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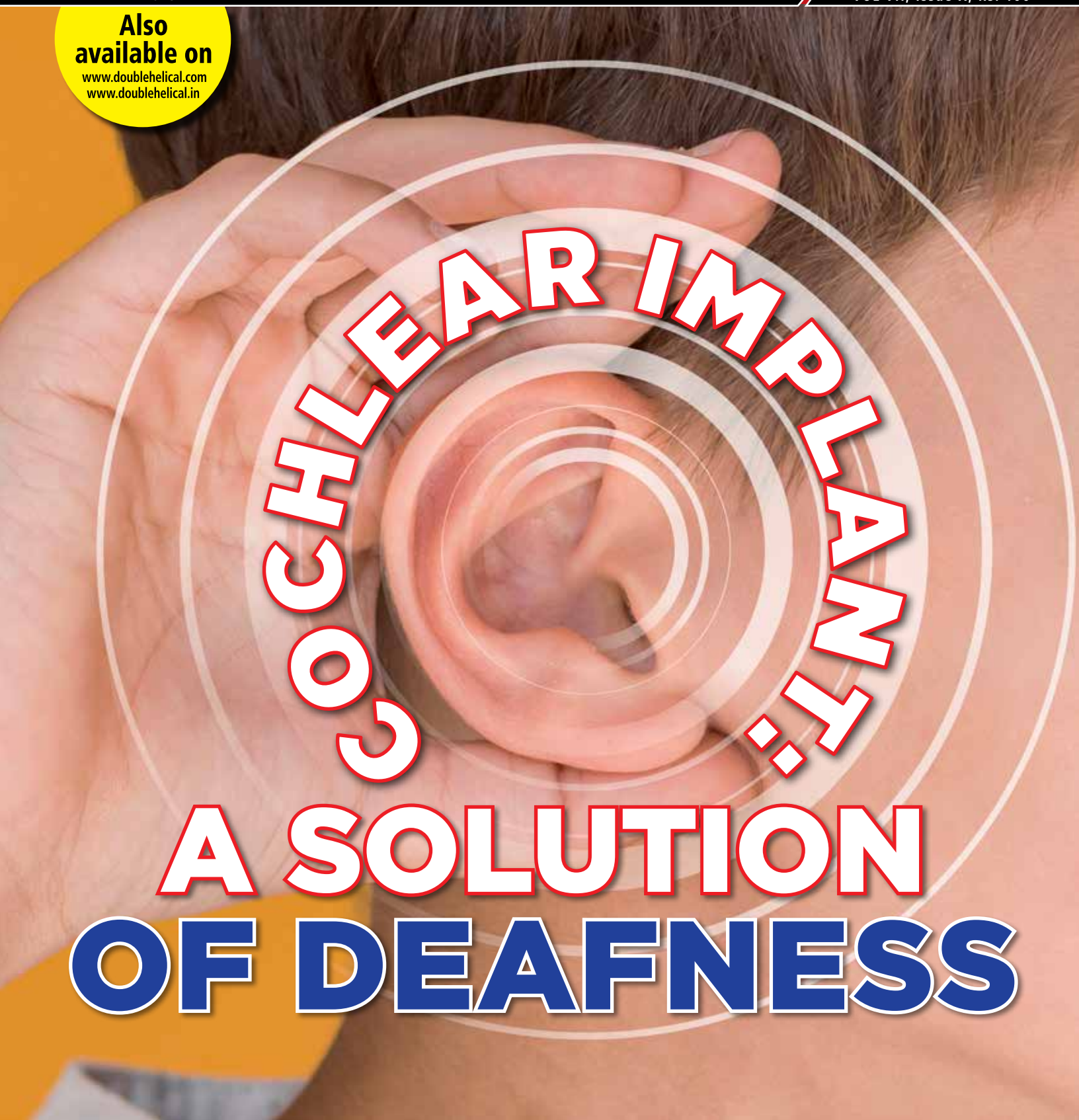

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Covid-19: Is like fix eyes on the ball.....

Dear Readers,

Over the past seven decades, we have witnessed path-breaking changes in terms of innovation, research and development in the medical field. With seminal contribution to the furtherance of medical science, Indian doctors and medical experts have made their country proud in the eyes of the world.

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.

The magazine provides a platform to recognize innovation, people, products and services that are helping to transform the healthcare sector in the country and ushering in affordable, high quality and inclusive healthcare for masses.

Today, Covid-19 is constantly evolving into new, more dangerous, transmittable, and evasive strains. The current scenario of Covid-19 in all over the world is like fix eyes on the ball and this bouncer will pass by harmlessly.

In response to reports of Covid-19 surge in many countries, particularly China & Japan, the Ministry of Health and Family Welfare, Government of India, issued fresh guidelines reiterating the fivefold strategy of test-track-treat-vaccinate and Covid Appropriate Behaviour,

According to experts, Covid-19 appears to be spreading less widely than before, but it actually continues to mutate and create new forms every day. The genesis of the Coronavirus, which rocked the nations of the world, is still a mystery. The process of how humans are infected is still not understood. The novel coronavirus is a highly contagious new virus that emerged in China's Wuhan late last year quickly spread to the rest of the world.

The coronavirus causes a respiratory disease called Covid-19. The disease, similar to flu, triggers symptoms like cough, fever, and in more severe cases, difficulty breathing. The doctors across the world have advised that people can protect themselves by frequently washing hands, not touching his/her face and avoiding physical contact with people.

India currently has a fatality rate of 1.18 per cent due to coronavirus. According to Ministry of Health and Family Welfare, Govt of India, more than 70 per cent of the people recover from Covid-19 with mild or very mild symptoms. Such cases may not even require admission to Covid-19 blocks or dedicated hospitals.

As per report, with more than 9,349 new corona virus cases till now, India now has registered a total of 4,49,24,811 Covid-19 infections across the country. This includes 20 new deaths which have taken the total count to 5,31,424. The total number of coronavirus cases also includes 4,43,35,977 people who have recovered and 57,410 who are currently being treated. There were 9,349 new active cases and 12,932 new recovered cases on Apr 27 2023.

According to the latest numbers, Maharashtra has the highest number of coronavirus cases at 81,63,626. Of this 1,53,741 are active, 80,09,885 are recovered and 1,48,508 have died. Kerala and Karnataka are next with 68,90,779 and 40,85,583 total COVID-19 cases respectively. Andaman and Nicobar Islands, Lakshadweep and Dadra and Nagar Haveli and Daman and Diu have the lowest number coronavirus cases with 10,766, 11,415 and 11,592 respectively.

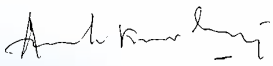
Across the world, there have been a total of 67,68,44,027 confirmed coronavirus cases, according to the latest update. This includes 62,56,25,456 people who are being treated, 4,43,35,977 who have recovered and 68,82,594 who have died. The highest number of coronavirus cases currently is in US which has registered 10,38,04,263 confirmed COVID-19 cases. 11,23,836 people have died of coronavirus in the country. India and France are next in line with 4,49,24,811 and 3,98,66,718 confirmed coronavirus cases and 5,31,424 and 1,66,176 deaths respectively.

The stressful circumstances of corona forced us to rethink again. A veritable roller coaster ride full of ups and downs. It has been tough and challenging, but equally unforgettable. Instead of worrying about what happened yesterday, the challenging conditions of Corona forced us to reflect more, think more, and be more ready to create a new tomorrow. We remained committed and moved forward with unflinching optimism and a rekindled vigour, staying dedicated with unwavering hope and doing what needed to be done while facing challenges is important.

We also kept India's flag flying high marching ahead in the face of adversity. Starting from scratch in vaccine manufacturing to the distribution of vaccines a lot of learning and unlearning had taken place. During those trying times and despite all the odds we have come out victorious. Again a fresh effort is still required to face this ongoing pandemic. We need to accept the new normal.

There is more such interesting and thought-provoking stuff to savour in this issue. So, happy reading!

Thanks and regards



Amresh K Tiwary,
Editor-in-Chief

GERIATRIC SPINE PROBLEMS

Attention must be given to each aspect and probable degenerative condition of aging in order to assist the aging population in this goal. Spine care in the aging spine and pain management are some areas where particular focus has to be given.....

BY DR H S CHHABRA

A report released by the United Nations Population Fund and Help Age India suggests that the number of elderly persons is expected to grow to 173 million by 2026. It is expected to lead to greater challenges for medical care in terms of care delivery, cost, and maintaining quality of life for aging individuals.

Orthopaedic surgeons shall face unique challenges in caring for this aging population. In particular, spine surgeons have to face the challenges of treating the growing numbers of patients with traumatic or insufficiency spine fractures as well as degenerative deformities and instabilities.The goal of the surgeon should be to enable the elderly to perform their usual activities of daily living independently or with minimal dependence on the family or care takers.

Significant degeneration of the spine begins in the third decade of life, eventually leading to progressive disc height loss and ligamentous/capsular hypertrophy, or thickening. As degeneration progresses, bony and soft tissue failure can develop, leading to a variety of spinal conditions.

What are the most common spine conditions affecting the elderly?

In older adults who have isolated low back and/or neck pain, more than half are due to degenerative facet joint arthritis.This is a type of osteoarthritis that affects the parallel column of joints that connect the individual vertebra of the spine behind the spinal canal(figure 1). Other common causes of back/neck pain are also largely a result of the aging process, with degenerative spine changes including spinal stenosis (narrowing of the central tube housing the spinal cord and spinal nerves), spondylolisthesis (misalignment of one vertebra over another), and/or neural foraminal stenosis (narrowing of the tunnels where the spinal nerves exit the spine). In spinal stenosis, the typical symptom is claudication in which the individual has pain in the leg which increases as the individual walks and ultimately needs to sit or lie down to relieve the pain. This distance gradually reduces with time and can issue major disability. Any or all of these conditions can cause pain, which may also radiate to the arms or legs due to irritation or compression of the spinal nerves.

Genetics and family history, obesity, smoking, certain occupations (excessive driving, lifting, or sitting in front of a computer), or a history of previous trauma are also reasons for the acceleration of the degenerative process.

There are other common causes of back pain in the elderly. Sudden, sharp back pain can be a result of a vertebral compression fracture, especially in those who have advanced osteoporosis.

Osteoporosis is a large problem for the growing population of older adults as it leads to decreased bone strength and, thus, bone fractures including spinal fractures. After reaching a peak between the ages of 16-25 years, bone mass slowly but continuously decreases at a rate of 0.5% per year in women and 0.3% per year in men. By the time they reach the age of 60, elderly men would have lost ~30% and elderly women ~50% of their total bone mineral density. It is estimated that as many as 61 million Indians have osteoporosis and approximately 80% of the urban Indian population is vitamin D deficient. Fractures can be the first sign of weak bones from osteoporosis. According to one report, vertebral fractures are present in about 25% of postmenopausal women, with rates increasing dramatically with age.

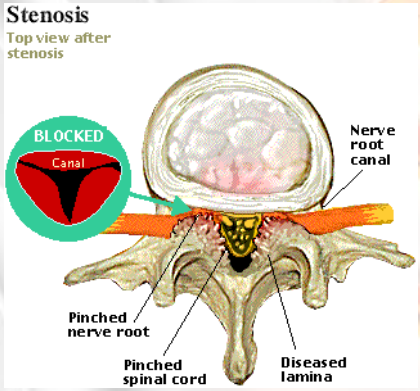
Another less common cause can be a spinal tumor, whether primary or metastatic. Infection, especially if the patient has recently had a spine procedure, is another possible condition that necessitates prompt diagnosis and treatment.

These conditions can be diagnosed and evaluated with x-rays and magnetic resonance imaging, and PET scan if required.

HOW CAN THESE CONDITIONS BE TREATED?

The treatment for degenerative changes of the spine leading to pain starts with lifestyle and ergonomic adjustments such as sleep positions, appropriate desk and chair height, and proper lifting technique. Then anti-inflammatory medications and physical therapy are utilized. Neurotropic medications may be required for claudication symptoms. The next steps include interventional pain management techniques, such as facet joint nerve blocks for facet arthritis or epidural steroid injections for sciatic-like pain.

The majority of patients will have tolerable pain after a series of these conservative treatments, but some may require surgery for relief. Most conditions can be treated with same-day, minimally invasive surgery, although some may require much more extensive surgery. Certain conditions, such as spinal stenosis or sciatic-like pain (radiculopathy), are more easily treated with surgery, while others, such as facet osteoarthritis, are not.



Vertebral compression fractures can most oftenbe treated conservatively. This involves management of the pain and management of osteoporosis. Osteoporosis management involves pharmacological management (generally oral or intravenous bisphosphonates or denosumab injection andteriparatide injections for severe osteoporosis), calcium supplementation, general conditioning exercises like walks and dietary/fall prevention counselling. If pain doesn't respond or if there are signs of spinal cord/nerve compression, surgery may be required. Kyphoplastyis a minimally invasive, same-day procedure where cement is injected into the fractured vertebral body, which, in almost all cases, relieves pain and stabilizes the bone from further collapse (avoiding the dangerous "hunchback" shape of the spine)(figure 3). In presence of instability or nerve/spinal cord deficit, stabilization with pedicle screws along with decompression by removal of pressure from nerves/spinal cord may be required. Is severe osteoporosis, cement augmentation may be required for stable pedicle screw fixation.

Spinal tumors, whether primary or metastatic, need to be evaluated by an oncologist as soon as they are detected. Standard interventional pain management techniques may help with the pain symptoms, but treatment using a complement of chemotherapy, radiation, and surgery will likely be recommended to address the tumors directly.

Infection of the spine, if not treated promptly, can lead to the obliteration of the spinal canal or nerves and/or septic shock. Fortunately, an extensive course of antibiotics and removal of spinal hardware (if applicable) are able to treat most infections.

The age of the patient is not a contraindication for spine surgery. The benefits of spine surgery for older patients, including less-invasive operations, outweigh the risks associated with those procedures where ever it is indicated. Also, spine surgery has seen rapid advancements in operative techniques, implants and biologics, and equipment such as

computer assisted navigation and surgical robotics increasing the safety and accuracy of surgery.

WHAT CONDITIONS CAN COMPLICATE THE TREATMENT?

Other conditions involving the spine can accelerate the development or complicate the treatment of these conditions. Some of these include ankylosing spondylitis, idiopathic scoliosis, rheumatoid arthritis, previous spine surgery, and cancer.

Medical conditions unrelated to the spine can also complicate treatment. Osteoporosis, for example, can cause or accelerate many of the above conditions, so proper treatment through a primary care provider or endocrinologist can help prevent progression of these conditions. Obesity also makes treatment of these conditions difficult, so proper dieting and appropriate exercise can help immensely. Smoking is well known to exacerbate all pain syndromes, so cessation is highly recommended.

HOW CAN WE REDUCE THE INCIDENCE OF SPINE CONDITIONS?

Ergonomics at home and work are extremely important and go a long way in helping to prevent or reduce back or neck aches. When sitting at a computer desk, avoid slouching of the back and stooping of the neck. Make efforts to raise the computer monitor to eye level and adjust seat height to facilitate optimal positioning. When lifting heavy objects, be sure to bend at the knees and not at the waist, and push rather than pull as much as possible.

Proper sleep bedding and positions are important as well.. A firm mattress and a pillow that allows your neck to lie in a neutral position are very important for neck and back stability. Also, sleeping with a pillow under the knees when lying supine or with a pillow between the knees when on the side can help reduce stress on the lower back.

Walking alone can improve flexibility, strength, and blood flow to the spine and intervertebral discs, which can help prevent injury. A morning or evening walk for 45 minutes can easily be incorporated into a daily routine, before or after meals. For those whose mobility is limited, staying out of bed as much as possible is the main priority.

A strong core is essential to preventing spine injury, so static exercises that strengthen and tone the abdominal, lower back, and neck muscles are also effective. Yoga and pilates (within reasonable limits) can also be helpful in creating and maintaining flexibility and strength of the spine and core.

Thanks to smart phones and mobile apps, our lives have become much easier. Mobile health is emerging as the most convenient way to deliver services remotely, and collect outcomes in real time, thus contributing to disease management by transferring care from hospital to home. Nowadays, there are mobile apps like Snapcare which are meant to help people with back pain and to teach them self-care of the back.

Globally, there have been rapid developments in prevention, diagnosis and comprehensive management of various spinal ailments in both medical and surgical fields. Prompt diagnoses such as vertebral fractures and infections can significantly reduce pain and even save lives. Older adults with sudden severe back pain and/or fever should be taken to urgent or emergent care as soon as possible. Timely intervention is crucial in better and efficient management of spine related conditions affecting the elderly.

To summarize, prevention is better than cure. Healthy lifestyle and spine care are necessary to escape the agony of spine problems. Early diagnosis and timely intervention is necessary to prevent complications in the management of spine conditions. With advancements in management of spine ailments, they can be successfully managed using medications, injections or surgery. Spine surgery is safe in the elderly and can give excellent results in expert hands.

(The author is Medical Director, Department of Spine Care, Sri Balaji Action Hospital, New Delhi)

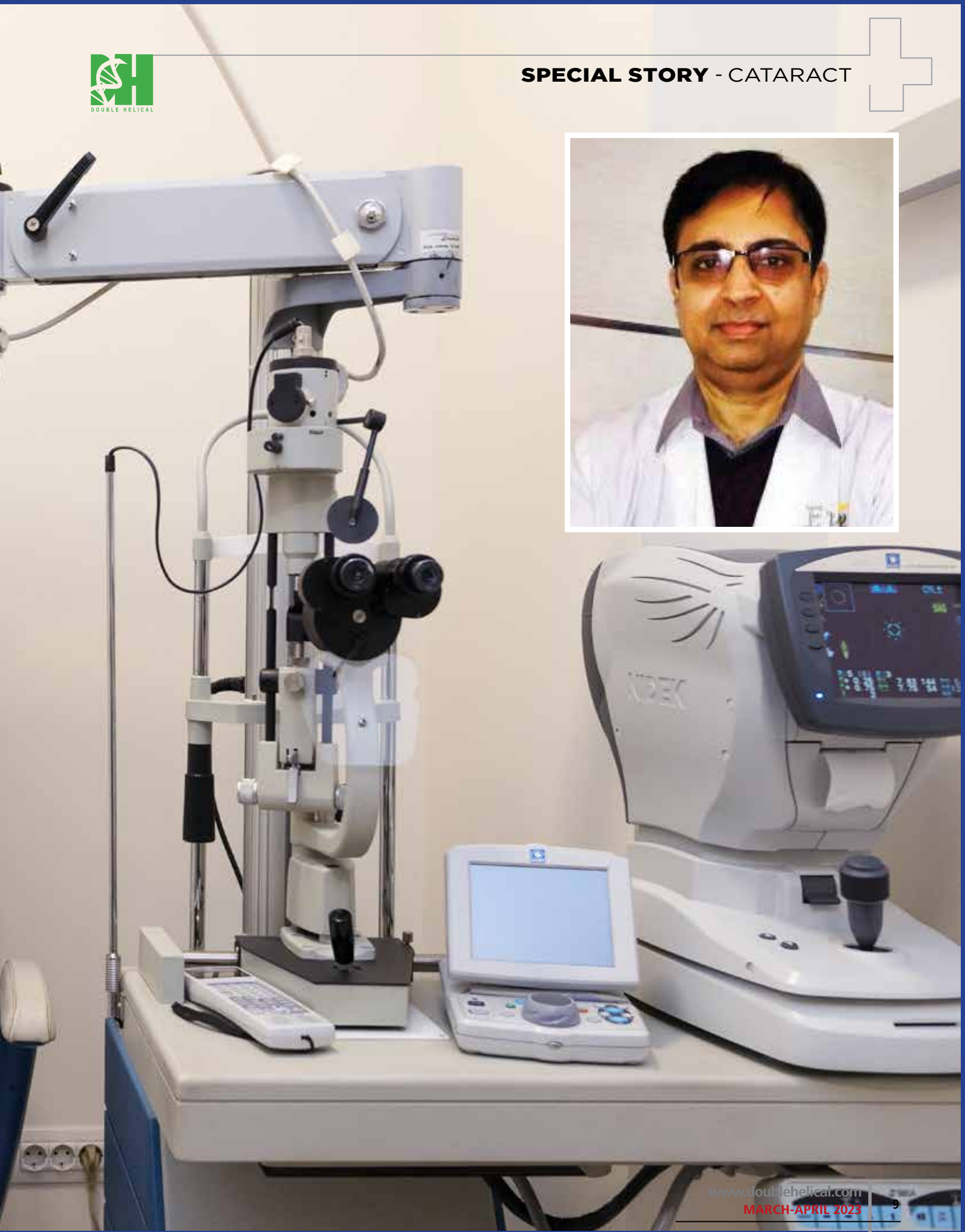
GET YOUR FOCUS RIGHT

Want to know what causes cataract; how it can be prevented; how is it detected; how it affects the vision, can problems develop after surgery; what are the latest surgical interventions to treat cataract? Read on …

BY DR RAJESH RANJAN

If you are experiencing symptoms like blurry vision, trouble seeing at night, fading of colours, increased sensitivity to glare, halos surrounding lights and double vision in the affected eye, you must immediately seek medical advice, as these are unmistakable signs ofcataract,

A cataract can occur in either or both eyes. It cannot spread from one eye to the other. It can interfere with daily activities and lead to blindness when left untreated. Although it may stop growing, it does not get smaller on its own.



Cataracts are common among people over 60 years old but can occur at any age. As people age, the inner lens of the eye becomes cloudy. This results in hazy vision, glare from lights and distortion of colour. The surgical removal of cataracts is a very common and highly effective procedure, and the standard treatment for cataracts. The cloudy natural lens is removed, and an artificial lens is implanted in the eye. After surgery, vision should be clear.

Cataract is a dense, cloudy area that forms in the lens of the eye. It begins when proteins in the eye form clumps that prevent the lens from sending clear images to the retina. The retina, as we know,works by converting the light that comes through the lens into signals. It sends the signals to the optic nerve."

There are several underlying causes of cataracts. These include an overproduction of oxidants, which are oxygen molecules that have been chemically altered due to normal daily life include smoking, ultraviolet radiation, the long-term use of steroids and other medications, certain diseases, such as diabetes, trauma and radiation therapy.

There are different types of cataracts. They are classified based on where and how they develop in your eye. Nuclear cataracts form in the middle of the lens and cause the nucleus, or the centre, to become yellow or brown.Cortical cataracts are wedge-shaped and form around the edges of the nucleus.Posterior capsular cataracts form faster than the other two types and affect the back of the lens.Congenital cataracts, which are present at birth or form during a baby's first year, are less common than age-related cataracts. Secondary cataracts are caused by disease or medications. Diseases that are linked with the development of cataracts include glaucoma and diabetes.

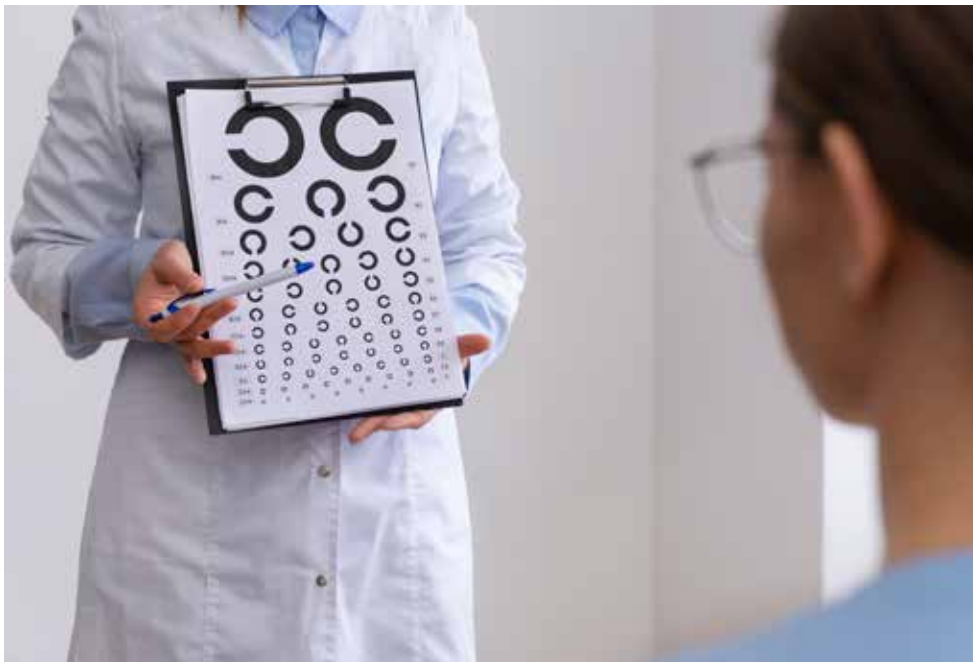
The use of the steroid prednisone and other medications can sometimes lead to cataracts. Traumatic cataracts develop after an injury to the eye, but it can take several years for this to happen.Radiation cataracts can form after a person undergoes radiation treatment for cancer.Risk factors associated with cataracts include: older age, heavy alcohol use, smoking, obesity, high blood pressure, previous eye injuries, a family history of cataracts, too much sun exposure, diabetes exposure to radiation from X-rays and cancer treatments."

The lens lies behind the iris and the pupil. It works much like a camera lens. It focuses light onto the retina at the back of the eye, where an image is recorded.

The most common tonometry test uses a painless puff of air to flatten your cornea and test your eye pressure. Your doctor will also put drops in your eyes to make your pupils bigger. This makes it easier to check the optic nerve and retina at the back of your eye for damage. Other tests your doctor might perform include checking your sensitivity to glare and your perception of colours.

The lens lies behind the iris and the pupil. It works much like a camera lens. It focuses light onto the retina at the back of the eye, where an image is recorded. The lens also adjusts the eye's focus, letting us see things clearly both up close and far away. The lens is made of mostly water and protein. The protein is arranged in a precise way that keeps the lens clear and lets light pass through it.

"But as we age, some of the protein may clump together and start to cloud a small area of the lens. This is a cataract. Over time, the cataract may grow larger and cloud more of the lens, making it harder to see. Still the researchers suspect that there are several causes of cataract, such as smoking and diabetes. Or, it may be



that the protein in the lens just changes from the wear and tear it takes over the years.

TREATMENT OF CATARACT

To treat Cataract we usually suggest stronger eyeglasses, magnifying lenses, or sunglasses with an anti-glare coating.Surgery is recommended when cataracts prevent you from going about your daily activities, such as reading or driving. It's also performed when cataracts interfere with the treatment of other eye problems.One surgical method, known as phacoemulsification, involves the use of ultrasound waves to break the lens apart and remove the pieces. Extra capsular surgery involves removing the cloudy part of the lens through a long incision in the cornea."

After surgery, an artificial intraocular lens is placed where the natural lens was. Surgery to remove a cataract is generally very safe and has a high success rate. Most people can go home the same day as their surgery.

The symptoms of early cataract may be improved with new eyeglasses, brighter lighting, anti-glare sunglasses, or magnifying lenses. If these measures do not help, surgery is the only effective treatment. Surgery involves removing the cloudy lens and replacing it with an artificial lens.

HOW DOES CATARACT AFFECT VISION?

Age-related cataracts can affect vision in two ways:Clumps of protein reduce the sharpness of the image reaching the retina. The lens consists mostly of water and protein. When the protein clumps up, it clouds the lens and reduces the light that reaches the retina. The clouding may become severe enough to cause blurred vision. Most age-related cataracts develop from protein clumping. When a cataract is small, the cloudiness affects only a small part of the lens. You may not notice any changes in your vision. Cataracts tend to "grow" slowly, so vision gets worse gradually.

Over time, the cloudy area in the lens may get larger, and the cataract may increase in size. Seeing may become more difficult. Your vision may get duller or blurrier.The clear lens slowly changes to a yellowish/brownish colour, adding a brownish tint to vision. As the clear lens slowly colours with age, your vision gradually may acquire a brownish shade. At first, the amount of tinting may be small and may not cause a vision problem.

Over time, increased tinting may make it more difficult to read and perform other routine activities. This gradual change in the amount of tinting does not affect the sharpness of the image transmitted to the retina. If you have advanced lens discolouration, you may not be able to identify blues and purples. You may be wearing what you believe to be a pair of black socks, only to find out from friends that you are wearing purple socks.

CAN PROBLEMS DEVELOP AFTER SURGERY?

The problems after surgery are rare, but they can occur. These problems can include infection, bleeding, inflammation (pain, redness, and swelling), and loss of vision, double vision, and high or low eye pressure. With prompt medical attention, these problems can usually be treated successfully.

Sometimes the eye tissue that encloses the IOL becomes cloudy and may blur your vision. This condition is called an after-cataract. An after-cataract can develop months or years after cataract surgery.

An after-cataract is treated with a laser. We use a laser to make a tiny hole in the eye tissue behind the lens to let light pass through. This outpatient procedure is called a YAG laser capsulotomy. It is painless and rarely results in increased eye pressure or other eye problems. As a precaution, your doctor may give you eye drops to lower your eye pressure before or after the procedure.

(The author is Senior Eye Surgeon, Eye 7 Hospital, Indirapuram, Ghaziabad)

CLIMATE CHANGE ADAPTATION

The concepts of ecosystem services and nature-based solutions are new approaches that recognise the dependence of human societies and their developments on natural systems.....

BY DR. NIDHI YADAV/SUDIKSHA GUPTA

Adapted from the Fourth National Climate Assessment (2018)

It is however expected that they can broaden the focus regarding the fundamental human relationship with the nature and create multiple benefits including climate change adaptation. In the same lines sustainable urban development requires an understanding of the management of NBS (nature-based solutions) that is nature-based solutions for CCA (Climate Change Adaptation) and their mainstreaming or integration into urban planning and governance.

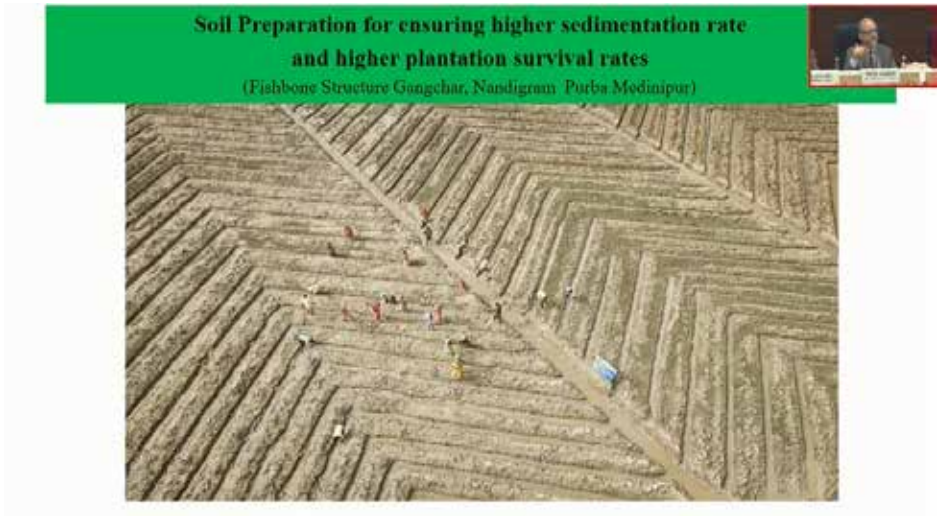
This work has to be accomplished

at several levels like municipal level where international and national legislation and policies are translated into practice. The key focus area for this purpose should include assessment of naturally vulnerable areas and promotion of ecosystem-based adaptations. The ways to minimize risk at the lowest costs should be brainstormed so that these adaptations do not turn into maladaptation over time and the need for mainstreaming adaptation into the developmental strategy. Talking about the feasibility of climate change adaptation for disaster risk reduction, there can be 5 major types of nature-based solutions viz ecosystem restoration approaches, issue-specific ecosystem-related approaches, infrastructure-related approaches, ecosystem-based management approaches, and ecosystem protection approaches.

A few interesting examples supporting his argument include the Bio shield of Bengal, an innovative approach started by Government of West Bengal. In this approach a nature-based solution was introduced to prevent the harmful effect of the flood pertaining to coastal region and the adjacent areas of West Bengal using mangrove plantation technique under the name of MISHTI (Mangrove Initiative for Shoreline habitats and tangible incomes). The mangroves planted here have come to be known as "Bio-Shield of Bengal."

Under CBEMR (Community-Based Ecological Mangrove Restoration), around 20 crore propagules of mangroves have been planted by females covered under MNREGA. Hence, creating employment opportunities in the remote areas at a time where unemployment is a grave issue of concern.

It is now growing into a people's movement- females tied rakhis to



these trees and termed them as "protectors", and schools were encouraged to involve students and send Valentine's Day messages to the trees. The shock-absorbing nature of mangrove trees would prove to be of great significance in reducing the risk of disasters in the upcoming years.

Mangroves have a complex salt filtration system and a complex root system to cope with saltwater immersion and wave action. They are adapted to the low-oxygen conditions of waterlogged mud but are most likely to thrive in the upper half of the intertidal zone. Compared to other type of forests, mangroves have extremely high rate of carbon capture, a service which benefits society as a whole. Also, it is beneficial in carbon sequestration and could turn out to be golden step towards reducing the greenhouse gases and the associated rise in temperature of the planet Earth. Given the financial aspects, it is so far, the most pocket friendly way to address a climatic issue pertaining to floods and cyclones. Bio-shield workers are given wages to be a part of it and working towards nature restoration.

This bio-shield project is a step towards sustainable future with a

> **"the adjacent areas of West Bengal using mangrove plantation technique under the name of MISHTI (Mangrove Initiative for Shoreline habitats and tangible incomes). The mangroves planted here have come to be known as "Bio-Shield of Bengal."**

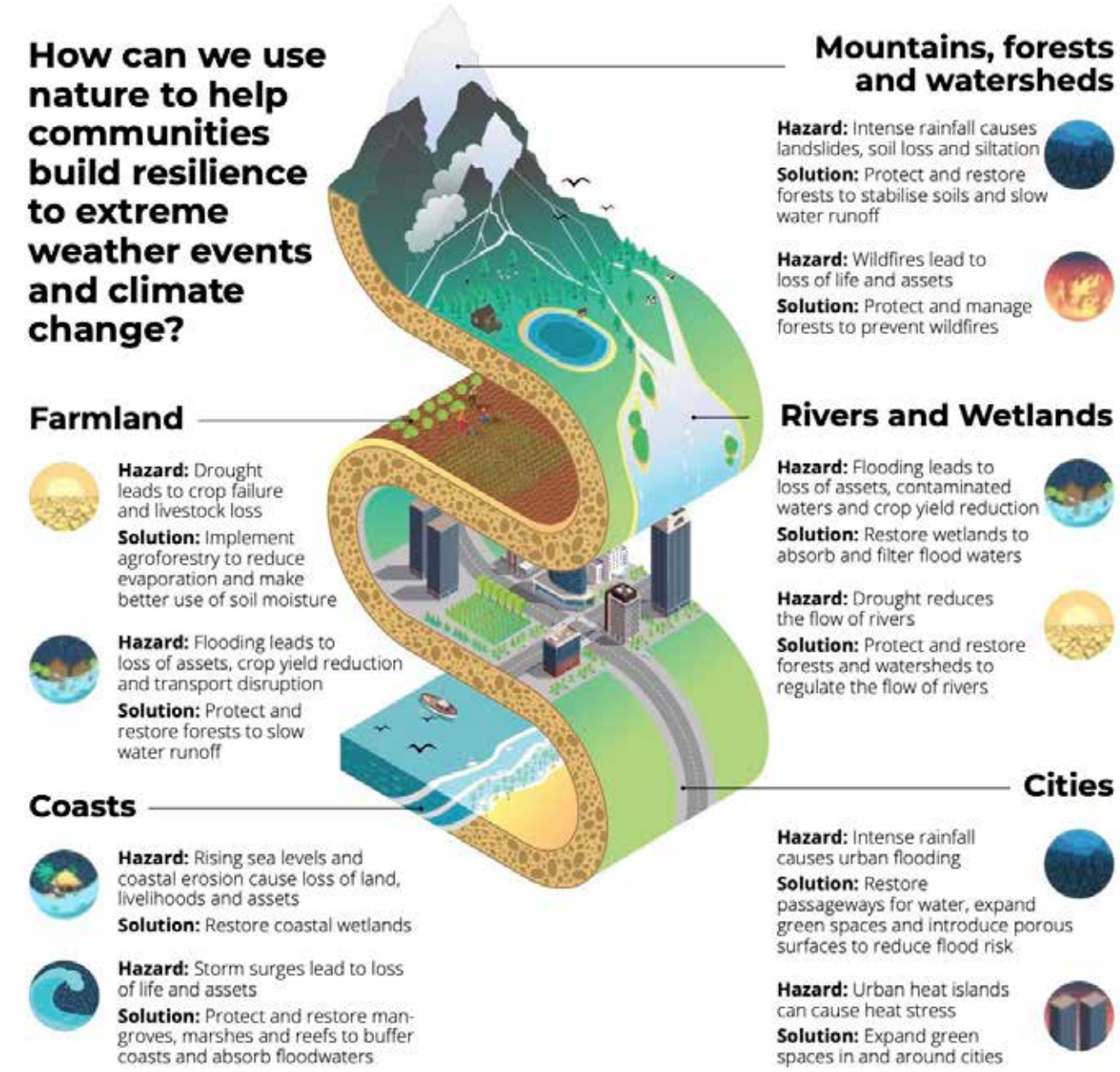
promise of less to no harmful effects of the super cyclones. Another well known and practiced approach is Wetland restoration. It is also a nature-based solution which is highly sustainable to tackle environmental challenges. Environmentalists like Ramveer Tanwar, the CEO of Say Earth has worked on the restoration of ponds in various Indian cities and the total revamping of the surrounding areas into tourist spots. Several industries and multiple disciplines of science need to come together and collaborate to make these solutions work including research to construction and capacity building in terms of skills and infrastructure.

Local level initiatives like "Jal Chaupal" should be welcomed, in which the problem and solutions are discussed with the native residents with the belief that they experience everything first-hand.If we compare nature-based solutions to a doctor's toolkit; there are various tools with different uses available with different sets of problems that it can cater to.

Nature-based solutions can be implemented at different levels, from small-scale community projects to large-scale national initiatives.

Nature-based solutions will not only increase jobs, growth, and sustainability, but it also has the potential to become an investment rather than a cost. This claim can be supported by statistical fact that by investing a dollar in wetlands, we can save seven dollars in avoided damages.

Nature-based solutions can be implemented at different levels, from small-scale community projects to



Source: Adapted from Global Commission on Adaptation, Adapt Now report, 2019

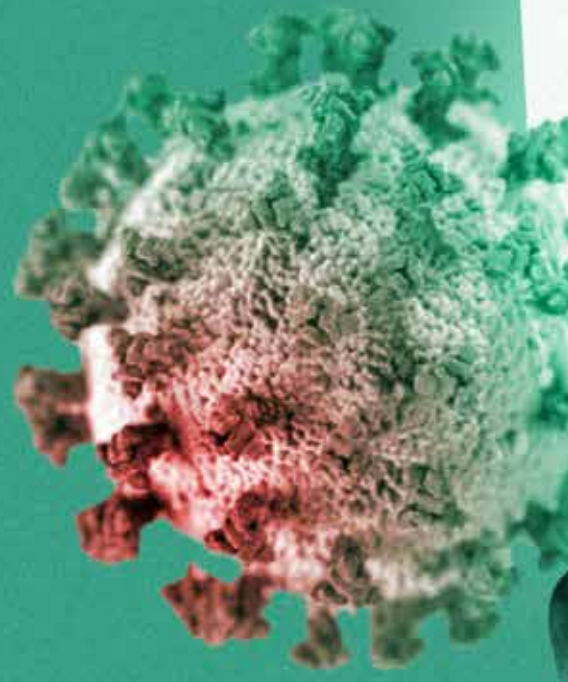
large-scale national initiatives. At the community level, nature-based solutions can involve things like community gardens, green roofs, and rainwater harvesting systems. These features can help to improve local air and water quality, reduce the risk of floods, and provide opportunities for community members to connect with nature. At the national level, nature-based solutions can involve policies and programs aimed at protecting and restoring natural areas.The Govt. should take strong and fast actions for the restoration of wetlands before irreversible damage is done. The basic idea remains working with nature, rather than against it, to address modern day issues of global warming and climate change that leads to natural disasters and biodiversity loss. Such nature-based solutions pave the way for healthy life style

(The authors are from IIHMR, New Delhi)

AN ILLEGITIMATE CHILD: PARENT UNKNOWN?

There is still ambiguity over origin of SARS-CoV-2. Now some experts claim as SARS-CoV-2 is like an illegitimate child whose parent is unknown.....

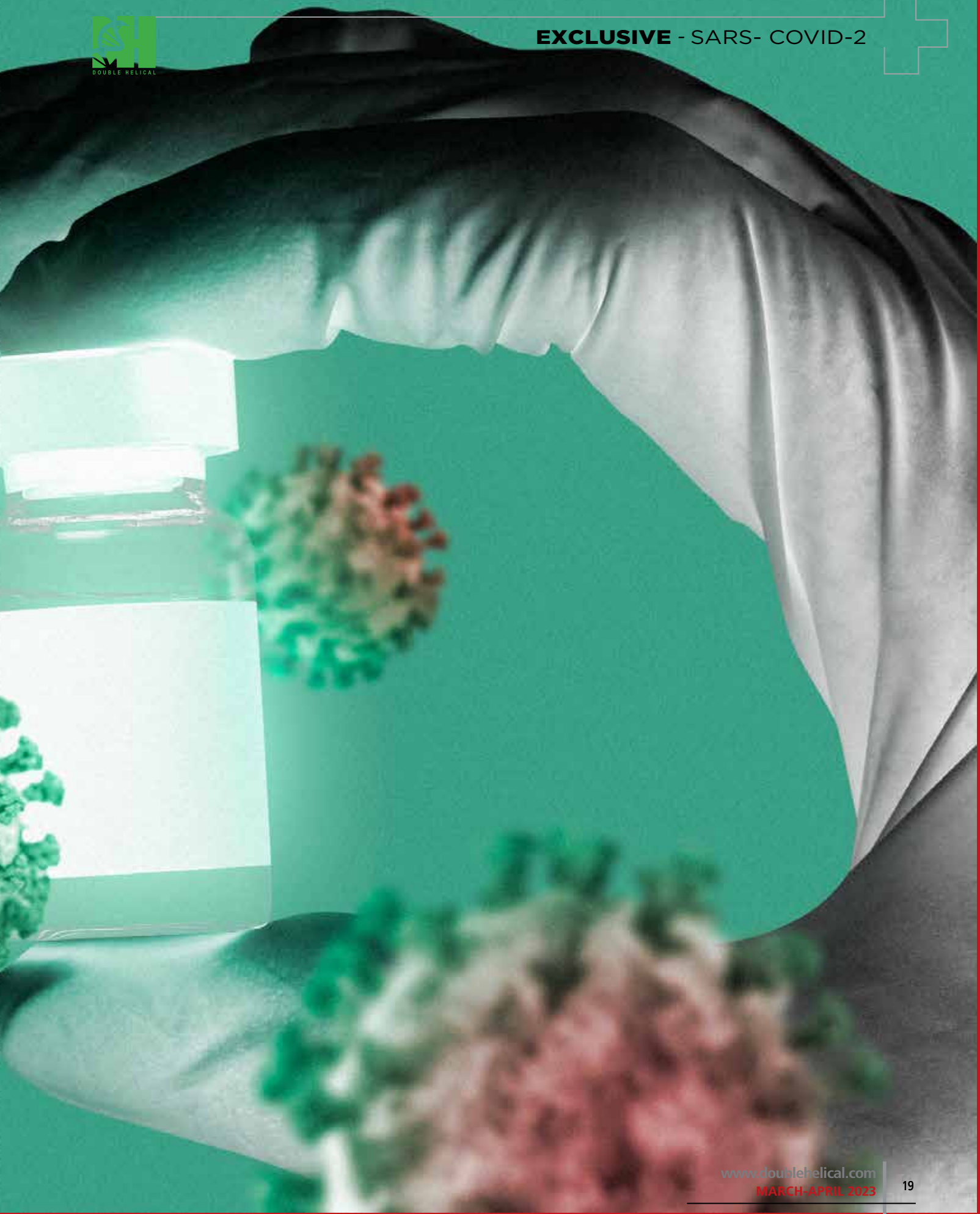
BY DR AMITAV BANERJEE



As per report, early in the Covid-19 pandemic, SARS-CoV-2 was of laboratory origin. They noted four unique insertions in the spike protein of the virus responsible for the most disruptive pandemic in the history of public health. The insertions made the virus more efficient in attaching to human cells and therefore more transmissible. This is one of the strategies of "gain of function research."

The researchers from Indian Institute of Technology Delhi (IIT, Delhi), and Acharya Narendra Dev College, found their findings in a pre-print to share their astounding results with the wider research community. However, the impact was not what they expected. The high priest of Covid-19, Anthony Fauci, described the research and its conclusions "outlandish!" Taking cue from the influential medical dictator of his times many top scientists strongly criticized the paper. Finding no support from the scientific community, the Indian researchers were forced to withdraw the paper.

WHAT IS GAIN OF FUNCTION



RESEARCH?

Gain of function research (GOFR) refers to attempts to enhance the function of a naturally occurring pathogen so that it becomes more transmissible or more virulent. The method to this madness is twofold – to be one step ahead of nature in case the naturally occurring virus or pathogen mutates naturally to a more virulent strain, so as to prepare vaccine or drugs in advance, and secondly, to be ahead of a hypothetical enemy working on bio-weapons.

Gain of function research originated from controversial experiments undertaken in USA around 2011, involving mutated version of the H5N1 avian influenza virus in which ferrets were infected with the virus. The naturally occurring strains of H5N1 while very lethal with 60% fatality had very poor transmission ability among humans. Researchers in anticipation of an unfortunate natural mutation to a more transmissible variant started working on GOFR with the H5N1 and made it highly transmissible by the airborne route among ferrets. They were also found to be sensitive to some antiviral drugs. When these researchers attempted to publish their findings, the United States Science Advisory Board for Bio-Security, an advisory committee to the US National Institute of Health (NIH), did not give permission. This was due to the apprehension that groups hostile to American interests may use the findings to develop their own biological weapons. An international group of influenza researchers in 2012 announced a pause to GOFR with the viruses which would enhance transmission among mammals. This pause lasted for eight months. In the interim, the issue was discussed at various forums including the WHO, in media and scientific journals.

Several months later the research teams which conducted the gain of function research were permitted to publish their findings in Nature and Science.

While proponents of the GOFR justify it on grounds that it can enable better preparedness in case of natural mutations of pathogens to highly virulent forms, others discourage it on the grounds of it being hazardous in case of accidents like lab leaks.

THE PLOT THICKENS – WAS SARS-COV-2 ORIGINS A RESULT OF GOFR GONE ASTRAY?

While all along, any speculation about attributing the origins of SARS-CoV-2 to a lab leak were quashed by main stream media and scientific journals and dismissed as "conspiracy theory," recent disclosures have swung the needle of suspicion back from the forest towards the lab.

The former Head of the Centers for Disease Control, USA, Dr Robert Redfield, a virologist himself, mentioned that he was "sidelined" due to his views on the origins of the SARS-CoV-2. He was the key witness in a public hearing on the origins of the novel coronavirus. He expressed that he was excluded from discussions on the subject by Anthony Fauci and

his team, because he suspected a laboratory leak. The accusation was vehemently denied by Fauci.

Many scientists still insist that there is no possibility that the virus originated in a laboratory. The White House, as usual is non-committal. It says there is no consensus among US government scientists and officials about the origins of the virus.

Proponents of natural source put forth the hypothesis that the virus originated from the wet sea food and wildlife markets in Wuhan. Incidentally, or rather conveniently, the market is near the Wuhan Institute of Virology that was conducting research on coronaviruses.

Dr Redfield, however, persists that the virus originated in the lab as it is not scientifically plausible that it evolved naturally from animal source. He was leading the CDC when the pandemic was declared in 2020. He claims that he was kept in the dark since the beginning of the pandemic and excluded from meetings as his views did not find favour with Fauci, the de facto head of the Covid-19 pandemic response. Dr Redfield said that he was informed that there should be a single narrative and his views did not fit in that narrative. He lamented that debate, so essential in science, was squashed.

Dr Redfield also expressed that he

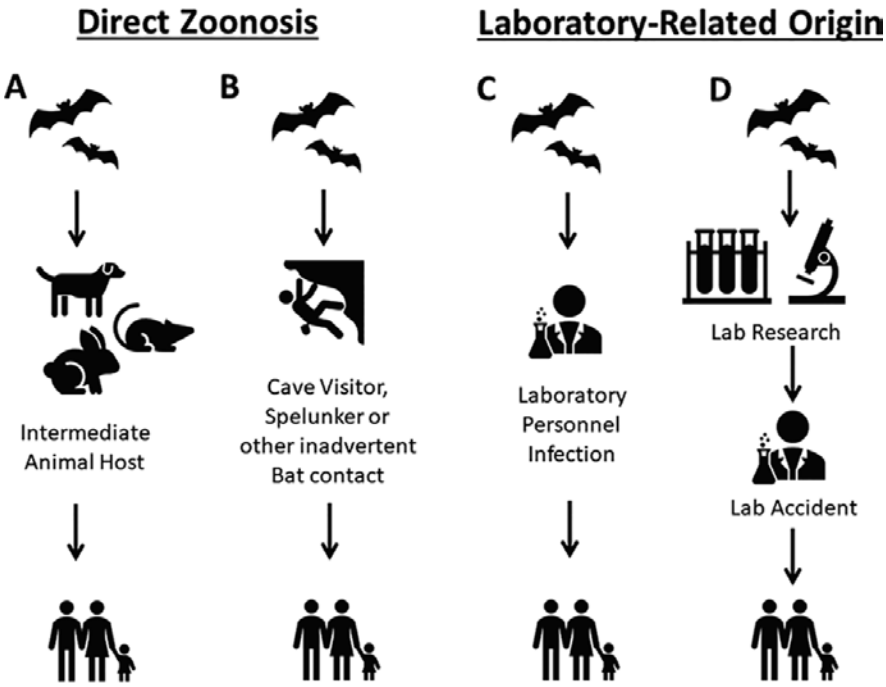
Dr Redfield, however, persists that the virus originated in the lab as it is not scientifically plausible that it evolved naturally from animal source. He was leading the CDC when the pandemic was declared in 2020.

was opposed to gain of function research. He suspected that this research was being funded at the Wuhan lab by US agencies.

The public hearing in the USA came shortly after the FBI announced that a lab leak was "most likely." Before that the US Department of Energy issued a statement saying that the virus was most likely a result of lab leak in Wuhan but could only reach to this conclusion with "low confidence," whatever that means.

THE NEEDLE OF SUSPICION SWINGS BACK TOWARDS ANIMALS

Just when it was appearing that the mystery of the origins of the virus was resolving, the WHO has muddied the waters once again. It has accused China of hiding data that would establish the animal origins of the virus. There is speculation that the pandemic originated when illegally traded racoon dogs infected humans at the wet sea market in Wuhan. The gene sequences were removed from the scientific database. These data



should have been shared three years ago, said Tedros, the WHO Director General.

Doubts remain about the collection of samples, what they contained, and why they disappeared. Ambiguities persist and it is difficult to come to any firm conclusions based on propositions. The new genetic data do not establish beyond doubt that racoon dogs were infected with the coronavirus. Even if they had been the possibility remains that some infected persons may have passed the virus to the racoon dogs, the coronaviruses being promiscuous viruses capable of infecting many species.

CONCLUSION – "TALASH" CONTINUES...

In the absence of the actual animal that first spread the virus to people (the nearest bat cave is hundreds of miles away from Wuhan), trying to search for the origins of the virus

> **"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**

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 took samples in early 2020. Failure to find the virus circulating in animals around Wuhan is the weakest link in the hypothesis of natural origins. For a long time to come, it appears, SARS-CoV-2 would remain an illegitimate child – parent unknown.

(The author is a post doctoral in epidemiology who was a field epidemiologist for over two decades in the Indian Armed Forces. He also led the mobile epidemic investigation team at the Armed Forces Medical College, Pune, India from 2000 to 2004. During this period he investigated a number of outbreaks in different parts of the country. He was awarded for his work on Tribal Malaria and Viral Hepatitis E. He presently is a Professor in a Medical College in Pune.)

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RECOVER YOUR HEAR LOSS

People with a cochlear implant cannot undergo MRI as it may dislodge the implant or demagnetize its internal magnet. In cases of dire need of an MRI, the magnet from the internal part may be removed surgically.....

BY DR RAVI MEHER

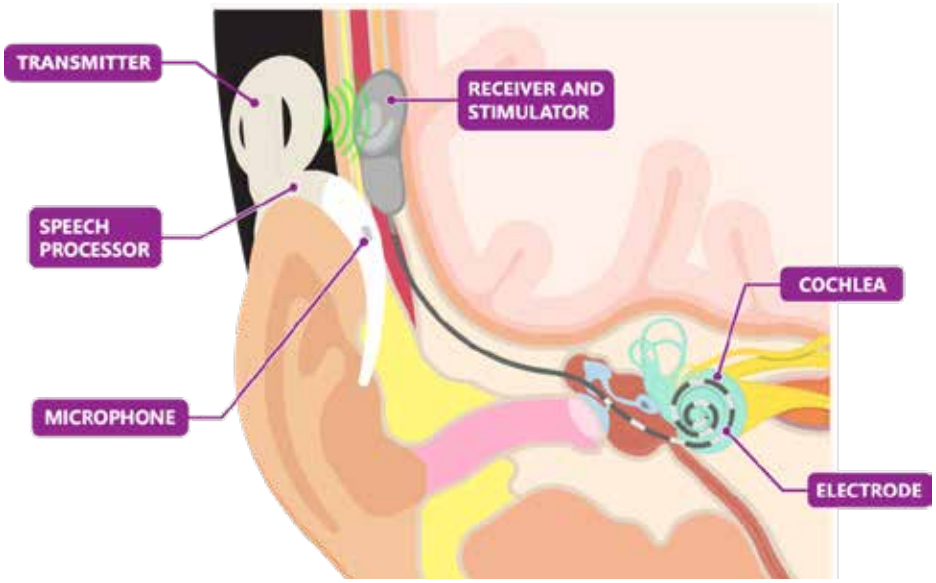
The cochlear implant surgical procedure is done in the hospital setting under general anaesthesia. The procedure usually takes 2.5 to 3 hours.

The surgeon performing cochlear implant surgery must be experienced in ear surgery and ideally in some aspects of neurotologic surgery. Intimate knowledge of the relevant surgical anatomy of the middle and the inner ear is important in properly performing the approach to the cochlea where in the electrodes are inserted. In addition, the relationship of the facial nerve, ear bones and inner ear needs to be understood properly to safely perform the surgical drilling to gain access to the middle ear. Once the middle ear has been opened, knowledge of the inner ear structures and the round window anatomy is vital. Variations in anatomy, ossification of the inner ear, facial nerve must be anticipated. These variations make surgery even more difficult.

The surgical procedure is done under microscopic control and strict sterile conditions are maintained. An S shaped Incision is made behind the ear and bone (mastoid) is exposed anteriorly till the level of the ear canal and posteriorly to allow for insertion and securing of the implant's receiver. The mastoid bone is drilled and the air cells in the bone are opened. The external ear canal and ear drum are not disturbed during the procedure. A mastoid cavity (mastoidectomy) is created by drilling the surrounding mastoid air cells. Through this cavity, a small opening is made in the posterior ear canal wall to reach the middle ear. It is a critical step because facial nerve is very close and can be injured during drilling at this step. The middle ear structures are then visualised under high magnification and another opening is made in the inner ear near the round window. This opening which opens the basal turn of cochlea is called cochleostomy, through which the implant electrode is inserted. Next, bone behind the mastoid cavity is drilled to make a well for the internal magnet receiver of the implant. The receiver is then fixed in the well and secured by sutures. The functioning of the all the electrodes is confirmed by doing neural telemetry intraoperatively. This confirms the functional status and right positioning of all the electrodes. The wound is then closed in layers and an aseptic dressing is applied. Patient is kept on antibiotics and analgesics for around 7 days. Once the wound heals the external device is put and switched on usually after 3 weeks of the surgery.

COMPLICATIONS

As with any surgical procedure, cochlear implant surgery may also have complications. These can be anaesthesia related which are because of drugs and anaesthetic gases. For



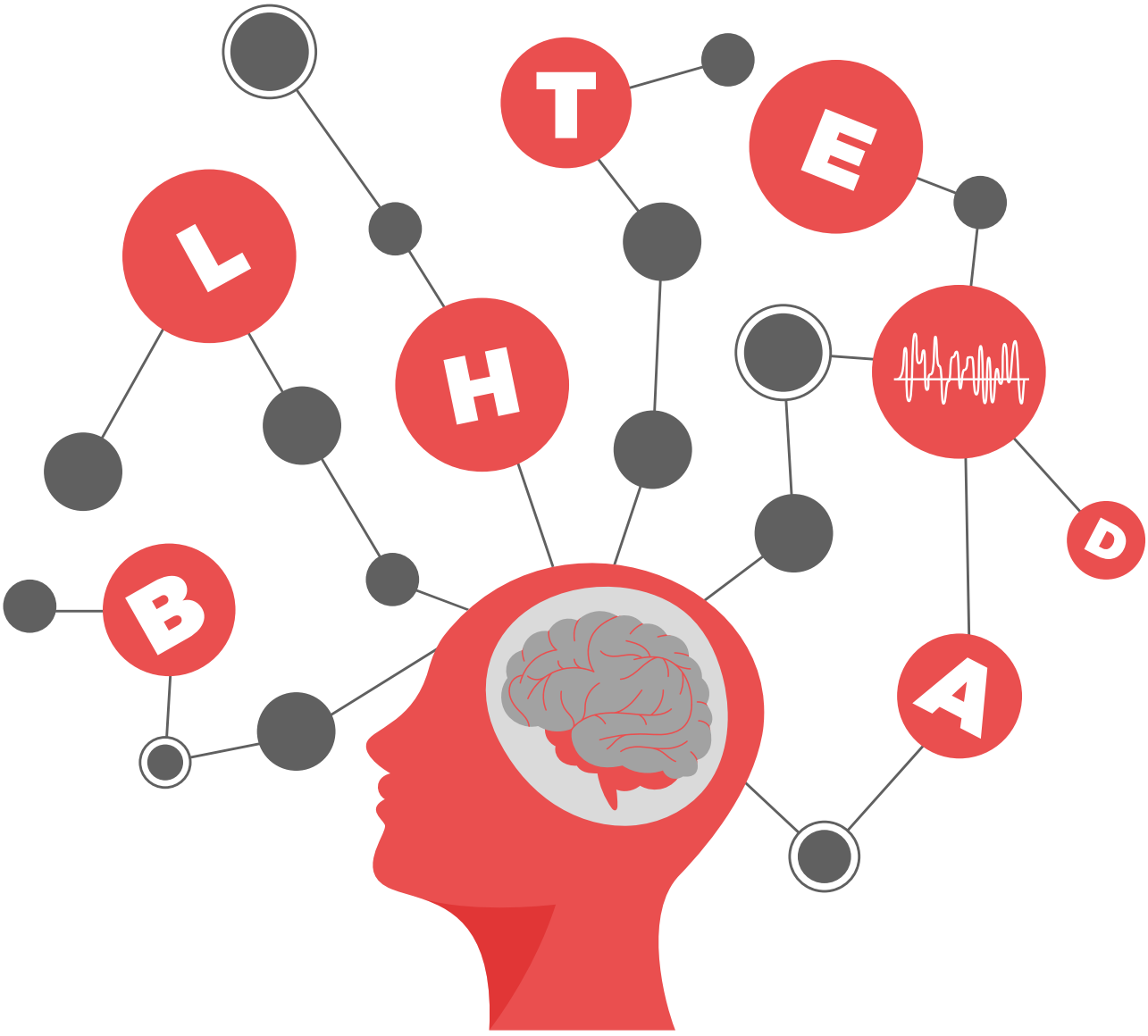
most people, the risk of general anaesthesia is very low. However, for some with certain medical conditions, anaesthesia can be more risky.

Surgical risk can be injury to the facial nerve. This nerve goes through the middle ear to give movement to the muscles of the face. It lies close to where the surgeon needs to place the implant, and thus it can be injured during the surgery. An injury can cause a temporary or permanent weakening or full paralysis of the face on the same side as of implant. Another complication is meningitis which is infection of the covering of the brain. Patients who have inner ear abnormality are at greater risk. Thirdly, there may be fluid leakage from a hole created in the inner ear to place the implant and is more commonly seen in patients with inner ear abnormality. Infection of the skin wound and blood or fluid collection at the site of surgery can occur and may require drainage of the collected blood and fluid with antibiotics. Also, severe infection at the site of implant can sometimes lead to extrusion or rejection of the implant. Some patients may suffer from attacks of dizziness or vertigo and tinnitus, the latter is ringing or buzzing sound in the ear. This usually settles with time. The nerve that gives taste sensation to the tongue also goes through the middle ear and may be injured during the surgery.

People with a cochlear implant cannot undergo MRI as it may dislodge the implant or demagnetize its internal magnet. In cases of dire need of an MRI, the magnet from the internal part may be removed surgically. The magnet in these implants are rotable and it gets aligned with the magnetic field and there is no need to remove the magnet. There are certain implants which are compatible with 3 Tesla MRI. The external as well as internal part of implant may get damaged with contact sports, automobile accidents, slips and falls, or other impacts near the ear. The implant may have to be removed temporarily or permanently if an infection develops after the implant surgery or there is implant failure.

The patient may develop irritation where the external part rubs on the skin and hence may necessitate temporary removal. The external parts of the implant may get damaged if it gets wet. Thus, the implantee would need to remove the external parts of the device while bathing, showering, swimming or participating in water sports. However, accessories are available which can be used to encase the implant while swimming.

(The author is Director Professor, Department of ENT & Head Neck Surgery, Maulana Azad Medical College, New Delhi)



POST OPERATIVELY SPEECH AND HEARING REHABILITATION

BY SANJEEV KUMAR

This is the most important part of cochlear implant programme. The success of the implant depends on good speech hearing rehabilitation. The implanted child needs to understand the auditory signals perceived by his brain to comprehend the speech and communicate using acquired speech and language abilities.

SWITCH ON

Swit ix weeks of your operation, the audiologist will fit the external speech processor and switch on the device. He will also connect it to the computer adjust the settings on your device. So as the device is switched on, the speech processor will start sending signals to the electrodes in the cochlea for the first time. After this the speech processor's microphone is activated and the patient will hear for the first time and it is usually like buzzing sound or mechanical sounds.

"The computer can thus make changes in the input to the electrodes array that is implanted into the cochlea"

MAPPING

Mapping or Mapping is the term used for programming a cochlear implant according to the needs of its user.

These programs actually stimulate the electrodes of the implant and there by determine the exact amount of signal (electric activity) required for the patient to optimize the cochlear implant to any sound. The computer can thus make changes in the input to the electrodes array that is implanted into the cochlea. This is done by connecting the cochlear implant processor to a computer. By giving series of acoustic signals in form "beeps" and measuring the patient response, the audiologist

MAPPING OF COCHLEAR IMPLANT

adjusts the T- and C- levels for each electrode. T-Levels, or Thresholds, are the softest sounds the cochlear implant users can detect while C-Levels are Comfortable loudness levels that are tolerable for the implant users. The audiologist also adjust the stimulation rate or programming strategy that is used to translate acoustic sound into the correct combination of electrode stimulations to give the cochlear implant user the same sensation of sound which a normal person would have.

SPEECH AND HEARING REHABILITATION SESSIONS

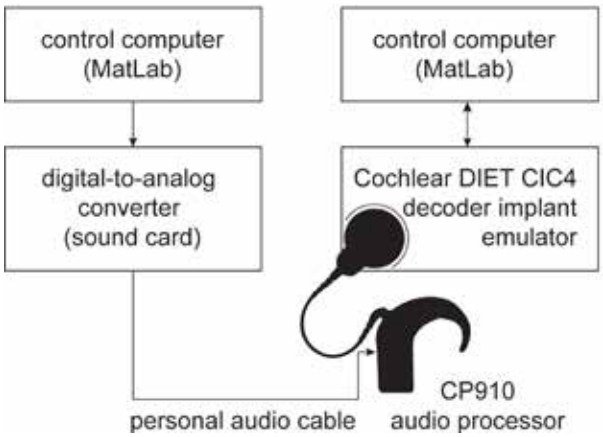
After your implant is 'switched on' the patient usually takes few weeks to get used to hearing with the implant.

The audiologists will keep on making adjustments to the computer settings as per the requirement and the performance of the child.

Along with this implanted child will receive lessons from a Speech & Hearing Therapist who will help in identifying different sounds and distinguish vowels and consonants. Rehabilitation is important stage of cochlear implant where the patient learns to make meaningful response to various sound stimuli coming to the brain. Speech therapy is an important

"Speech therapy is an important part of rehabilitation process where the child learns about oro-motor control to produce meaningful words and sentences"

A



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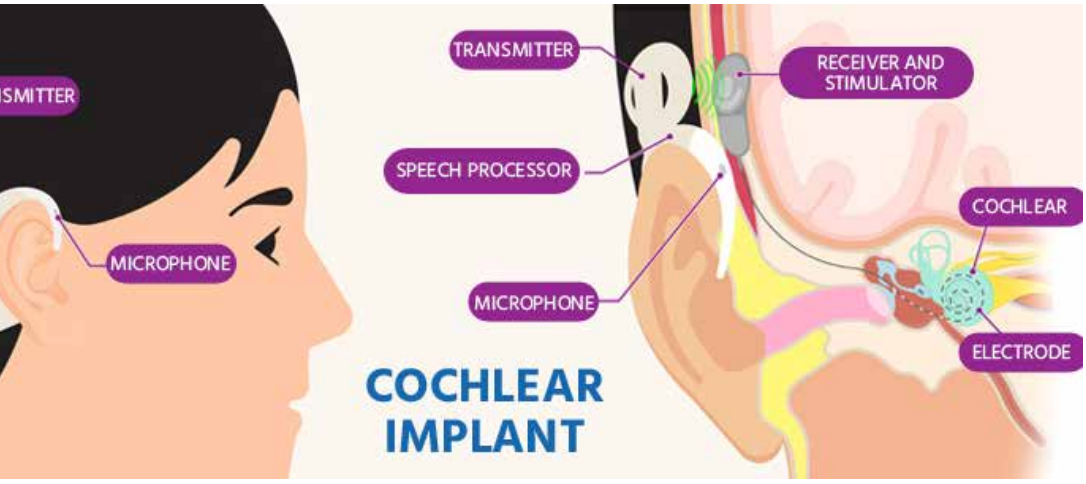


part of rehabilitation process where the child learns about oro-motor control to produce meaningful words and sentences.

The training is usually longer and more complicated in the case of children who are born deaf. While recently deafened adults generally adapt faster to the use of their implant.

(The author is Audiologist, Cochlear Implant Program, Lok Nayak Hospital, New Delhi)

CANDIDACY CRITERIA & INVESTIGATIONS

For children aged 12-23 months, profound hearing loss, that is, PTA for both ears equalling or exceeding 90 dB is the criteria. Individuals older than 24 months are permitted cochlear implantation.....

BY DR DIVYA GUPTA

The improvement in performance outcomes of Cochlear Implant because of the advent of advances in the implant technology and improvement in surgical techniques is leading towards a gradual change in cochlear candidacy criteria, broadening their usage. Largely, it depends on the feasibility of surgical implantation, weighing the benefits of an implant over hearing aid or no prosthesis at all for an individual and availability of a supportive family and psychological, educational and rehabilitative situation to keep a cochlear implant working.

AUDIOLOGICAL EVALUATION

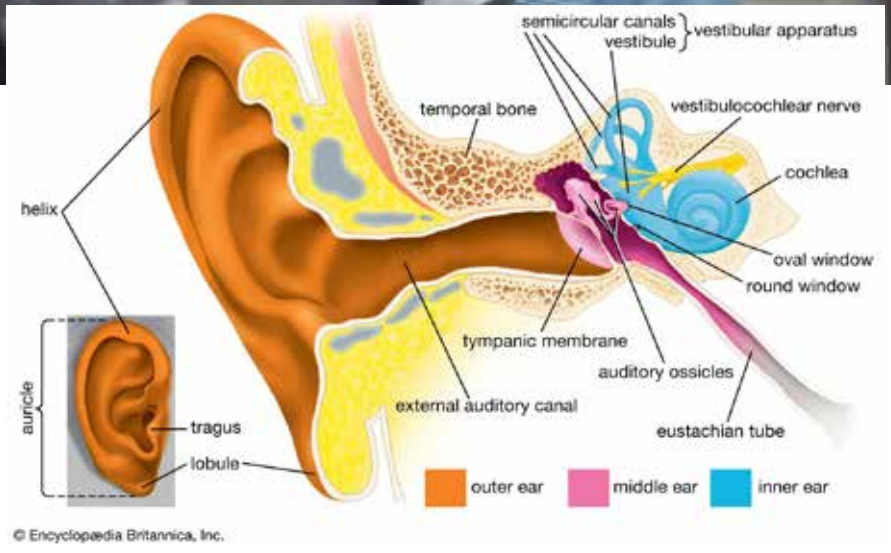
For both adults and children, certain hearing and speech tests are done to screen likely candidates. Pure Tone Audiometry (PTA), Brainstem Evoked Response Audiometry (BERA) and Auditory Steady State Response (ASSR) are the tests for hearing evaluation which determine the hearing thresholds. Whereas PTA depends on active cooperation of the subject, thereby only proving utility in people more than 5 years of age, both BERA and ASSR are objective tests which can reliably assess hearing status even in a newborn. For children aged 12-23 months, profound hearing loss, that is, PTA for both ears equalling or exceeding 90 dB is the criteria. Individuals older than 24 months are permitted cochlear implantation when they have severe to profound deafness (cut off PTA threshold value of 70 dB). In either case, the candidate should be fitted with a hearing aid at least for three months prior to the procedure and the benefits should be weighed.

Whenever possible, outcomes from word and sentence recognition testing are also used to determine candidacy. Current guidelines permit implantation in adults with approximately 50-60% words correct on open-set sentence recognition tests.

BERA TEST BEING DONE

RADIOLOGICAL EVALUATION

Imaging with High resolution Computed Tomography of temporal bone (CT) and Magnetic Resonance Imaging (MRI) form an indispensable part prior to implantation procedure. They are used to evaluate the temporal bone anatomy of an individual, viz, the inner ear



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where electrodes are finally inserted, facial nerve which may be accidentally injured during the surgery, cochleovestibular nerve, brain and brainstem. The latter three are best assessed on MRI and the presence of the nerve and the normality of brain are essential for taking up a patient for cochlear implantation. Absence of cochlear nerve is a contraindication for cochlear implant surgery. CT helps in estimating cochlear patency and may identify any abnormal variations that may affect electrode insertion or may warranty a change in the choice of side of implantation or a different surgical approach.

PSYCHOLOGICAL EVALUATION

> **Imaging with High resolution Computed Tomography of temporal bone (CT) and Magnetic Resonance Imaging (MRI) form an indispensable part prior to implantation procedure.**

The child must have normal IQ for maximal possible benefits of cochlear implant. A much harder to define candidacy criteria involves assessing whether the overall circumstances gyrating around a candidate be able to justify and promote the use of a cochlear implant. It is important to address the patient's and the family's expectations for life after implantation to wade away any unrealistic supposition they may embark with the surgery and to make them prepared for alternative pathways if the post-implant performance is not as expected. Postoperative speech and hearing rehabilitation is an equally significant task, which may continue extensively for two years and relies totally on the patient's (in case of postlingual deafness) and family's motivation.

(The author is Senior DMO, Department of ENT, Northern Railway Central Hospital, New Delhi)

A SOLUTION FOR DEAFNESS

Cochlear implants can improve hearing in people with severe hearing loss who are no longer helped by using hearing aids. Cochlear implants can improve their communication and quality of life.....

BY ABHIGYAN/ABHINAV

Hearing is a very important sense which helps us to communicate with each other. Lack of hearing makes the person mute also since the development of vocal skills is dependent on normal hearing.

According to **Dr A K Agarwal, Former Dean and ENT Specialist, Maulana Azad Medical College, New Delhi and Presently Medical Advisor, Clinical Innovation, Apollo Hospital, New Delhi**, the hearing loss can be present at birth which is called as congenital hearing loss or it can develop after birth when it is called acquired hearing

loss. The hearing loss occurring after the speech and language development is termed as post lingual hearing loss. The child who is having hearing loss since birth and has not developed speech and language is termed as prelingual deafness.

"There are many causes of congenital deafness. These are hereditary causes which may sometimes be associated with syndromes like Down's syndrome, Waardenburg Syndrome, Usher, Alport etc. Hearing loss can also occur due to maternal infections, complications during childbirth and pregnancy or because of certain drugs taken during pregnancy. It has been observed that mutation in gene leading to synthesis of a protein connexin 26 is responsible non-syndromic deafness. The incidence of congenital deafness in India is around 1-3 per thousand births," Dr Agarwal, added.

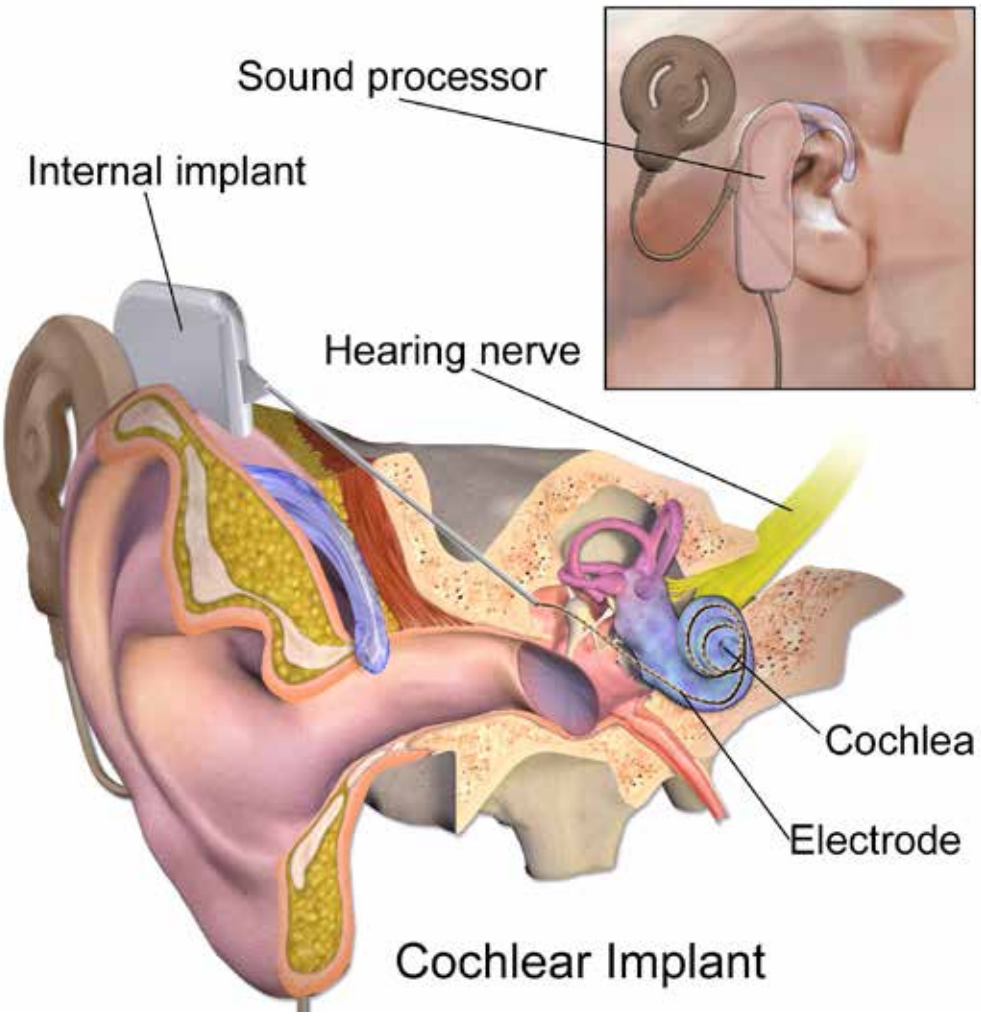
Dr J C Passey, Former, Director Professor and Head, Department of ENT & Head Neck Surgery, Maulana Azad Medical College, said "It is essential to recognise any hearing loss in a child as early as possible since the speech, hearing and overall mental development depends on normal hearing abilities

of the child. Parents have a very important role in early identification of such infants. Usually the child moves his head or blinks in response to loud sound. Also the child may startle or stop moving his limbs when there is a loud sound."

"In case of suspicion the hearing status of the child must be objectively assessed at the earliest. The government of India is trying to make the universal screening of every new born child mandatory before discharge from the medical facility. In case of institutional deliveries, child's hearing status is being routinely screened using otoacoustic emissions (OAE) which can be easily done with a portable hand held machine. Presence of OAE indicates normal hearing but absence of OAE does not mean that the child is deaf and it needs to be confirmed by a more specific objective test." Dr J C Passey, added.

According to ENT Specialists, the

> **The brain's ability to learn new things is slowly lost by the age of 5 years. When a child is rehabilitated for hearing after the age of five years, the normal speech may not develop as the brain has lost the ability to learn speech and language.**



brain's ability to learn new things is slowly lost by the age of 5 years. When a child is rehabilitated for hearing after the age of five years, the normal speech may not develop as the brain has lost the ability to learn speech and language. That is why the deaf child must be diagnosed and rehabilitated at the earliest. Our aim should be to diagnose deafness and rehabilitate the child in the first year of life.

Rehabilitation depends on the degree of hearing loss. A child who is having mild to moderate hearing loss can be provided with a hearing aid. Hearing aid will amplify the sound above the hearing threshold of the child and he will be able to listen. Children with severe to profound deafness will require a cochlear implant though all such children must undergo a hearing aid trial before cochlear implantation.

Cochlear implant is a device which by-passes the inner ear and directly stimulates the cochlear nerve which is responsible for carrying the sound coded electrical signals to brain. The device has an internal part which is surgical implanted inside the ear and comprises of an electrode and a receiver magnet. The electrodes are inserted in the cochlea where they come in direct contact with the nerve endings of the cochlear nerve. The external part has receiver, speech processor and transmitter. The receiver has a microphone which picks up the sounds from external environment and sends it to the speech processor. The speech processor is like a computer which analyzes and digitizes the sound and sends them to a transmitter which stimulates the implanted receiver magnet just under the skin by electromagnetic induction.

Cochlear implants may be placed in one ear (unilateral) or both ears (bilateral). Adults will often have one cochlear implant and one hearing aid at first. Adults may then progress to two cochlear implants as the hearing loss advances in the hearing aid ear. Cochlear implants are often placed in both ears at the same time in children with bilateral severe hearing loss — particularly for infants and children who are learning to speak and process language. Adults of any age and children who are as young as 6 to 12 months old can benefit from cochlear implants.

I HEAR, THEREFORE, I AM

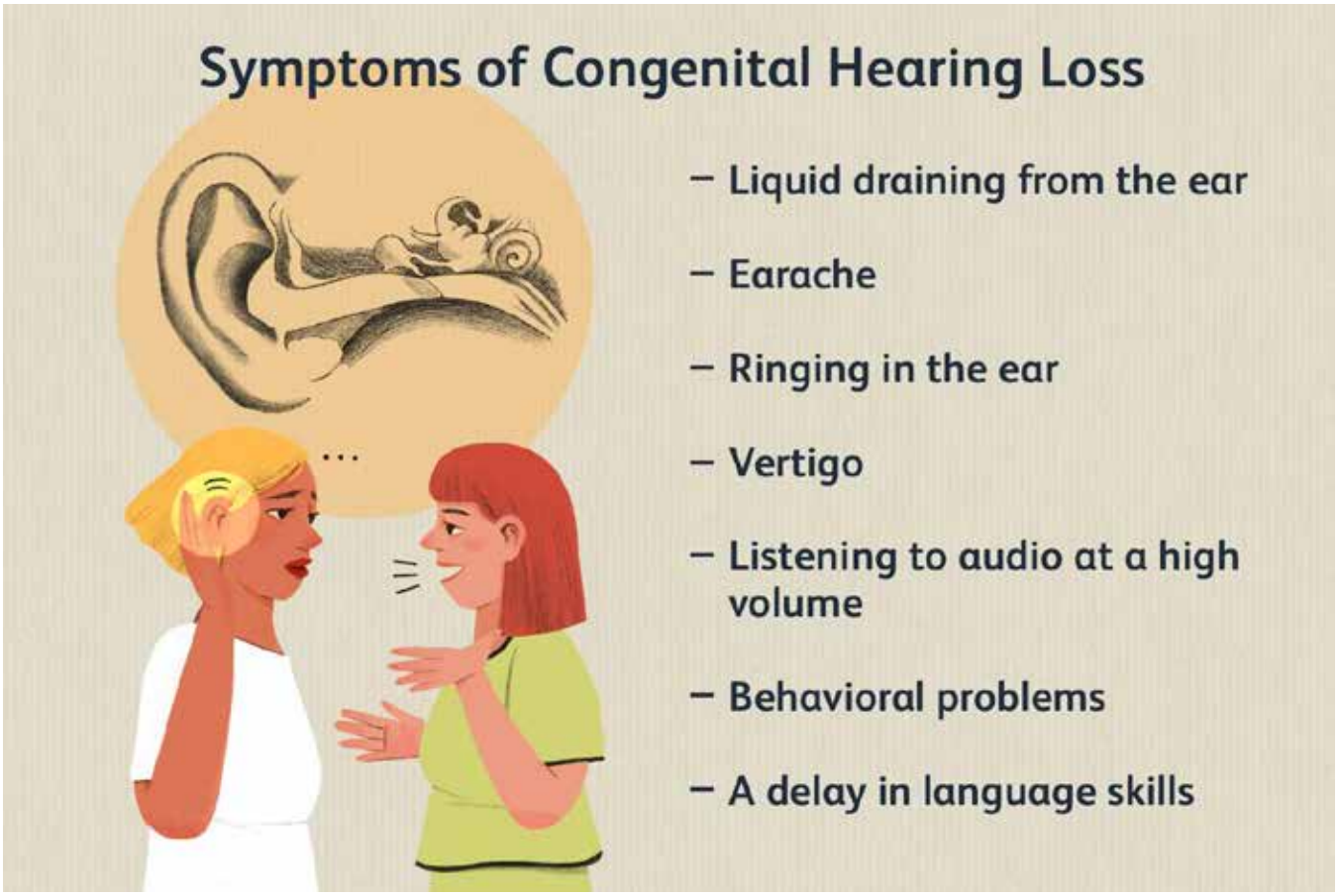
Hearing is vital to human existence as it helps us to communicate with each other. Cochlear Implant has emerged as a ray of hope for people suffering from hearing loss.....

BY DR A K AGARWAL

Ability to hear sounds is closely linked to mental development. The development of vocal skills is dependent on normal hearing. Of late, the problem of hearing loss is on the increase worldwide.

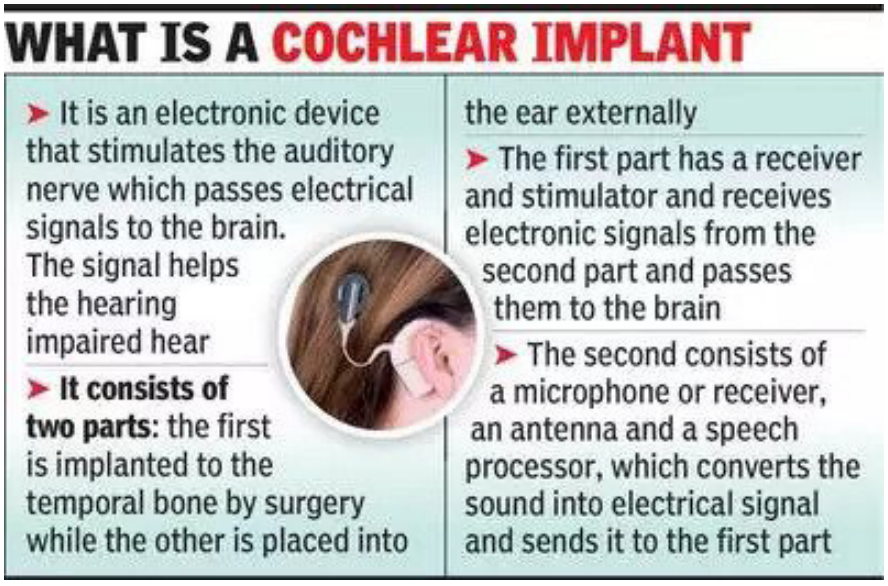
Hearing loss can be present at birth which is called as congenital hearing loss or it can develop after birth when it is called acquired hearing loss. The hearing loss occurring after the speech and language development is termed as post-lingual hearing loss. Having hearing loss since birth and not developing speech and language is termed as prelingual deafness.

There are many causes of congenital deafness. These are hereditary causes which may sometimes be associated with syndromes like Down's syndrome, Waardenburg Syndrome, Usher, Alport

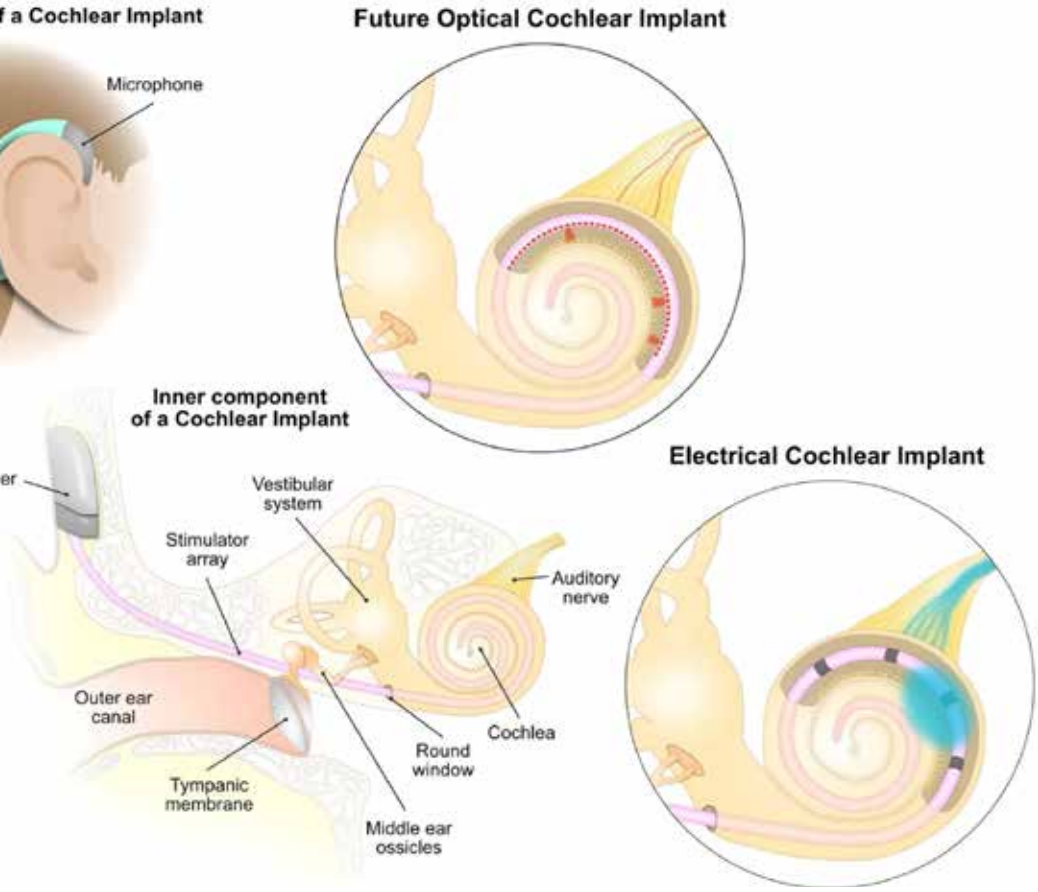


etc. Hearing loss can also occur due to maternal infections, complications during childbirth and pregnancy or because of certain drugs taken during pregnancy. It has been observed that mutation in gene leading to synthesis of a protein connexin 26 is responsible for non-syndromic deafness. The incidence of congenital deafness in India is around 1-3 per thousand births.

It is essential to recognize any hearing loss in a child as early as possible since the speech, hearing and overall mental development depends on normal hearing abilities of the child. Parents have a very important role in early identification of such infants. Usually, the child moves his head or blinks in response to loud sound. Also the child may startle or stop moving his limbs when there is a loud sound. In case of suspicion, the hearing status of the child must be objectively assessed at the earliest.



The government of India is trying to make the universal screening of every new born child mandatory before discharge from the medical facility. In case of institutional deliveries, child's hearing status is being routinely screened using otoacoustic emissions



(OAE) which can be easily done with a portable hand held machine. Presence of OAE indicates normal hearing but absence of OAE does not mean that the child is deaf and it needs to be confirmed by a more specific objective test.

The brain's ability to learn new things is slowly lost by the age of 5 years. When a child is rehabilitated for hearing after the age of five years, the normal speech may not develop as the brain has lost the ability to learn speech and language. That is why the deaf child must be diagnosed and rehabilitated at the earliest. Our aim should be to diagnose deafness and rehabilitate the child in the first year of life.

Rehabilitation depends on the degree of hearing loss. A child who is having mild to moderate hearing loss can be provided with a hearing aid. Hearing aid will amplify the sound above the hearing threshold of the child and he will be able to listen. Children with severe to profound deafness will require a cochlear implant though all such children must undergo a hearing aid trial before cochlear implantation.

COCHLEAR IMPLANT

Cochlear implant is a device which by-passes the inner ear and directly stimulates the cochlear nerve which is responsible for carrying the sound coded electrical signals to the brain. The device has an internal part which is surgically implanted inside the ear and comprises of an electrode and a receiver magnet. The electrodes are inserted in the cochlea where they come in direct contact with the nerve endings of the cochlear nerve. The external part has a receiver, speech processor and transmitter. The receiver has a microphone which picks up the sounds from the external environment and sends it to the speech processor. The speech processor is like a computer which analyzes and digitizes the sound and sends them to a transmitter which stimulates the implanted receiver magnet just under the skin by electromagnetic induction.

(The author is Former Dean and ENT Specialist, Maulana Azad Medical College, New Delhi and Presently, Medical Advisor, Clinical Research, Apollo Hospital, New Delhi)

MUSIC THERAPY FOR HEALTH AND WELLNESS

Today music therapy has proved as positive effects on stress, pain management, mood regulation, cognitive function, and overall quality of life.....

BY DR. CHANDRAKANT S. PANDAV/ RISHI S. BHARADWAJ

Today music therapy has proved as positive effects on stress, pain management, mood regulation, cognitive function, and overall quality of life……

With advent of non-invasive, evidence-based intervention music therapy has gained attention in recent years as a complementary treatment option for a wide range of physical, emotional, and cognitive health issues. The review examines the current state of knowledge regarding music therapy's effectiveness in promoting health and wellness, the mechanisms underlying its therapeutic effects, and its potential as an integrative approach to care.

According to research, the role of music therapy is promoting health and wellness. Music has been used for therapeutic purposes since ancient times, with evidence of its use dating back to the Samveda in India. Shiva's Damru is considered the first musical instrument and highlights the significance of music in ancient cultures.

Dr. Chandrakant S. Pandav

SHIVA'S DAMRU–THE FIRST MUSICAL INSTRUMENT

According to Hindu mythology, Shiva's Damru is believed to be the first musical instrument. It is said that when Shiva played the Damru, it created a sound that encompassed all aspects of creation - from the highest vibrations of the cosmos to the

According to Hindu mythology, Shiva's Damru is believed to be the first musical instrument. It is said that when Shiva played the Damru, it created a sound that encompassed all aspects of creation - from the highest vibrations of the cosmos to the lowest vibrations of the earth.

lowest vibrations of the earth. The Damru is made of a small drum with two sides, and it is played by shaking the drum back and forth while holding it with a string.

The sound of the Damru is considered to be extremely powerful and is believed to have the ability to create and destroy entire universes. It is also said to be a symbol of the heartbeat of the cosmos and the rhythm of life itself. In Hindu tradition, the Damru is often depicted as being held by Nataraja, a form of Shiva that represents the cosmic dance of creation and destruction.

In modern times, the Damru is still used in traditional Indian music, particularly in devotional music and

bhajans. It is also sometimes used in meditation and yoga practices, as the sound of the Damru is believed to help facilitate deep relaxation and spiritual awakening.

Overall, the Damru is an important symbol in Hindu mythology and is considered to be the first musical instrument, with a powerful sound that represents the rhythm of the cosmos and the cycle of life and death.

REFERENCE TO MUSIC IN THE SAMVEDA

The Samveda, an ancient Indian text, is one of the four Vedas that are considered the most sacred and revered texts of Hinduism. It is believed to have been compiled around 1000-500 BCE and is dedicated to the importance of music and its role in promoting spiritual and physical wellbeing.

The Samveda contains numerous references to the healing power of music, highlighting its ability to calm the mind and soothe the soul. The text describes music as a divine language that has the power to connect individuals with the divine, allowing them to experience a state of peace and tranquility.

In the Samveda, the use of music for therapeutic purposes is known as Gandharva Veda. Gandharva Veda was believed to be a branch of Ayurveda, the traditional Indian system of medicine. It was considered an essential tool in the healing process and was used to treat a range of physical and mental ailments.

The Samveda contains detailed descriptions of the various instruments used in Gandharva Veda, including the vina, the flute, and the mridangam. It also includes descriptions of the different ragas or musical modes and their specific therapeutic effects. For example, the raga Bhairavi was believed to have a calming effect and was often used to treat anxiety and insomnia.

The concept of Nada Brahma, which means "sound is God" or "sound is the divine", is another important aspect of the Samveda. According to this concept, sound is considered a manifestation of the divine and has the power to connect individuals with the divine. It was believed that through the use of music, individuals could reach a state of transcendence and experience a deep sense of inner peace and harmony.

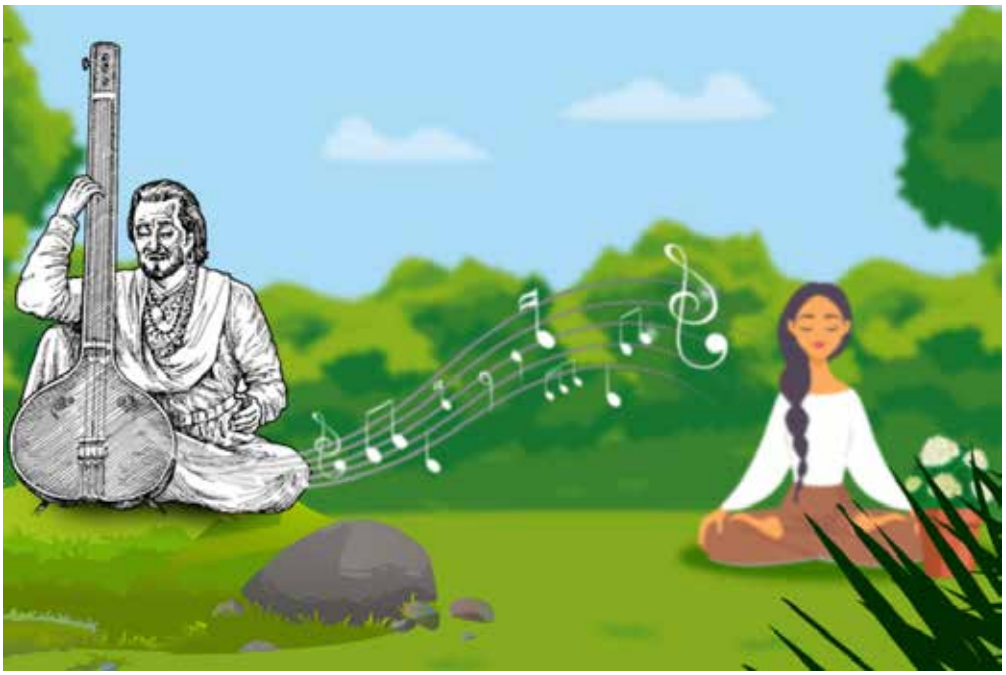
Today, the healing power of music is still recognized in India, with the practice of music therapy being used to treat a range of physical and mental health conditions. The influence of the Samveda can still be seen in modern Indian music therapy practices, with many of the therapeutic techniques and principles being derived from the ancient text.

In conclusion, the Samveda is a testament to the long-standing belief in the healing power of music. Its teachings continue to influence modern music therapy practices, highlighting the enduring significance of this ancient text in promoting physical and spiritual wellbeing.

RAGAS PROMOTING HEALTH AND WELLBEING IN MUSIC THERAPY

There are several ragas or musical modes that have been shown to be effective in music therapy for promoting health and wellbeing. Each raga is believed to have a specific therapeutic effect on the mind and body, and can be used to treat a range of physical and mental health conditions.

For example, the raga Yaman is known for its ability to calm the mind and reduce anxiety. It is often used in music therapy to treat conditions such as insomnia and depression. The raga Bhairavi is another popular raga used in music therapy, known for its ability to promote relaxation and reduce



The raga Yaman is known for its ability to calm the mind and reduce anxiety. It is often used in music therapy to treat conditions such as insomnia and depression. The raga Bhairavi is another popular raga used in music therapy, known for its ability to promote relaxation and reduce stress.

stress.

The raga Todi is believed to have a rejuvenating effect on the body and mind, and is often used to treat conditions such as fatigue and chronic pain. The raga Darbari is believed to have a meditative effect and is used to promote a sense of inner peace and tranquility.

Other ragas commonly used in music therapy include Shree, Malkauns, and Bageshree. Each raga is believed to have its own unique therapeutic effect and can be tailored to the individual needs of the patient.

The therapeutic effects of these ragas are believed to be due to the specific combination of notes and rhythms used in each raga. The notes and rhythms are thought to stimulate specific areas of the brain, promoting the release of certain neurotransmitters and hormones that can influence mood, behavior, and physiological processes.

Overall, the use of specific ragas in music therapy is an important aspect of the practice and highlights the importance of tailoring therapy to the individual needs of each patient. By harnessing the therapeutic power of music, music therapists can provide a safe, non-invasive, and effective treatment option for a range of physical and mental health conditions.

This article also highlights some of the challenges facing the field, including the need for standardized protocols, increased research funding, and greater recognition from healthcare providers. Overall, the evidence suggests that music therapy

has the potential to be a valuable addition to conventional healthcare practices, offering a safe, low-cost, and accessible intervention for individuals seeking to optimize their health and well-being.

Several studies have demonstrated that music therapy can reduce stress and anxiety levels in both healthy individuals and those with chronic illnesses such as cancer and cardiovascular disease. Music therapy has also been shown to be an effective adjunct to pain management, particularly for postoperative pain and chronic pain conditions such as fibromyalgia and osteoarthritis. The studies have also reported improvements in mood and emotional regulation following music therapy interventions, particularly in individuals with depression, anxiety, and dementia. Additionally, music therapy has been found to enhance cognitive function, particularly in domains such as attention, memory, and executive function. Finally, music therapy has been shown to have a positive impact on overall quality of life, including social functioning, self-esteem, and sense of purpose

Music has been a source of comfort, solace, and inspiration for humans throughout history, but it is only in recent years that its potential as a therapeutic tool has been fully recognized. Music therapy is a clinical and evidence-based approach that utilizes music to address physical, emotional, cognitive, and social needs. It is a form of complementary medicine that can be used in conjunction with traditional medical interventions to enhance the overall well-being of patients. Music therapy can be applied in a variety of settings, including hospitals, nursing homes, rehabilitation centers, and private practices, and it has been shown to be effective in treating a range of health conditions. In this review, we explore the scientific evidence behind music therapy's therapeutic effects, the mechanisms by which it works, and its potential as a complementary approach to healthcare.

Music has been found to have a profound impact on human beings, both physiologically and psychologically. The effects of music on the brain and body are complex and can vary depending on factors such as the type of music, the individual's personal preferences and experiences, and the context in which the music is experienced.

At a physiological level, music has been shown to affect heart rate, blood pressure, and respiration. It can also trigger the release of hormones such as cortisol and oxytocin, which can have both positive and negative effects on mood and stress levels. For example, slow, calming music has been found to reduce stress and lower heart rate and blood pressure, while faster, more upbeat music can increase heart rate and arousal.

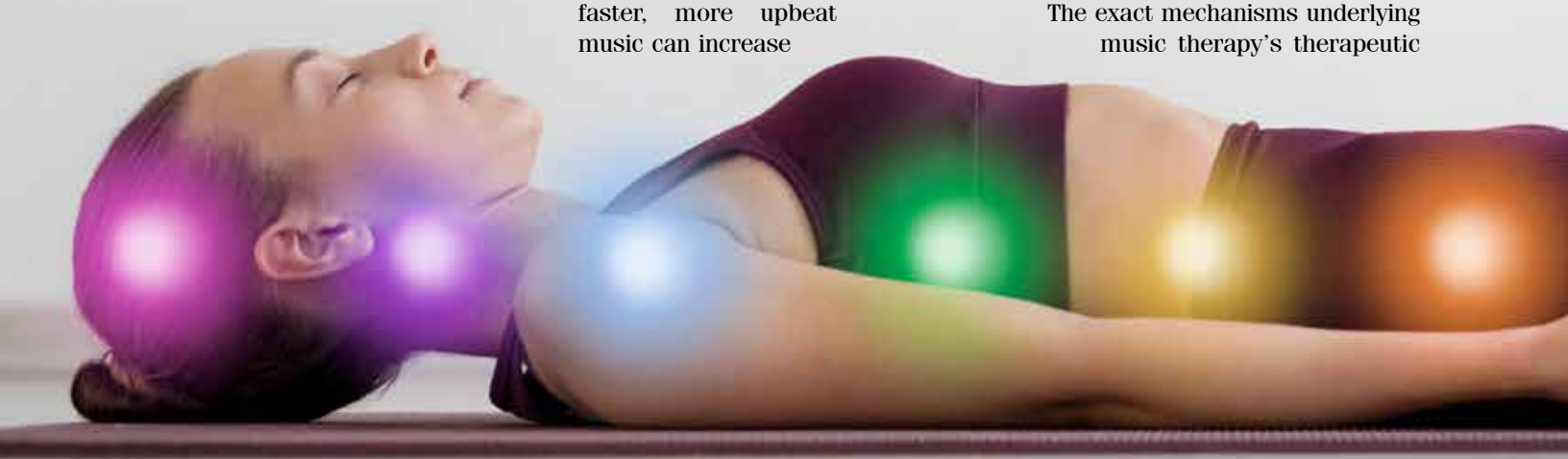
In addition to its physiological effects, music has also been found to have powerful psychological effects. It can evoke a range of emotions, from joy and excitement to sadness and melancholy, and can facilitate emotional expression and regulation. This is thought to be due in part to the way music activates multiple areas of the brain, including regions involved in emotional processing, memory, and attention.

Music has also been shown to have cognitive benefits, such as enhancing attention and memory. This is thought to be due to the way music engages the brain's neural networks, promoting the formation and strengthening of connections between brain regions.

When used in a therapeutic context, music can be a powerful tool for promoting health and wellbeing. Music therapy can be used to help manage symptoms of a range of health conditions, from anxiety and depression to chronic pain and neurological disorders.

Overall, the effects of music on human beings are complex and multifaceted, with both physiological and psychological dimensions. While the mechanisms underlying these effects are still not fully understood, the growing body of research on the subject suggests that music can be a valuable tool for promoting health and wellbeing.

The exact mechanisms underlying music therapy's therapeutic



effects are not yet fully understood, but several theories have been proposed. One theory suggests that music activates the same reward pathways in the brain as other pleasurable experiences, such as food and sex, leading to the release of dopamine and other neurotransmitters associated with pleasure and reward. Another theory suggests that music can modulate the autonomic nervous system, leading to changes in heart rate, blood pressure, and other physiological parameters. Additionally, music therapy may facilitate emotional expression and regulation, which can promote healing and reduce stress. It may also enhance cognitive processes such as attention and memory by engaging multiple areas of the brain.

Despite the growing body of evidence supporting the use of music therapy as a complementary approach to healthcare, the field still faces several challenges. One of the major challenges is the lack of standardized protocols for music therapy interventions. While there is some consensus on basic principles of music therapy, such as the importance of individualization and the use of live music, there is still significant variation in the way music therapy is practiced across different settings and practitioners. This variability can make it difficult to compare results across studies and may limit the broader adoption of music therapy as a treatment option.

Another challenge facing the field is the need for more research funding. While there have been several high-quality studies demonstrating the effectiveness of music therapy, more research is needed to fully understand the mechanisms underlying its therapeutic effects and to identify the most effective interventions for specific health conditions. Funding for music therapy research is often limited, however, due to a lack of awareness and understanding of the field among funding agencies.

Finally, there is a need for greater recognition of music therapy among healthcare providers. While many healthcare professionals are aware of music therapy, it is still not widely integrated into conventional healthcare practices. This may be due in part to a lack of understanding of the evidence supporting its effectiveness, as well as a lack of standardized training programs for music therapists.

Music therapy is a promising complementary approach to healthcare that has been shown to have positive effects on a range of health outcomes. While the field still faces several challenges, including the need for standardized protocols, increased research funding, and greater recognition among healthcare providers, the evidence suggests that music therapy has the potential to be a valuable addition to conventional healthcare practices. Future research should focus on identifying the most effective music therapy interventions for specific health conditions and on further elucidating the mechanisms underlying its therapeutic effects.

(The authors are Padmashree Awardee (2021), Former Professor & Head, Centre for Community Medicine, AIIMS, New Delhi/ Adjunct Professor, Symbiosis Skills and Professional University, Pune)

UN-KNOWN ENEMY

It may sound unbelievable but it's true that hypertension, commonly seen in adults, is not uncommon in children, especially those who are obese.....

BY TEAM DOUBLE HELICAL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Growing habit of sedentary lifestyle, lack of exercise, heavy consumption of fast food and intake of steroid either during pregnancy or from any sources may lead to problem of high blood pressure commonly called hypertension in children, even new-borns too.

The problem may go undetected, because many times there are no symptoms or signs of this disease. If left untreated hypertension can lead to heart failure, vision problems, kidney failure, paralysis and stroke early in life.

According to **Dr. H P Singh, Senior child specialist, Mother Child Centre, Ghaziabad,** it is a general belief that high blood pressure (hypertension) as a problem affects only adults. Contrary to this belief, hypertension can be present at any age, even in newborns and young children. When the parents learn that their child has hypertension, it is very natural for them to deny the possibility due to their ignorance. It is for the paediatrician and the paediatric nephrologist to clear their doubts and to initiate appropriate management plan.

Blood pressure is the force of the blood against the walls of blood vessels as the heart pumps bloods to various parts of the body. If this pressure becomes too high, the child is said to have high blood pressure or hypertension.

"As in adults, a child's BP is read as two numbers. The first number or systolic BP is the pressure when the heart is pumping blood to various parts of the body. The second number or the diastolic BP is when the heart is resting between the beats. The diastolic BP is less than the systolic BP. A child is considered to be hypertensive when either the systolic, diastolic or both blood pressures are high". **added, Dr. H P Singh**

According to a report, approximately 2-5% of children suffer from hypertension, with the majority unaware that they have this problem. A rise in incidence of hypertension has been linked to concurrent increase in prevalence of obesity. The prevalence of hypertension in obese children is higher and ranges from 10-30%.

The obese children are more prone to hypertension. If hypertension is allowed to continue or become worse over years, the prolonged extra pressure in the blood vessels can lead to heart failure, stroke, damage to eyes and kidney even in children.

Normal BP is lower in children than in adults. BP increases with age and body size. Normal BP for a child will depend on the child's age, sex and height. We compare your child's BP to readings given on BP charts which lists normal BP or high BP for boys and girls based on their height and age. A child is said to be hypertensive if his average systolic or diastolic BP is more than 95th percentile (according to the standardized charts) for age, gender and height on more than 3 occasions. The doctor is the best person to read and interpret the charts.

Dr Sachin Bhargava, Senior Child Specialist, President Academy of Pediatrics, Trans Hindon, Ghaziabad. "To label a child as hypertensive, BP charts have been issued by the fourth US task force report on hypertension .These are charts consulted by doctors to arrive at a conclusion whether the child has hypertension or not. Since these charts are difficult to interpret and not easily

available to parents, it is recommended that if your child's BP is beyond the values listed in the table here for the specific age group, you need to consult your doctor (paediatrician/paediatric nephrologist)"

Hypertension has been graded according to the B.P readings like Prehypertension: - Blood pressure is > 90th percentile but <95th percentile (as per BP chart). Children in this range of BP should be carefully followed up as they grow up. And stage 1 hypertension (Unsafe):- BP exceeds 95th percentile up to 5 mm above 99th percentile. Blood pressure in this range should be rechecked at least twice in the next 1-3 week or even earlier. Stage 2 hypertension (Dangerous):- BP exceeds 5 mm or more above the 99th percentile. Confirmation should be made at the same visit.

Children who are more than 3 years and are seen at health care setting (for example cold, cough or fever) should have their blood pressure measured. Children who are less than 3 years should get their BP cheeked if they have:

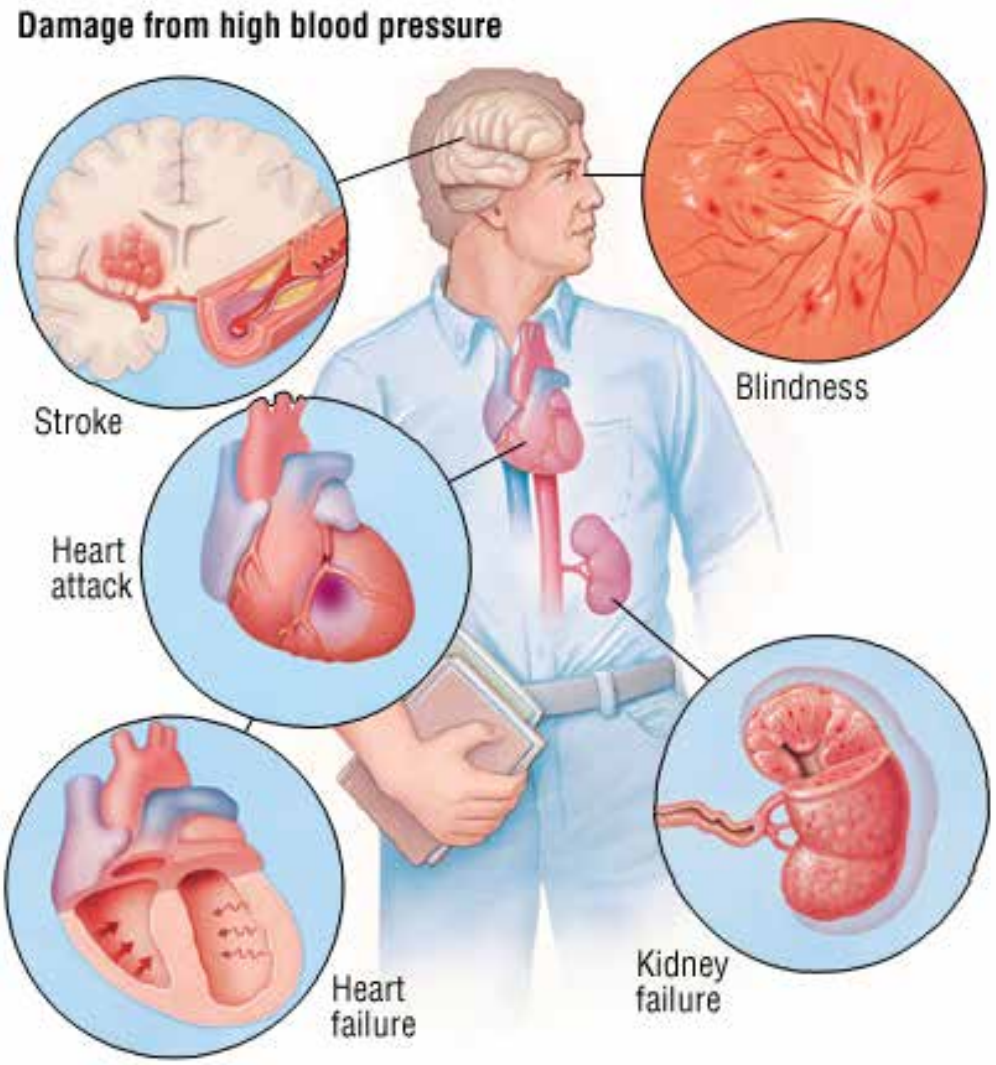
Age (years)	BP (mm Hg)
0 – 5 years	100/70
5 – 10 years	120/80
>10years	130/90

- History of low birth weight, prematurity or requirement of neonatal intensive care,
- History of heart disease by birth
- History of recurrent urinary tract infection
- History of blood or protein loss in urine
- History of any kidney disease in the past
- Family history of kidney disease
- History of organ transplantation
- History of receiving medicines which can cause high blood

pressure/kidney damage.

"The usual symptoms of hypertension are headache (sometimes throbbing in nature), flushing, giddiness, bleeding from nose, vision disturbances, poor school performance, irritability, blood or protein in urine, passing urine more or less frequently and weight loss. In some cases hypertension can be without symptoms and therefore those children who are obese, have history of neonatal intensive care stay, or have kidney/ heart disease or cardiac disease should have their blood pressure checked". said **Dr Sachin Bhargava**

Generally it is preferred to check the blood pressure when the child is sitting comfortably in a chair with feet on the



Most children with essential hypertension require lifestyle modifications which include weight reduction, meditation, yoga, exercise, low salt diet.

ground and the arm at the level of the heart. The BP cuff should be of the right size for the child's age. The width of the cuff bladder (rubber inside the outer cloth) should be 40% of the arm circumference midway between the shoulder and elbow joint and the length should be double the width. Another simple way is to get a bladder cuff whose width covers ¾ of the upper arm. If the cuff size is not appropriate the blood pressure readings may come falsely high or low. However if an appropriate cuff size is not available the next bigger size can be used. Cuff sizes with a width of 4 cm, 9cm, 10cm, 13cm, and 20cm are available in the market.

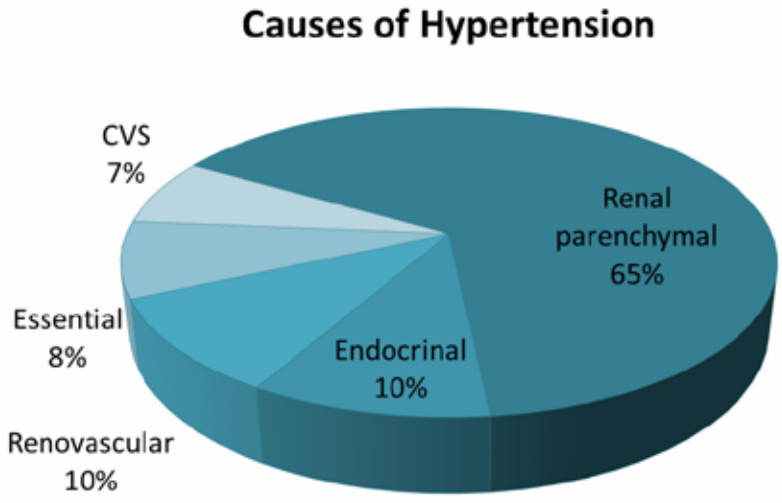
Mercury instruments are the best for checking blood pressure, but as they are being phased out, aneroid devices are being used more commonly and they are fairly accurate, but they require frequent calibration. Automatic BP machines are also being used. If an automatic (digital) blood pressure machine is being used and blood pressure readings come high, then they need to be confirmed with mercury or aneroid device.

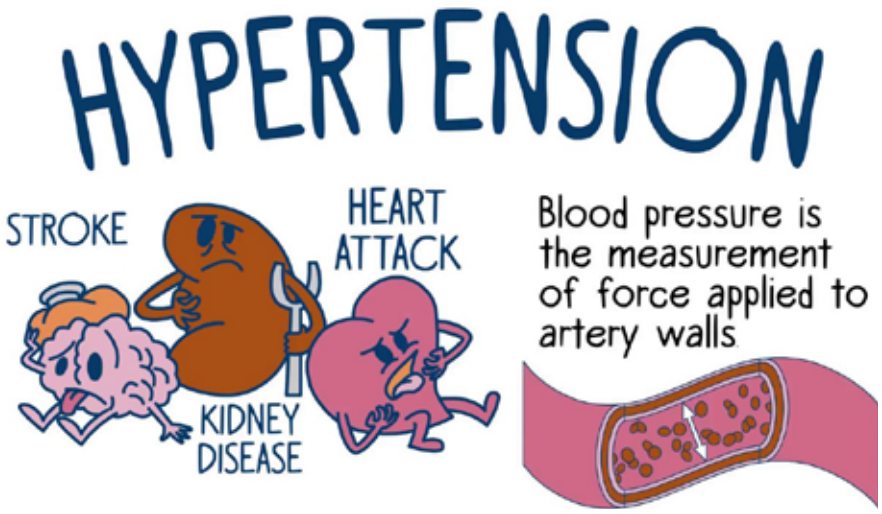
Ambulatory Blood Pressure Monitoring (ABPM) means blood pressure is recorded over a 24 hours period by a BP monitor where cuff is tied to the arm and a small digital blood pressure machine is attached to a belt around the waist. The child

carries on his/her normal activities in the day and sleep with it, while the machine is on. The machine takes the blood pressure readings at regular intervals usually every 15-30 minutes during the day and night. The monitor should be kept on throughout the night. At the end of 24 hours the cuff and the machine are removed and given to the hospital for analysis of readings.

For the machine to work properly, it is important to make sure that the tube attached to the machine is not twisted or bent. As a parent you are instructed to maintain a diary, to note the timing of going to bed, medication and general activities. There are a number of reasons why a doctor advises 24 hour ABPM, which are to find out if the high BP reading in the clinic is higher than the reading away from clinic e.g. home (called white coat hypertension), to see how well the medicines are working and whether they are controlling the blood pressure all the time and to see whether blood pressure at night is less than the recording during day time.

In majority of young children an underlying cause of hypertension can be identified e.g. kidney, heart, blood vessels, hormone problems, tumour or drugs. Diseases of the kidney are the most common cause of hypertension in children. Primary or essential





hypertension, commonly seen in adults, is becoming common in children, who are obese or over weight.

If a cause for hypertension is diagnosed, appropriate treatment can be initiated and the child may have normal blood pressure afterwards. For few reasons, a child may have to remain on anti-hypertensive medicines throughout the life. Once a child is diagnosed to have hypertension, it is very important to evaluate any underlying disease and to find out risk factors for essential hypertension like obesity, smoking, alcohol, etc. In addition tests are required to find out if any complication (involvement of eye, heart or kidney) has occurred or not. The common tests which may be required are kidney function tests, hormone levels, lipid profile, urine examination, ultrasound and doppler test of kidney, kidney scan, echocardiogram, ECG and eye examination.

Most children with essential hypertension require lifestyle modifications which include weight reduction, meditation, yoga, exercise, low salt diet. Other risk factors like smoking, alcohol, steroids, oral contraceptives, sleep apnea should also be controlled. For secondary hypertension, surgery helps in certain cases, e.g. if any tumour is causing hypertension, then it needs to be removed surgically. Timely detection helps in appropriate treatment of hypertension and its cause and helps to prevent end organ damage in adult life.

INDICATIONS FOR DRUG TREATMENT IN HYPERTENSION

a. Stage 1 hypertension persisting even 6 months after lifestyle modifications or those who have any pre existing kidney disease
b. Stage 2 hypertension
c. Damage to eye, kidney, heart, or brain has occurred
d. Pre hypertension in a child with chronic kidney disease, diabetes or lipid abnormalities.

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