove financial barriers and ensure good quality.

g) Increase public awareness and understanding about disability -Mutual respect and understanding contribute to an inclusive society. It is vital to improve public understanding of disability, confront negative perceptions, and represent disability fairly.

h) Improve the availability and quality of data on disability -Data need to be standardized and internationally comparable to benchmark and monitor progress on disability policies and on the implementation of the CRPD nationally and internationally. At the national level, dedicated disability surveys can also be carried out to gain more comprehensive information.

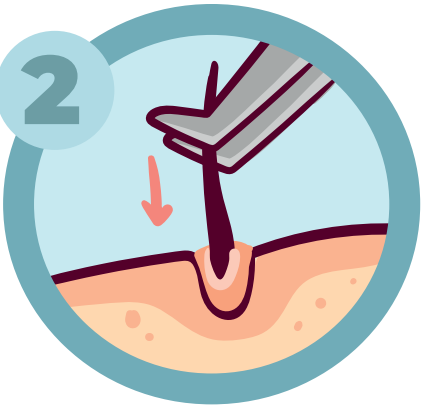
Strengthen and support research on disability -Research is essential for increasing public understanding about disability, informing disability policy and programmes, and efficiently allocating resources. More research is needed, not just about the lives of people with disabilities, but also about social barriers, and how these can be overcome..

(The author is former HOD, Department of Community Medicine, Maulana Azad Medical College, New Delhi)


1

RESTORE YOUR HAIR

The hairs are extracted individually.



Grafts are placed in small cuts made in the scalp.

New hair usually appears after 6 months.

Hair transplantation is a surgical technique that removes hair follicles from one part of the body, called the donor site, to a bald or balding part of the body known as the recipient site……..

BY DR. VIJAY SINGHAL

The technique is primarily used to treat male pattern baldness. For successful hair transplants, grafts must survive and adapt to new areas where they are transplanted. Clinical studies show that about 85-95% of all implanted grafts easily grow in the transplanted area. This high percentage indicates that hair transplants are generally very successful. A hair transplant can last a lifetime.

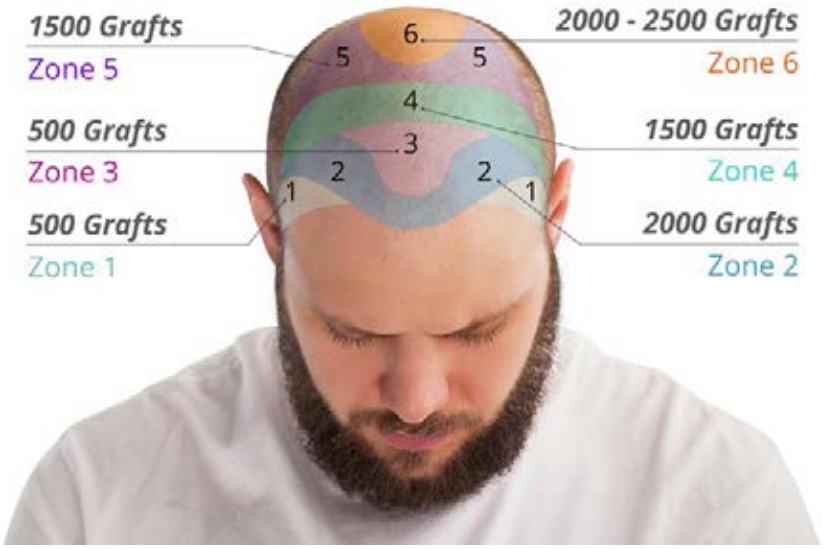
Hair transplantation, a surgical technique, allows the doctor to single out the permanent hair on the back of the patient's head and use them as the transplanted hair to the bald spots. The hair at the back of our heads are permanent and do not suffer any damage through age, which is why these hair are chosen for the process. This procedure is quite similar to the technique wildly used in flora where a plant can be transferred from one place to another. The process allows the patient to have normal hair like before, which can be shaved, cut, trimmed, coloured or anything they wished.

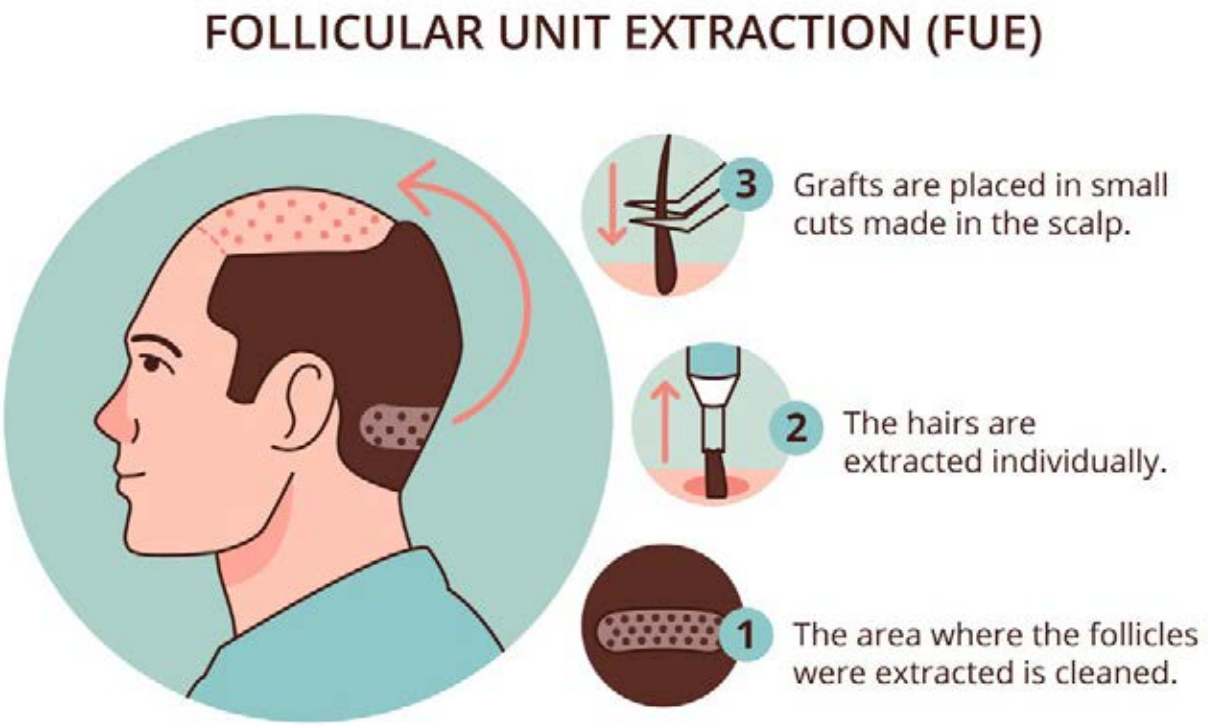
HOW IT IS DONE ?

THE WHOLE PROCEDURE INVOLVES THREE STEPS:

Graft extraction: Extraction of the hair follicles from the back of head. It is done under local anesthesia, and can be carried out in two ways- FUT or FUE.

FUT (Follicular Unit Transplant):





In this way, a strip is taken from the back of the head, aka donor area, and later the space is stitched. The stitches require around two weeks' time to heal and are removed after.

FUE (Follicular Unit Extraction): This method is less extreme as individual hair are extracted from the donor area, creating no need of stitches.

Graft Preparation: Hair in the strip are cut and separated into individual hair follicles.

Graft Insertion: Tiny holes are made in the bald spots so that the hair can be placed for the final growth.

Economic Factor: The cost of the transplant is varient from patient to patient. The money required is subjective as it depends on the number of hair a patient wants to get transplanted.

Suitability: The suitability again depends on the patient. Both of the techniques are extremely good and suitable, but it also depends on the technique the doctor is more comfortable performing. Using in the cases of Andgrogenetic.

Guarantee: There is no need to worry about the prodecure or the result. We need all the factors you bring in the equation, and we guarantee long lasting effects of the transplant.

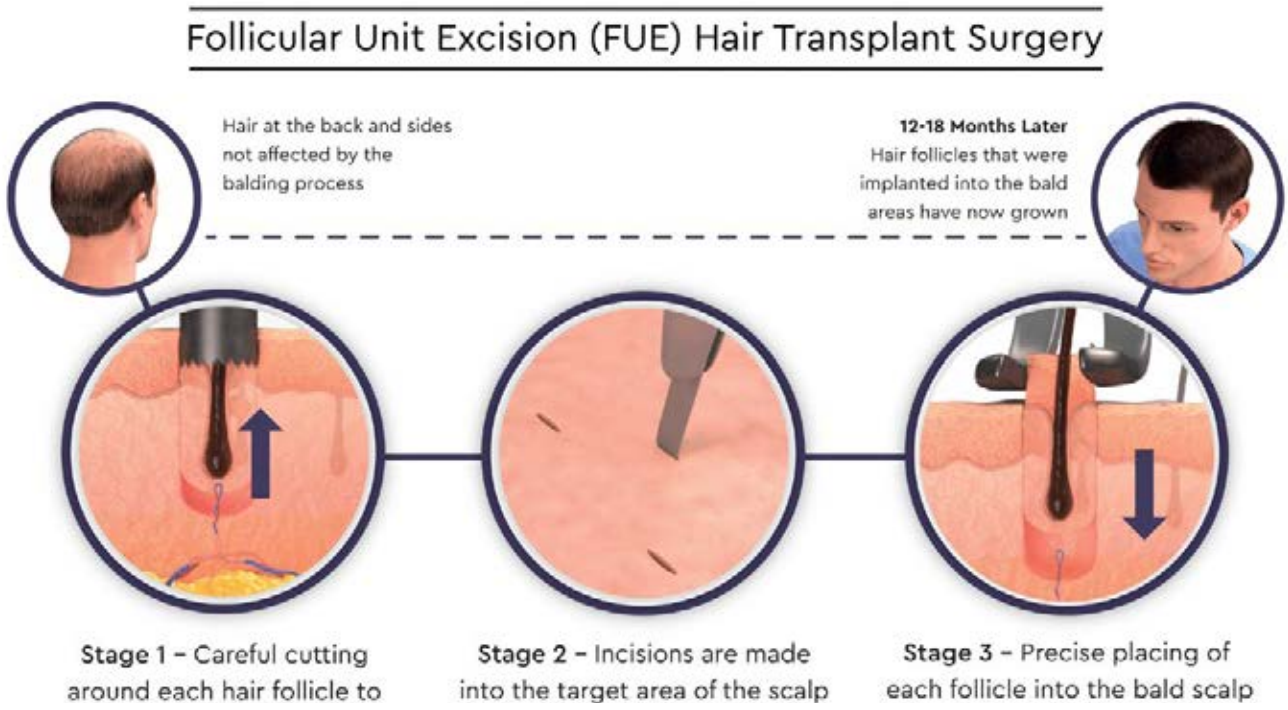
Permanence: The hair transplants are taken from the donor area because they are permanent and last as long as your life does. After the transplant, your hair will be stronger and better.

Safety: The procedure is extremely safe, leaving nothing to worry about. All the precautions that can be taken are taken. Done under Local Anesthesia, the patient is relaxed enough to watch a movie, listen to songs, attend phone calls etc. The patient is free to resume their normal routine right after the procedure.

Natural Looks: Though it may look like a scientific procedure, but designing a natural looking hairline is nothing less than an art. Special focus is giving to all the details to make the hairline look natural, and in such an effort, transplanted hair and natural hair are blended together to make a perfect mix.

Hair transplantation, a surgical technique, allows the doctor to single out the permanent hair on the back of the patient's head and use them as the transplanted hair to the bald spots....

(The author is well known senior consultant dermatologist)



PHARMA INDUSTRY

AND REGULATORY CHALLENGES

After Covid-19 in the year 2020, the Indian Pharmaceutical Industry has emerged as a beacon of hope.....

BY SHANKAR SENGUPTA

In India the pharma Industry is doing a commendable job by not only exporting vaccines but also drugs, and medical equipments all over the world. The industry justifiably earned a global profile and India came to be known as the "Pharmacy of the world."

However, recently there have been some adverse reports over the efficacy of drugs manufactured in India. In February 2023, Global Pharma Healthcare recalled its eye drops which have been linked to vision loss and even deaths in the United States. In December 2022, there were reports that 18 children died in Uzbekistan after consumption of syrup formulation manufactured by Marion Biotech. In October 2022, four cough syrups namely Promethazine Oral Solution, Kofexmalin Baby Cough Syrup, Makoff Baby Cough Syrup and Magrip N Cold Syrup manufactured by Maiden Pharmaceuticals were linked to the deaths of 70 children in The Gambia. About 12 people reported adverse events in Srilanka after the use of an aesthetic and ophthalmic drugs manufactured in India.

Taking cognizance of these reports, the union government has taken a series of measures to ensure that drug manufacturing companies manufacture drugs and pharmaceuticals which adhere to statutory rules and regulations. Teams of central and state drug regulators have fanned out across the country and conducted surprise inspections of pharmaceutical manufacturing units to ensure that there is no compromise in the production of medicines and that all regulatory standards are followed.

Regulators conducted inspections in about 200 units from Andhra Pradesh to Himachal Pradesh and Gujarat to West Bengal and Sikkim. The Hindustan Times in its edition dated

Central Government is planning to bring in a new Drugs, Medical Devices and Cosmetics Bill, 2023 which will replace the Drugs & Cosmetics Act. The Act will deal with rules for importing, manufacturing and selling medicines in India...

21 June 2023, reported that special squads have been constituted by central and state regulators to conduct surprise checks. Nearly 70 companies were issued show-cause notices. The licenses of 18 manufacturing units were suspended because of the lapses found in manufacturing processes. India's drug regulators continue to remain in touch with fellow drug regulators, particularly from countries that report adverse drug reactions from the use of India made drugs.

In order to ensure that only quality products get exported, the Director General of Foreign Trade, Ministry of Commerce has ordered that from June 2023 onwards, it is mandatory for cough syrup manufacturers to get their stocks tested at a government laboratory before being cleared for export. Among the government laboratories are the Indian Pharmacopoeia Commission, Ghaziabad, and the Central Drug Testing Laboratories at Kolkata, Chennai, and Mumbai. The laboratories too have been asked to clear the samples of cough syrups on priority to prevent unnecessary delay of shipments.

As per report, the government has made it compulsory for all drug manufacturing firms belonging to the micro, small and medium enterprises sector to follow good manufacturing practices detailed in the Schedule M of the Drugs & Cosmetics Act. This will go a long way in ensuring the quality assurance of drugs manufactured in India.

In order to tighten the regulatory framework for manufacturing units, the Central Government is planning to bring in a new Drugs, Medical Devices and Cosmetics Bill, 2023 which will replace the Drugs & Cosmetics Act. The Act will deal with rules for importing, manufacturing and selling medicines in India. The bill also aims to ensure the quality, safety, efficacy, performance, and clinical trial of new drugs.

The Drug Controller General of India is planning to come out with a unified online portal for effective regulatory oversight which will ensure quality of drugs and patient safety. The unified portal will ensure accountability of manufacturers, retailers and wholesalers. In the long term, all these steps will help to ensure that all drugs manufactured in India compulsorily comply with the regulatory standards and help to retain the goodwill in the market for India-made drugs and pharmaceuticals.

(The author is librarian, Delhi Institute of Pharmaceutical Research and University, New Delhi)

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