RNI No.: UPENG/2014/59232

A COMPLETE HEALTH JOURNAL

Double Helical

DOUBLE HELICAL

April - May 2026

VOL X, Issue- IX, Rs. 200

AN ART FUL

Balance of comfort and craftsmanship

Design that elevates everyday living

INTERIOR DESIGN SOLUTIONS

- RESIDENT INTERIOR
- COMMERCIAL INTERIORS
- RETAIL INTERIORS
- CUSTOMIZED ART EFFECTS

CONTACT US FOR FREE CONSULTATION
+91 9599185966

FOLLOW US @KARISHMATREHANDESIGNS

KT

KARISHMA TREHAN DESIGNS

641P, NEAR SUBHASH CHOWK, SECTOR 38, GURUGRAM, HR 122001
EMAIL: INFO@KTREHANDESIGNS.COM / WWW.KTREHANDESIGNS.COM

DOUBLE HELICAL

A COMPLETE HEALTH MAGAZINE

Volume X Issue IX
Apr-May 2026

Double Helical is owned, printed and published monthly. It is printed at Polykam offset, Naraina Industrial Area Phase 1, New Delhi-110028, and published from G-1, Antriksh Green, Kaushambi, Ghaziabad-201 012.
Tel: 0120-4165606 / 9953604965.

Contact us :
contact@doublehelical.com
doublehelicaldesign@gmail.com,
editorial@doublehelical.com
Website: www.doublehelical.com,
www.doublehelical.in

Contents

Facebook: https://www.facebook.com/Double-Helical-1783106448421622/?modal=admin_todo_tour

Twitter: @HelicalDouble

Youtube: https://www.youtube.com/channel/UCmbMtYUwuppYzDHd_OrcMfg/featured?view_as=subscriber

Merit Under Siege Again

Dear Readers,

This month, we take up a subject that decides the fate of aspiring doctors. The recent news of the 2026 National Eligibility cum Entrance Test (Undergraduate), known as NEET-UG, being cancelled due to a paper leak indicates that the lessons have not been learnt from past scams related to admission to medical courses in the country.

The central government is again on the back foot due to the recent episode. This is an acute embarrassment and is being widely reported in the national media. The government has cancelled the exam, held on May 3, and announced that it will be re-conducted on dates to be notified. For millions of aspiring doctors who spent months and, in some cases, years preparing for the test, the announcement has been devastating.

NEET-UG is the gateway to studying medicine in India and is required for admission to medical colleges across the country. Nearly 2.28 million candidates wrote the exam on 3 May at more than 5,000 centres across India. Police officials claimed they were looking at a guess paper, which was allegedly circulated ahead of the test. A guess paper is a set of questions that teachers or coaching institutes predict could appear in an exam, based on past papers and exam patterns. The guess paper contained around 410 questions, about 120 of which are said to have appeared in the chemistry section of the actual exam. There are four different versions or sets of the NEET paper, each containing 180 compulsory questions divided across the Physics, Chemistry and Biology sections. The case has now been handed over to the Central Bureau of Investigation (CBI).

In the 2024 NEET-UG scam, while the NTA initially dismissed social media reports of paper leaks, investigations by the Economic Offences Unit (EOU) in Bihar and raids in Godhra, Gujarat, uncovered evidence of localised malpractices. In Patna, police arrested 13 people, including four examinees, who had allegedly paid sums ranging from ₹30 lakh to ₹50 lakh to obtain the question paper beforehand. In Godhra, a raid at an exam centre revealed that a teacher, who was also the deputy superintendent, instructed students not to answer questions they did not know, promising to fill in their blank OMR sheets. Five people were arrested, and it was discovered that candidates from multiple states had taken the exam at this centre.

Alongside this we are covering the scale of rabies as a special story. The true scale of rabies' impact in India is shrouded in conflicting mortality statistics. The gap between the NCDC data, which reported 54 deaths, and the WHO estimate of 20,000 deaths in a year, indicates the apathy of policymakers in ensuring a robust surveillance system for a disease with a 100 per cent fatality rate.

This issue also looks into the spike in cases of sudden heart attacks, cardiac arrests, and other cardiovascular complications among all age groups across the country since the mass COVID-19 vaccine rollout. Even seemingly fit people have died of cardiac health issues while walking on the street, on the dance floor and even while sitting at a desk.

Also, Jackson, son of Australian cricket legend Shane Warne, has blamed the COVID-19 vaccine for precipitating his father's death. He went so far as to say that this line of thinking is not controversial anymore. Perhaps reports from around the world of rising cardiac and vascular events after population-level mass vaccine rollouts made him think along these lines.

While Jackson admitted that his father had underlying health issues, he asserted that the jabs contributed to the sudden death. What makes Warne's unfortunate and untimely death more poignant (in case the vaccine was responsible) is that he had recovered from COVID-19 before taking the shots. By all principles of immunology and current evidence, the jabs were not indicated.

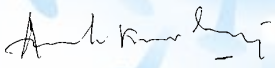
Like a cricket pitch, the presence of comorbidities cannot automatically explain every death among the vaccinated. In cricket, the pitch often shapes the outcome, especially in Test matches, the format in which Shane Warne built his legend. A dry, dusty and worn surface gives spinners a clear advantage, and Warne could use such conditions far more effectively than an ordinary bowler.

The same logic can be applied cautiously to health outcomes. If a person already has underlying medical conditions, any intervention carrying a possible risk may have a greater impact than it would on a healthier body. Therefore, the presence of comorbidities should not, by itself, rule out the possible role of an intervention in a fatal outcome. At the same time, it would be equally wrong to conclude, on the basis of one case alone, that the vaccine caused Warne's death. Life, like cricket, is shaped by uncertainty. Even a great spinner can go wicketless on a helpful pitch. That is why one tragic case, even involving a global sporting icon, should be seen as a prompt to examine the larger pattern rather than as final proof of causation.

The issue carries many more engaging, informative and interesting stories.

Happy reading!

Thanks and regards,



Amresh K Tiwari
Editor-in-Chief

1st IGBC PLATINUM-RATED GREEN HOME in Delhi NCR

Step into regal living at Gulshan Dynasty, Sector 144, Noida, the epitome of luxury and NCR's most sustainable and efficient building, redefining residential excellence.

GULSHAN DYNASTY

MAKE THE RISE, MAKE THE CALL

Schedule your exclusive preview: +91 8010 444 888 | www.gulshandynasty.com

Pushpanjali Medical Centre Holds Session on Loneliness and Depression

In an era of constant connectivity yet deep emotional isolation, loneliness and depression are rapidly emerging as some of the most serious mental health challenges of our time.

Pushpanjali Medical Education and Research Centre, in collaboration with RAHEE and the Subhashan Foundation, recently organised a focused mental health session titled "Loneliness and Depression: Implications & Solutions."

The session featured distinguished speakers such as Prof (Dr) Nimesh Desai, Former Director, IHBAS; Dr Harijit Singh Bhatti, Healthy Ageing Activist and Geriatric Specialist, New Delhi; and Dr Deepika Verma, Consultant Psychiatrist, Pushpanjali Medical Centre. The session was moderated by Poonam Gaur, Counsellor and Director, RAHEE, along with Rashmi Dhuriya, Founder & Lead Clinical Psychologist, STHIR – The Mind's Clinic. The panel discussion was moderated by Dr Druhin Grover, Consultant Psychiatrist, and Dr Prabhani Bindra, Consultant Psychiatrist,

Pushpanjali Medical Centre.

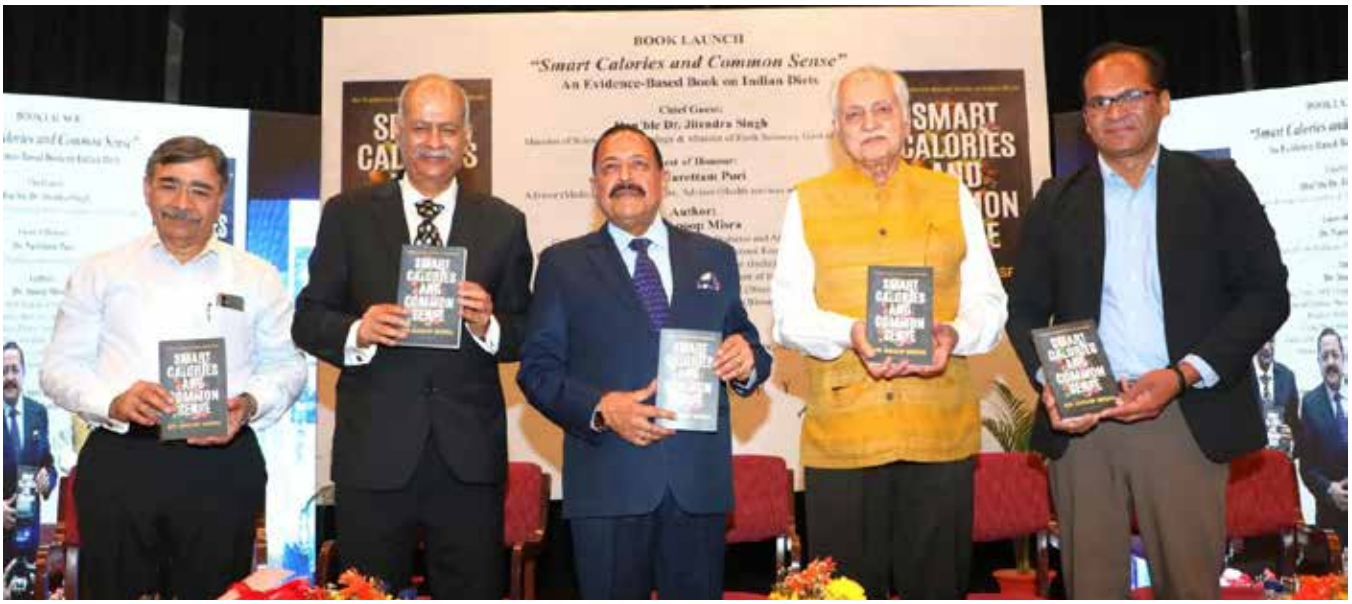
Dr Vinay Aggarwal, Chairman & Managing Director, said, "Around the world, an invisible threat is increasing the risk of disease, shortening lives, and fraying the fabric of our communities. Social disconnection — when a person lacks sufficient social contact, feels unsupported in their existing relationships, or experiences negative or strained connections — is an increasingly serious but often overlooked danger to health and well-being. There are several forms of social disconnection, including loneliness and social isolation."

Dr Vinay Aggarwal added, "Today nearly one in six people globally report feeling lonely. Among adolescents and young adults, as well as people living in low-income countries, the rate is even

higher. But loneliness and social isolation are not just emotional states. We now have irrefutable evidence that social health — our ability to form and maintain meaningful human connections — is just as essential to our well-being as physical and mental health. Yet for too long, it has been ignored by health systems and policymakers alike."

Recognising this urgent need, the experts warned that loneliness is no longer just an emotional state — it is a significant risk factor linked to depression, anxiety, and even physical health conditions. Senior citizens, working professionals, and youth alike are increasingly vulnerable.

The session brought together leading psychiatrists and mental health professionals to decode the hidden signs of depression, address the impact of social isolation, offer practical, real-world coping strategies, and encourage open conversations around mental health. On this occasion, a thought-provoking street play was performed by the Asmita Theatre Group. It highlighted the lived realities of those silently struggling, making the issue more relatable and urgent. Organisers emphasised that breaking the silence is the first step toward healing, and that such platforms are crucial for normalising help-seeking behaviour and building emotionally supportive communities.



Dr Jitendra Singh Releases Book on Diets

A new book, "Smart Calories and Common Sense: An Evidence-Based Guide to Indian Diets," was recently launched by Union Minister Dr Jitendra Singh, who is also a Professor of Medicine & Diabetes. The book has been authored by Dr Anoop Misra, Senior Diabetologist at Fortis Hospital, New Delhi.

On this occasion, Dr Jitendra Singh said that while awareness about diet and lifestyle diseases such as diabetes and obesity is essential, equal attention must be given to checking the spread of misinformation and disinformation in the public domain. He said, "The diet cannot be reduced to generalised prescriptions or uniform charts. Each individual must understand and adapt according to their own body, lifestyle, and metabolic needs."

According to him, diet is too important a subject to be left to any one group alone, emphasising that individuals must actively observe and learn from their own dietary responses over time.

Dr Narottam Puri, Advisor (Medical), Fortis Healthcare and Advisor (Health Services and MVT), FICCI, was also present as Guest of Honour.

The event brought together leading members of the medical and scientific community, including senior clinicians and experts in diabetes and nutrition.

Reflecting on evolving dietary trends, Dr Anoop Misra referred to changing scientific views over the years — from refined oils to traditional fats, and from sugar substitutes to natural alternatives — indicating that scientific understanding in nutrition continues to evolve. He believes that conclusions in dietary science are often based on population-level evidence and may not apply uniformly to every individual.

He also highlighted the importance of clinical judgment and patient interaction, recalling an earlier era where diagnosis depended significantly on detailed history-taking and observation. He noted that excessive reliance on reports and standardised prescriptions may sometimes overlook individual variations.

Dr Anoop Misra cautioned against the growing commercialisation in healthcare and diet advisory practices, warning that attractive or overly complex diet plans often gain popularity despite lacking practical relevance. In this context, he reiterated the need for balanced, informed, and evidence-based guidance. He also noted the importance of meal distribution alongside quality and quantity, stating that dietary timing and portioning remain underemphasised in common practice.

The Union Minister shared examples to illustrate how lifestyle, habits, and individual body responses play a decisive role in determining suitable dietary patterns. The Minister concluded by stating that there is no single ideal diet applicable to all, and individuals must develop awareness through observation, moderation, and informed choices, while remaining cautious of unverified claims and trends.

CHOKED EXISTENCE

Asthma is more than just wheezing—it's a chronic inflammatory disorder affecting both adults and children. From winter triggers to missed diagnoses, understanding this condition is the first step toward proper precautions, early action, and control.

BY ABHIGYAN

Asthma is a persistent disease of the bronchial (air shafts), or in other words, a chronic inflammatory disorder of the airways that makes breathing difficult. It is usually connected to an allergic reaction or other forms of hypersensitivity. Characterised by recurrent, reversible airway obstruction, airway inflammation in asthma leads to airway hyperactivity, which causes the airways to narrow in response to various stimuli, including allergens, exercise, and cold air.

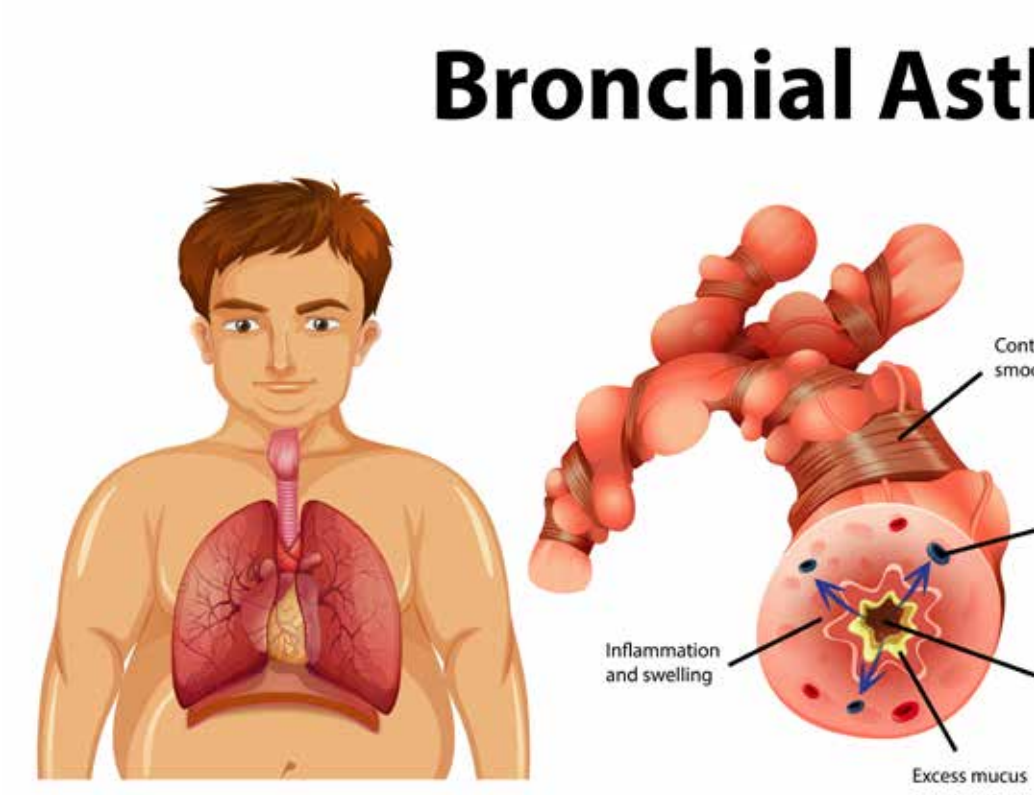
Asthma is a growing concern worldwide. The same is true in India. In fact, the Global Burden of Disease (GBD) has highlighted that the total burden of asthma in India is 34.3 million, accounting for 13.09 per cent of the global burden.

An asthma attack is a sudden worsening of asthma symptoms caused by the tightening of muscles around your airways (bronchospasm). During an asthma attack, the lining of the airways also becomes swollen or inflamed, and more mucus than normal is produced. All of these factors — bronchospasm, inflammation, and mucus production — worsen asthma conditions.

Symptoms of an asthma attack include severe wheezing when breathing both in and out; coughing that won't stop; very rapid breathing; chest tightness or pressure; tightened neck and chest muscles (called retractions); difficulty talking; feelings of anxiety or panic; pale, sweaty face; blue lips or fingernails; or worsening symptoms despite use of your medication.

Sometimes asthma symptoms include sighing, fatigue, and rapid breathing, without coughing or wheezing.

As for precautions: you should never forget your inhaler; stay calm; beware of indoor allergens; and never breathe through your mouth.



India accounts for over 34 million asthma cases—13% of the global burden. Yet, many mild cases, especially in children, go undiagnosed because they present with only a persistent cough rather than classic wheezing. Recognising these subtle signs is critical.

WINTER WOES

As winter approaches, city doctors ring alarms for patients with respiratory issues. Experts opine that patients suffering from respiratory issues, especially those with asthma, must start taking precautions to keep their health issue under control, as it is common for people to rush to hospitals for asthma flare-ups due to lack of proper precautions during winter.

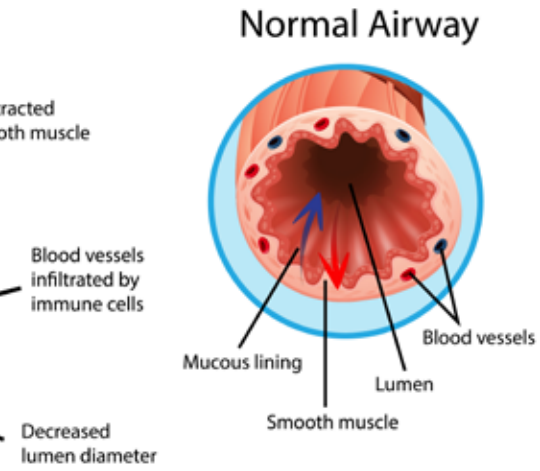
Asthma problems gradually increase in winter for people. Cold weather can cause asthma to flare up more than usual, not to mention the extra threat of colds and flu, which can badly affect the respiratory system. There are more risks and more attacks in winter because people usually spend more time inside during winter, and it is cold outside. Hence the challenges in winter increase for people with asthma.

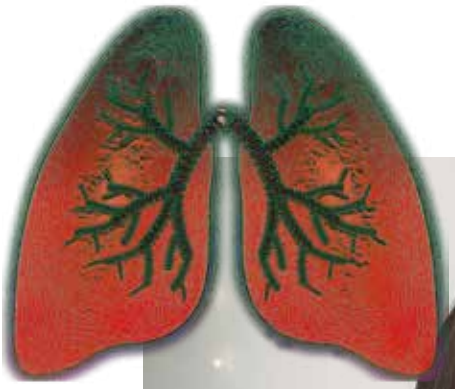
To avoid the spread of infections or catching a cold, one should always wash one's hands properly with soap and water. Alcohol-based sanitizers work best for this.

One should not sit by a fireplace as the smoke of burning wood is similar to burning tobacco and triggers asthma.

During winter, one should always exercise indoors as it can be bitterly cold outside. It is advised to exercise in a gym or in the midafternoon to avoid asthmatic problems. On days when it is bitterly cold outside and the wind chill makes it feel like it's below zero, doctors recommend going to the gym instead of

hma





Cold air, indoor heating, dust, and the seasonal flu make winter a danger zone for asthmatics. Doctors warn against exercising outdoors in freezing temperatures and recommend wearing a scarf over the mouth to warm inhaled air. A flu shot (injectable, not nasal spray) is essential.

exercising outside. The temperatures and the humidity in the gym are less likely to cause a problem. If you still want to exercise in the fresh (albeit cold) air, choose a time of day when it might be warmer, such as midafternoon.

Your home heating system may blow dust and debris throughout your house, especially when you first start it up for the winter. It's important to clean and replace filters before turning on your system so as not to release debris and trigger an asthma attack. Clean and check the filters periodically throughout the heating season to avoid issues with winter asthma. Also, try to keep the temperature and humidity levels in your home consistent.

The Centers for Disease Control and Prevention (CDC) recommends that most people should get an annual flu shot to help protect against the flu virus. Having asthma won't make you more susceptible to catching the flu, but if you do get the flu, the results could be more serious, even if you keep your asthma symptoms under control. It's important that people with asthma get the injectable form of the flu vaccine made with inactivated (killed) flu virus. People with asthma shouldn't get the nasal

spray (FluMist) vaccine because it contains live virus.

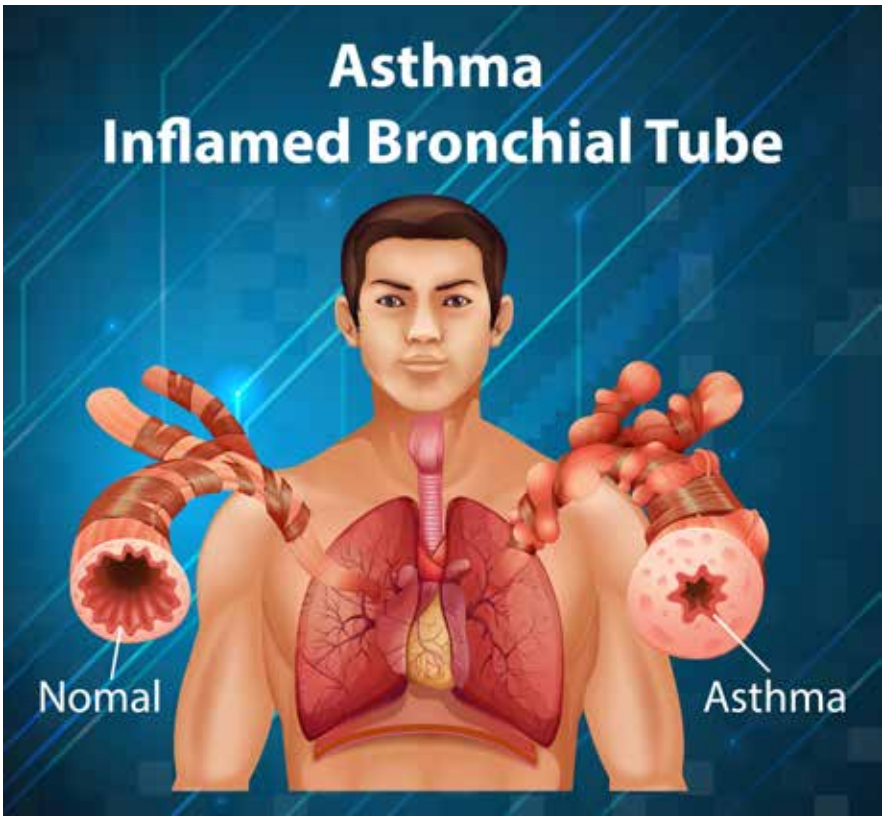
According to Dr Pankaj Sayal, Senior Consultant in Pulmonology, New Delhi, there are many reasons why winter is a problem for asthmatics. The cold air itself is a common trigger of breathlessness and asthma attacks, plus winter brings an increase in colds and respiratory infections like Swine Flu, etc. Being indoors can cause problems too, as the air is often of poor quality during winter because we prevent fresh air circulation by closing doors and windows against the chill. Much of this is unavoidable, so it's important that you and those around you know your asthma plan in case you do have an attack. Smog is another factor which can aggravate asthma for people living in and around Delhi.

To be extra safe during winter, pull a neck gaiter, scarf, or turtleneck up over your mouth and nose to warm the air you are inhaling. Avoid exercising outdoors when it's very cold outside. It is also advised to change the filters of your heating system each year before winter starts.

According to Dr Jagadish Hiremath, Chairman at AASRA Hospitals, breathing cold and dry air during winter can cause flare-ups as it causes irritation to the airways and increases the production of phlegm, making asthma worse. In addition to that is rising air pollution, which is also a major asthma trigger as there is an increase in irritants in the air due to increased pollution.

CHILDHOOD ASTHMA

Asthma is the leading cause of chronic illness in children. It can begin at any age, but most children have their first symptoms by age five. Therefore, early diagnosis is important. Childhood asthma is a condition that is under-recognised, under-estimated, under-treated, and responsible for considerable morbidity among children aged one to four years.



According to Dr G C Khilnani, Chairman of the Institute of Pulmonary, Critical Care and Sleep Medicine at PSRI Hospital and Research Institute, New Delhi, "Ten per cent of the world population suffers from asthma. India is no different. In Delhi/NCR, every third child suffers from asthma, requiring nebulisation."

Children with recurrent cough, wheezing, chest tightness, or shortness of breath may have one or more forms of asthma. If left untreated, asthmatic children often have less stamina than other children or avoid physical activities to prevent coughing or wheezing. Sometimes they complain that their chest hurts or that they cannot catch their breath. Colds may go straight to their chest, or they may cough when sick, particularly at night.

Asthma has multiple causes, and it is not uncommon for two or more different causes to be present in one child. Asthma is more than wheezing. Coughing, recurrent bronchitis, and shortness of breath, especially when exercising, are also ways that asthma appears.

For some children, severe asthma

"One in three children in Delhi/NCR suffers from asthma-like symptoms requiring nebulisation. Warning signs include chronic cough, low stamina, rapid breathing, and retractions (see-saw chest motions). Early diagnosis before age five can prevent life-threatening emergencies.

attacks can be life-threatening and require emergency treatment. Signs and symptoms of an asthma emergency in children under five years old include gasping for air, breathing in so hard that the abdomen is sucked under the ribs, and trouble speaking because of restricted breathing.

INVESTIGATING CHILDHOOD ASTHMA

Studies have found that amongst unlabelled asthmatics, cough and other mild symptoms of asthma are predominant, whereas wheezing and shortness of breath are more common among labelled asthmatics. In India, studies determining the prevalence of asthma in schoolchildren have been reported, but no study has been done to determine the factors for underdiagnosis of asthma. Thus, it was felt necessary to study the underdiagnosis of asthma in schoolchildren and its related factors using questionnaires and pulmonary function tests.

A cross-sectional study was carried out on 1000 schoolchildren studying in three public schools of Delhi and Haryana aged 10 to 17 years over a period of one year. It aimed to study underdiagnosis of asthma in schoolchildren and its related factors. Questionnaires including details of medical, social, and environmental factors precipitating asthma were filled out by parents and class teachers. A pulmonary function test (PFT) was performed. Based on questionnaires and PFT results, children were grouped as labelled and unlabelled asthmatics. Cough was found to be equally prevalent in both groups, while wheezing and shortness of breath were independent and significant factors associated with receiving a physician's diagnosis.

A general physical and systemic examination was done, followed by the pulmonary function test. Peak expiratory flow rates were measured by a Mini-Wright peak flow meter in the standing position. The best of three measurements was taken. Children who had asthma-like symptoms were subjected to spirometry examination. In conclusion, it was found that asthma is more likely to be missed or underdiagnosed in children presenting with cough without wheezing and shortness of breath.

TRICKY DIAGNOSIS

Wheezing, coughing, and other asthma-like symptoms can occur with conditions other than asthma, such as viral infections, so diagnosing asthma in young children can be really tricky. This is the reason why it may not be possible to make a definite diagnosis of asthma until the child is older.

Diagnosing the precise cause of

Asthma control is personal: what works for one child may not work for another. An allergist can create a tailored asthma management plan combining quick-relief inhalers and daily controller meds. Avoid allergens, smoke, and poor indoor air to reduce flare-ups.

asthma is sometimes difficult because two or more causes may be present in one child. Unfortunately, there is not a single test that provides all the answers. An allergist/immunologist has the specialised training and experience to determine if a child has asthma, what is causing it, and what treatment plan should be developed.

It is also important to understand what triggers the symptoms in a particular child and what (including medications) can make them go away. For this purpose, an understanding of the family history of the child and the analysis of the environment (such as smoking or pets) is useful.

For many children under age five, asthma attacks are triggered or worsened by colds and other respiratory infections. It may be noticed that a particular child's colds last longer than they do in other children, or that signs and symptoms include frequent coughing that may get worse at night.

Moreover, infants may need extra attention during the diagnostic process because asthma symptoms can be caused by many things in this age group, some of which need very different therapies. When an infant has asthma symptoms, it is sometimes called reactive airway disease.

What Triggers Asthma in Children

The two most common triggers of asthma in children are colds and allergens. After infancy, allergies become particularly important, and therefore asthmatic children should have an allergy evaluation to help diagnose and manage their asthma. Avoiding the allergens to which your child is allergic may help improve his or her asthma.

There are many risk factors for developing childhood asthma. These include nasal allergies (hay fever) or eczema (allergic skin rash), a family history of asthma or allergies, frequent respiratory infections, low birth weight, exposure to tobacco smoke before or after birth, and being raised in a low-income environment.

It is also important to know why the rate of asthma in children is gradually increasing. Some experts suggest that children these days spend too much time indoors and are exposed to more and more dust, air pollution, and second-hand smoke. Some others opine that children are not exposed to enough childhood illnesses to direct the attention of their immune system to bacteria and viruses.

Many children with asthma develop symptoms before age five, so early

diagnosis is important. There are a number of conditions that can cause asthma-like symptoms in young children. Treatment of asthma in children improves their day-to-day breathing while reducing asthma flare-ups, which further helps reduce other problems caused by asthma.

Possible signs and symptoms of asthma in children include: frequent coughing spells, which may occur during play, at night, or while laughing or crying; chronic cough; less energy during play; rapid breathing (intermittently); a complaint of chest tightness or chest hurting; a whistling sound when breathing in or out (called wheezing); see-saw motions in the chest from laboured breathing (these motions are called retractions); shortness of breath; loss of breath; tightened neck and chest muscles; and feelings of weakness or tiredness.

Managing Asthma in Children

The most important part of managing asthma in children is gaining knowledge on how and when asthma causes problems, as well as how some triggers can be avoided and when to use medications. The causes of asthma and the best treatment for one child may be quite different than for another.

To understand this phenomenon, an allergist can help develop an asthma management plan, and moreover, it is wise to share it with other caregivers. The plan outlines what medications to take, and when and how to increase the doses or add more medication, if needed. It also includes advice about when to call the physician. An asthma management plan puts the patient in control for detection and early treatment of symptoms.

Inhaled medications come as metered-dose inhalers (sometimes called pumps), nebulizer solutions (delivered as a mist by a machine), and dry powder inhalers. However, it is important to learn how to use the type of medications prescribed for a child, or they might not work well.

For older children and adults, doctors can use breathing tests (lung function tests) such as spirometry or peak flow measurement. As the child gets older, these tests may be used to help pinpoint an asthma diagnosis and track the progress of treatment. Generally, children under age five aren't able to do these tests.

Not all children have the same asthma symptoms, and these symptoms can vary from episode to episode in the same child.

If the child is older than five years, he or she may be asked to perform pulmonary function testing to learn how air flows in the lungs. Other tests that your physician may discuss with you include measures of inflammation, a chest x-ray, and tests for some of the less common causes of asthma-like symptoms.

While these are some of the symptoms of asthma in children, the doctor of a particular child should also evaluate whether any illness complicates that child's breathing. Many paediatricians use terms like "reactive airways disease" or bronchiolitis when describing episodes of wheezing with shortness of breath or cough in infants and toddlers (even though these illnesses usually respond to asthma medications).

Asthma medications include inhaled rescue medications (quick-relievers) to treat symptoms and long-term controller medicines (inhaled as well as oral) to control inflammation that commonly causes asthma. If a child's asthma is more than a rare minor problem, a controller medication will probably be prescribed.

Asthma may be chronic, but it is not a life sentence. With awareness of triggers—from cold air to indoor dust—and a clear, written management plan, both children and adults can lead active, healthy lives. The key lies in early diagnosis, seasonal precautions, and consistent use of prescribed medications. Breathe smart, and asthma loses its power.

CUTTING-EDGE BREAK-THROUGHS

Surgery remains the gold standard in cancer treatment, from diagnosis to palliation. With minimally invasive techniques like robotic surgery and laparoscopy, patients now experience faster recovery, less pain, and better outcomes.

BY TEAM DOUBLE HELICAL.

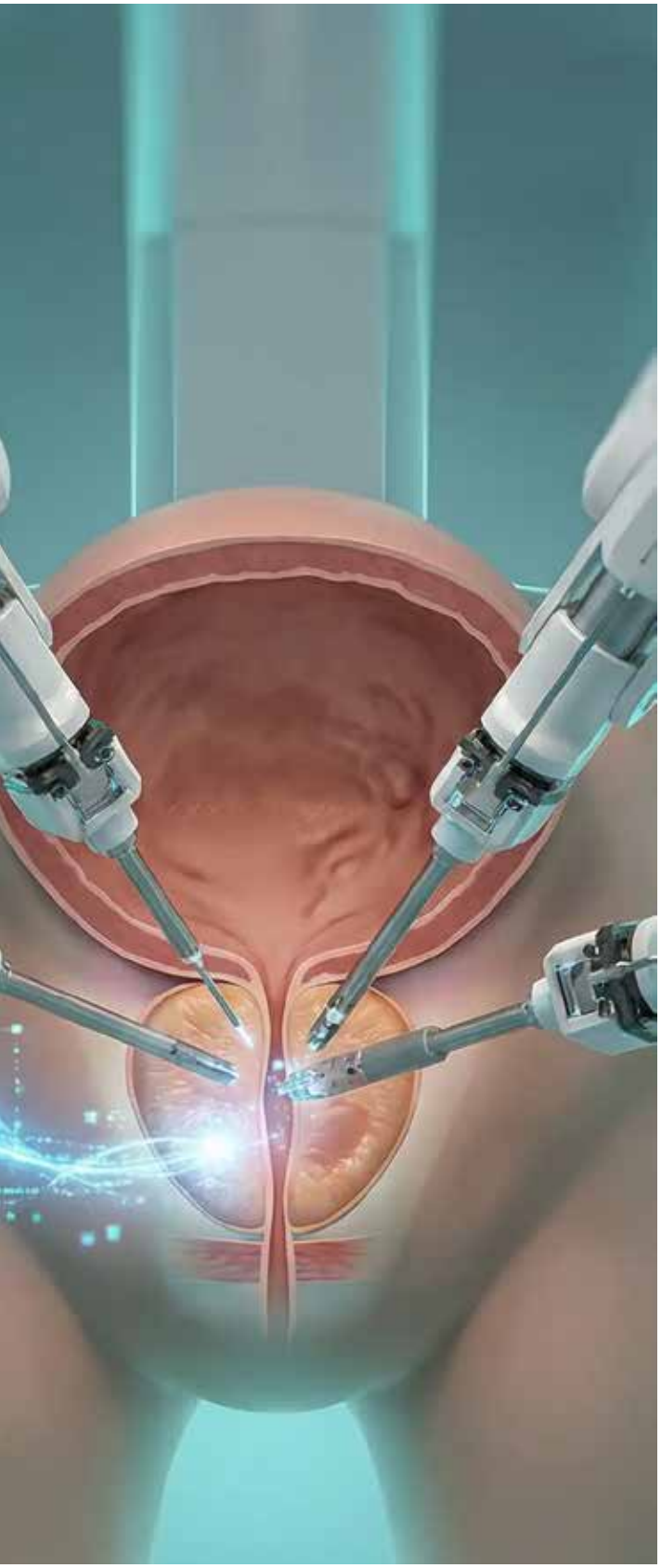
Technology is transforming the fight against cancer. With rapid advancements, surgery remains the most effective of all options available for cancer treatment. In fact, surgery has a part to play at all stages from diagnosis to palliation. Cancer surgery is a highly specialised branch requiring years of intense training, a multidisciplinary team, and good paramedical backup.

Cancer is a group of several hundred entities that can begin almost anywhere in the body. It happens when normal cells in the body change from their native state and grow uncontrollably. These cells may form a mass called a tumour. A tumour can be either malignant (cancerous, meaning it can spread to other parts of the body) or benign (noncancerous). However, some cancers do not form solid tumours. These are called haematological malignancies. They include leukaemia, most types of lymphoma, and myeloma (cancer of the plasma cells in the bone marrow, the spongy tissue inside bones).

TYPES OF SURGERY

Diagnostic: For most types of cancer, biopsy is the only way to make a definitive diagnosis. During a surgical biopsy, the surgeon makes a cut in the skin and removes some or all of the suspicious tissue. There are two main types of surgical biopsies. An incisional biopsy is the removal of a piece of the suspicious area for examination. An excisional biopsy is the removal of the entire suspicious area, such as an unusual mole or a lump.

After a biopsy, the tissue removed is examined under a microscope by a pathologist. A pathologist is a doctor who specialises in interpreting laboratory tests and evaluating cells, tissues, and organs to diagnose disease. The pathologist provides a pathology report to the surgeon or oncologist, who makes the diagnosis.



Minimally invasive surgery is revolutionising cancer care. Laparoscopy, laser surgery, cryosurgery, and endoscopy use small incisions or natural openings, cutting recovery time dramatically. Mohs surgery removes skin cancer layer by layer with microscopic precision, sparing healthy tissue.

Staging: Staging surgery is performed to find out the size of the tumour and if or where it has spread. This often includes removing some lymph nodes (tiny, bean-shaped organs that help fight infection) near the cancer to find out if it has spread there. Together with the physical examination, biopsy, and results of laboratory and imaging tests, this surgery helps the doctor decide which kind of treatment is best and predict the patient's prognosis, that is, the chance of recovery.

Tumour removal, also called curative or primary surgery: The most common type of cancer surgery is the removal of the tumour and some of the tissue surrounding the tumour. The tissue surrounding the tumour is called the margin. Tumour removal may be the only treatment, or it may be combined with chemotherapy, radiation therapy, or other treatments, which may be given before or after surgery. Conventional surgery requires large cuts, called incisions, through skin, muscle, and sometimes bone. However, in some situations, surgeons can use less invasive techniques, which may speed up recovery and reduce pain afterwards.

Debulking: When complete removal of a tumour is not possible or might cause excessive damage to the body, surgery is used to remove as much of the tumour as possible. Other treatments, such as radiation therapy or chemotherapy, may sometimes also be used to shrink the remaining cancer.

Palliation: Palliative surgery is used to relieve side effects caused by a tumour. It plays an important role in improving quality of life for patients with advanced cancer or widespread disease. Surgery may be used to help relieve pain or restore physical function if a tumour presses on a nerve or the spinal cord, blocks the bowel or intestines, or creates pressure or blockage elsewhere in the body. Surgery may be used to help stop bleeding. When surgery is needed to stop bleeding, a common technique is suture ligation, which involves tying blood vessels using surgical thread. Surgery may also be used to insert a feeding tube or tubes that deliver medications, or to prevent broken bones by inserting a metal rod into weakened bones.

Reconstruction: After primary cancer surgery, surgery may be an option to restore the body's appearance or function. This is called reconstructive or plastic surgery. Reconstructive surgery may be done at the same time as tumour removal, or later after a person has healed

or received additional treatment. Examples include breast reconstruction after a mastectomy and surgery to restore appearance and function after head and neck cancer surgery.

Prevention: Some surgery is performed to reduce the risk of developing cancer. For example, doctors often recommend the removal of precancerous polyps in the colon to prevent colon cancer. In addition, women with a strong family history of breast or ovarian cancers or known mutations to the BRCA1 and BRCA2 genes may decide to have a mastectomy (removal of the breast) or an oophorectomy (removal of the ovaries) to lower their future cancer risk.

Types of Minimally Invasive Surgery

As mentioned above, conventional surgery often requires large incisions. However, in some situations, surgery can be performed through one or more small incisions, which typically results in shorter recovery times and less pain afterwards. Minimally invasive surgery is in increasing demand these days, but it is a highly specialised field.

Below are some examples of minimally invasive procedures and surgeries:

Laparoscopic surgery: The doctor performs surgery through small incisions in the skin using a thin, lighted tube with a camera. Laparoscopy refers to minimally invasive surgery of the abdomen, while mediastinoscopy and thoracoscopy are terms used when the same type of procedure is performed in the chest.

Laser surgery: The doctor uses a narrow beam of high-intensity light to remove cancerous tissue.

Cryosurgery: The doctor uses liquid nitrogen to freeze and kill abnormal cells.

Mohs micrographic surgery (also called microscopically controlled surgery): The dermatologist shaves off a skin cancer, one layer at a time, until all cells in a layer appear normal when viewed under a microscope.

Robotic Surgery: This is the latest minimally invasive technique in cancer surgery, in which the operating surgeon uses a robotic system to perform the surgery. The surgeon sits comfortably at a console at some distance while the robot performs the operation based on the surgeon's instructions. This system has several advantages, including better magnification, greater degrees of movement, 3D vision, and faster rehabilitation. However, the steep cost is the limiting factor.

Endoscopy: The doctor inserts a thin, flexible tube with a light and camera on the tip (called an endoscope) into an opening of the body (such as the mouth, rectum, or vagina) to examine internal organs. During an endoscopic procedure, it is possible to remove samples of potentially abnormal tissue for further examination.

ROLE OF SURGERY

Surgery is the removal of the tumour and surrounding tissue during an operation. A doctor who specialises in the surgical treatment of cancer is called a surgical oncologist. Surgery is the oldest type of cancer therapy and remains an effective treatment for many types of cancer today. The goals of surgery vary. It is often used to remove all or some of the cancerous tissue after diagnosis.

Not all surgeries are the same. Diagnostic biopsies confirm cancer, staging maps its spread, curative removal extracts the tumour, debulking reduces mass when full removal is risky, palliative surgery eases suffering, and reconstructive surgery restores form and function. Each type serves a unique, life-saving purpose.

However, it can also be used to diagnose cancer, find out where the cancer is located, whether it has spread, and whether it is affecting the functions of other organs in the body. In addition, surgery can be helpful to restore the body's appearance or function or to relieve side effects.

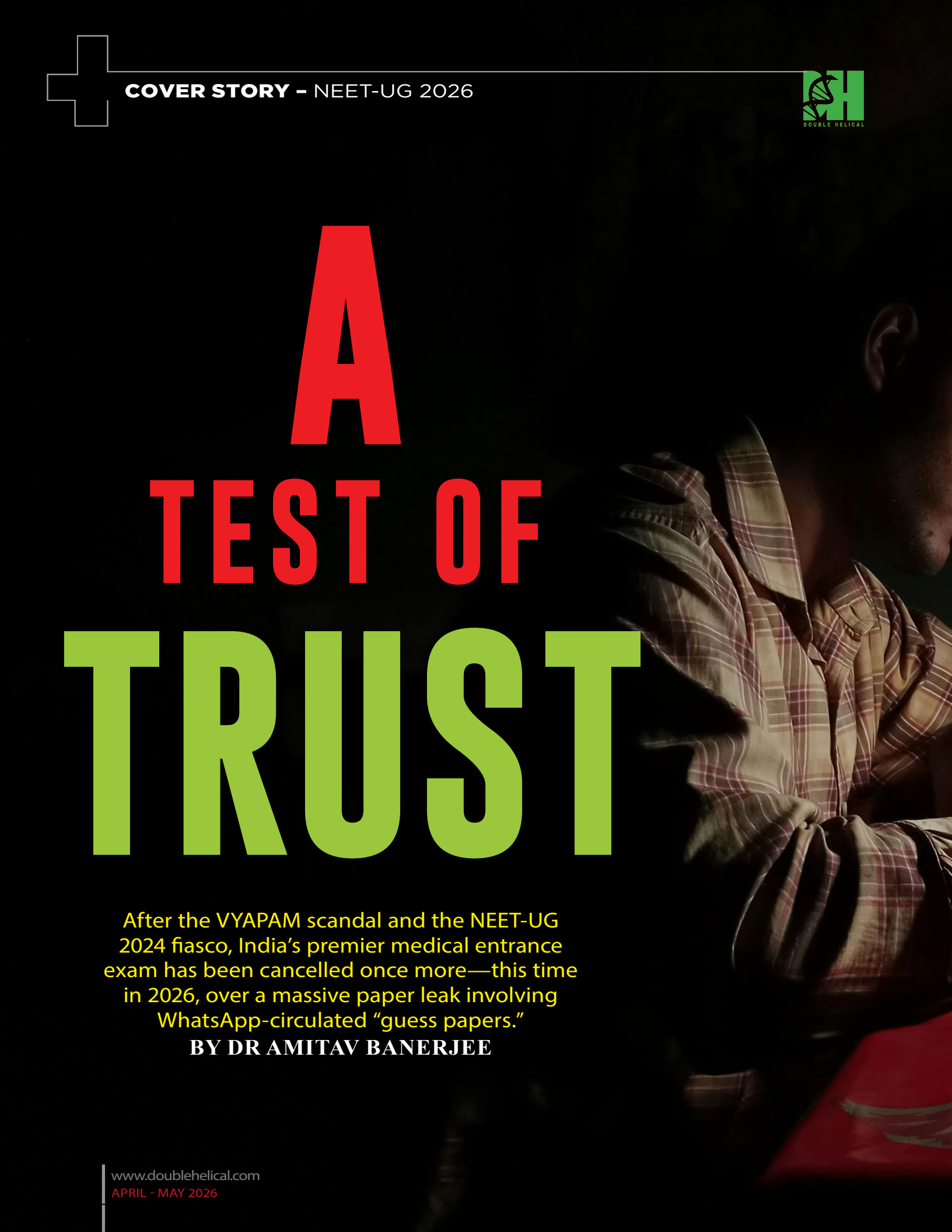
The location of surgery depends on the extent of the procedure and how much recovery is needed. Surgery may be performed in a doctor's office, clinic, surgical centre, or hospital. Outpatient surgery means no overnight hospital stay before or after surgery. Inpatient surgery means a hospital stay overnight or longer to recover after surgery.

The diagnosis of cancer begins when a person reports any unusual symptoms. After discussing a person's medical history and symptoms, the doctor will perform various tests to find out the cause of the ailment. However, many times a person with cancer has no symptoms. Sometimes a doctor diagnoses cancer after a screening test in an otherwise healthy person. Examples of screening tests include colonoscopy, mammogram, and Pap test.

For most cancers, a biopsy is the only way to make a definitive diagnosis. The cancer treatment options that the doctor recommends depend on the type and stage of cancer, possible side effects, and the patient's preferences and overall health. In cancer care, different doctors often work together to create a patient's overall treatment plan that combines different types of treatment. This is called a multidisciplinary team.

From diagnosis to recovery, surgery is an indispensable pillar of cancer care. The advent of robotic systems, laparoscopic tools, and other minimally invasive techniques has made treatment gentler and more precise than ever. While challenges like cost remain, the trajectory is clear: technology continues to give patients and surgeons powerful new weapons against cancer.

A TEST OF TRUST



After the VYAPAM scandal and the NEET-UG 2024 fiasco, India's premier medical entrance exam has been cancelled once more—this time in 2026, over a massive paper leak involving WhatsApp-circulated "guess papers."

BY DR AMITAV BANERJEE

Rajasthan Police's Special Operations Group uncovered a 150-page handwritten PDF containing roughly 410 questions, of which 120 matched the actual NEET-UG 2026 paper. The leak began circulating on encrypted messaging apps up to a month before the exam, sold for ₹30,000 to ₹5 lakh.

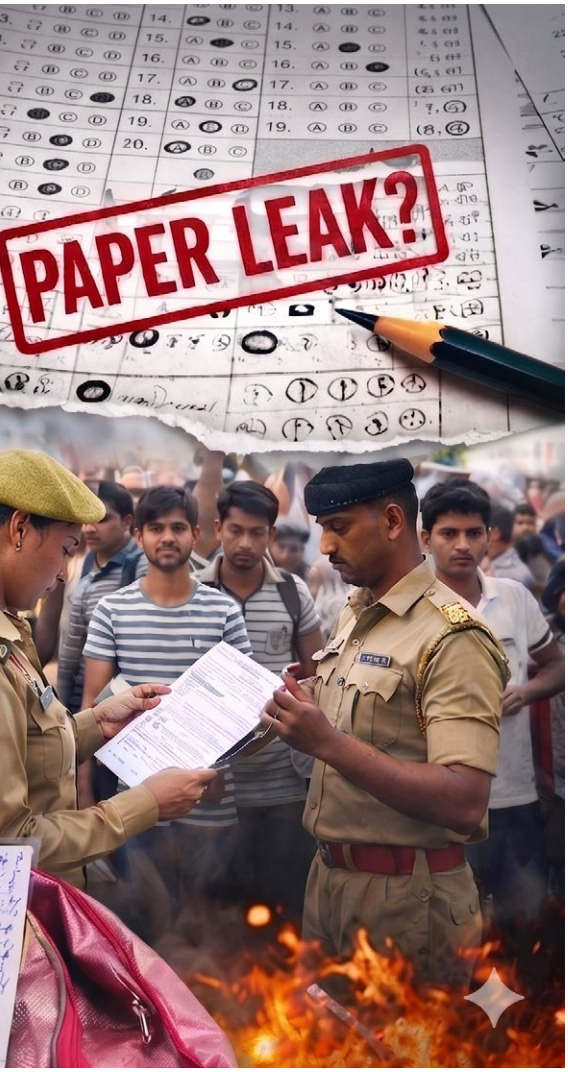
After years of gruelling hard work and sacrifice in the prime of their lives, our youth deserve a level playing field in highly competitive entrance examinations like the National Eligibility-cum-Entrance Test for undergraduate MBBS courses (NEET-UG). Transparency and efficiency in the conduct of NEET will not only do justice to their hard work but will also set an example in integrity and values—qualities so essential for those aspiring to enter a noble profession which, traditionally, was a calling. A clean system of entrance examinations will also ensure that only the best and brightest with high moral values enter the demanding vocation.

Unfortunately, the reality is far from this ideal. Since medicine continues to be the first career choice for aspiring youth, there is a great mismatch between demand and supply. Over 22 lakh students compete for around 1.3 lakh seats, only about half of which are subsidised government seats affordable to students of modest means. This is exploited at all levels, with the mushrooming of coaching classes driving strenuous, nerve-wracking preparation for the entrance examination. Kota has become the epitome of the coaching culture for aspiring youth. On a much darker note, it has also been hitting the headlines for frequent, tragic suicides of young people cracking under the pressure.

The recent news of the 2026 NEET-UG being cancelled due to paper leaks indicates that the lessons have not been learned from past scams related to entrance examinations to medical courses in the country.

FROM STATE-LEVEL CORRUPTION IN MEDICAL ENTRANCE TESTS, THE MALAISE HAS REACHED THE NATIONAL LEVEL

Over a decade ago, in 2013, the state of Madhya Pradesh was rocked by the



VYAPAM scam. The acronym VYAPAM stands for Vyavsayik Pariksha Mandal (the Madhya Pradesh Professional Examination Board, or MPPEB). This was a fraud that hit the headlines, dealing a big blow to the credibility of entrance examinations for professional colleges in the state. The main highlights of the scandal were:

- Irregularities were discovered in the Pre-Medical Test (PMT) conducted by VYAPAM.
- It came to light that the scam had been going on for several years.
- The scam involved a number of middlemen, candidates, and officials who colluded to manipulate exam results, facilitate impersonation, and secure admission to government medical colleges by unfair means.
- High-profile arrests — The investigation led to the arrest of several high-profile individuals, including politicians, government officials, and education professionals. A few political leaders and bureaucrats were also named as accused.
- The extent of the scam was vast; thousands of candidates were part of the irregularities.
- Mysterious deaths and speculations — The Vyapam scam gained notoriety for a number of mysterious deaths among the accused, witnesses, and whistleblowers. The circumstances surrounding these raised concerns and controversies.
- CBI and Special Task Force (STF) investigation — The scam was investigated by several agencies, including the CBI and STF, leading to arrests, charge sheets, and court cases.
- Convictions — A number of individuals were convicted for their roles, while many were acquitted due to lack of evidence.
- A large number of mysterious deaths among witnesses and whistleblowers might have silenced many who would otherwise have come forth to testify. This raises genuine concerns that many key players may have been acquitted.

INSTITUTIONAL FAILURE AND THE "SHADOW OF 2024"

Just over a decade after the VYAPAM scam in Madhya Pradesh, irregularities in medical entrance manifested at the national level in NEET-UG 2024.

The 2024 NEET-UG controversy represents one of the most significant crises in the history of Indian competitive examinations. For nearly 2.4 million medical aspirants, the exam is a high-stakes gateway to their future; however, the events of 2024 cast a long shadow over the integrity of the National Testing Agency (NTA) and the meritocratic ideals of the nation.

THE GENESIS OF THE CONTROVERSY

The issue began shortly after the exam was conducted on May 5, 2024. While the NTA initially dismissed social media reports of paper leaks, investigations by the Economic Offences Unit (EOU) in Bihar and raids in Godhra, Gujarat, uncovered evidence of localised malpractices.

In Patna, several individuals were arrested for allegedly receiving the question paper and solved answers a day before the exam for sums ranging from ₹30 lakh to ₹50 lakh. Meanwhile, in Gujarat, a deputy superintendent of an exam centre was accused of aiding students by promising to fill in their blank OMR sheets.

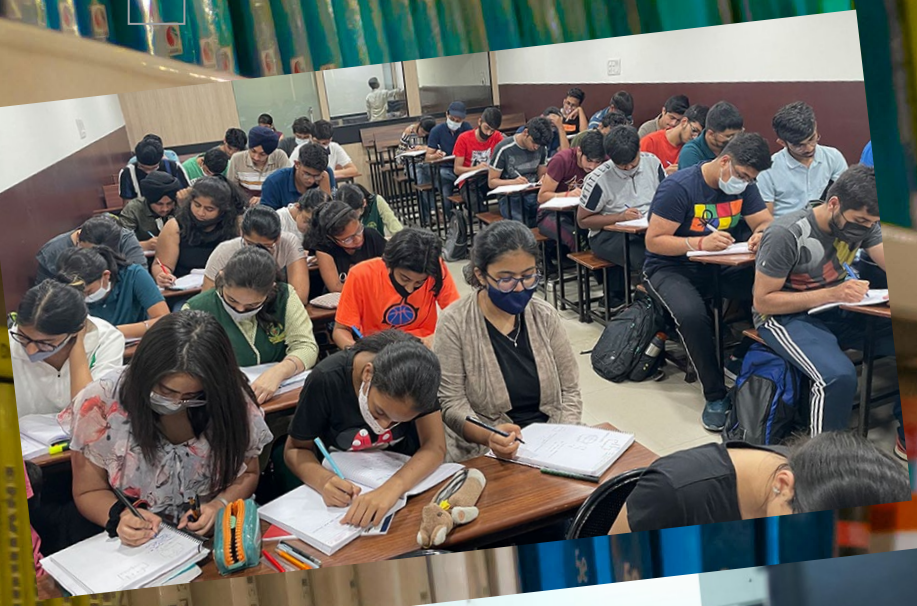
STATISTICAL ANOMALIES AND "IMPOSSIBLE" SCORES

The situation reached a boiling point when the results were released on June 4, 2024 — the same day as the general election results. Several "red flags" emerged:

- Unprecedented Toppers: An astounding 67 students achieved a perfect score of 720/720. In previous years, this number rarely exceeded three or four.
- Mathematical Impossibilities: Some candidates received scores of 718 or 719. Given the NEET marking scheme, these scores are mathematically impossible unless "grace marks" are applied.
- Localised Clusters: Multiple top-rankers had appeared for the exam at the same centres, notably in Haryana, fuelling suspicions of systemic collusion.

THE GOVERNMENT AND NTA's RESPONSE

The NTA initially defended the results,



attributing the high scores to a "comparatively easier" paper and the awarding of grace marks to 1,563 candidates who suffered "loss of time" during the exam. However, as public outcry and protests intensified, the Union Education Ministry admitted to "institutional failures."

KEY ACTIONS TAKEN INCLUDED:

1. Re-test: The Supreme Court oversaw a re-exam for the 1,563 students who received grace marks.
2. CBI Probe: The investigation was handed over to the Central Bureau of Investigation (CBI) to determine the extent of the leak.
3. Structural Reform: The government removed the NTA Director General and formed a high-level committee, led by former ISRO chairman Dr K. Radhakrishnan, to recommend reforms for the agency.
4. Legislative Action: The government notified the Public Examinations (Prevention of Unfair Means) Act, 2024, which carries a maximum penalty of 10 years in prison and a ₹1 crore fine for organised cheating.
5. AI-assisted CCTV monitoring and


Principles of
ENVIRONMENTAL
SCIENCE

5G signal jammers.

6. GPS-tracked transportation of question papers with unique watermarks.
7. Multi-stage biometric verification of all candidates.

Despite these high-tech interventions, the 2026 incident suggests that the vulnerability may lie in the human element of the supply chain rather than in digital security. The fact that a "guess paper" could mirror nearly 600 marks' worth of the exam suggests a systemic breach of the question bank itself, rather than a last-minute leak from an exam centre.

THE CIRCUMSTANCES OF THE 2026 BREACH

The recent developments surrounding NEET-UG 2026 have once again cast a long shadow over India's medical education system. On May 12, 2026, the NTA took the major step of cancelling the examination conducted on May 3, following substantial evidence of a question paper leak. This decision, affecting nearly 22.8 lakh students, marks a critical failure in the safeguards intended to protect the aspirations of India's youth.

The scandal originated from findings by the Rajasthan Police Special Operations Group (SOG). Investigators uncovered a handwritten "guess paper" — a PDF document of roughly 150 pages — containing about 410 questions.

- The Overlap: Approximately 120 questions (predominantly in the Biology and Chemistry sections) were found to be identical or significantly similar to the actual NEET-UG paper.
- The Timeline: Evidence suggests this material began circulating on WhatsApp and encrypted messaging apps as early as 15 to 30 days before the exam.
- The Investigation: Traces of the leak led to a network involving a medical student in Kerala and coaching hubs in Sikar, Rajasthan. The document was reportedly sold

for sums ranging from ₹30,000 to ₹5 lakh.

SOCIO-ECONOMIC AND PSYCHOLOGICAL IMPACT

For the 22 lakh aspirants, the cancellation is more than a logistical hurdle; it is a profound psychological blow.

- The Coaching Economy: Many students from modest backgrounds spend years in coaching hubs like Kota and Sikar, often funded by life savings or loans. A re-examination forces families to bear additional travel and stay costs.
- Erosion of Trust: When the primary gateway to a medical career is repeatedly mired in scandal, it creates a "meritocracy crisis." Honest students begin to feel that the system favours those with the financial means to buy leaked papers rather than those with the dedication to study.

For over 22 lakh students—many from modest backgrounds, funded by loans and years in Kota's coaching factories—the cancellation is a profound psychological and financial blow. Honest aspirants face resurgent fears that merit no longer matters.

THE WAY FORWARD

The government has now referred the matter to the CBI for a comprehensive probe. While a re-test is necessary to maintain the integrity of the medical profession, it remains a "band-aid" solution to a structural wound.

Moving forward, the debate has shifted toward more radical reforms, such as:

1. Transitioning to Computer-Based Testing (CBT): Moving away from the pen-and-paper format to minimise physical handling of papers.
2. Decentralisation: Re-evaluating the "one nation, one exam" model to reduce the impact of a single point of failure.
3. Legal Accountability: Implementing the strictest possible penalties under the new anti-paper leak laws to deter organised "solver gangs."

BOTTOM LINE

The 2026 NEET leak is a sobering reminder that technology cannot substitute for institutional integrity. As the country prepares for a re-examination, the focus must remain on ensuring that the future of India's healthcare is not auctioned off to the highest bidder. Protecting the sanctity of this exam is not just about medical admissions; it is about restoring the faith of an entire generation in the fairness of the Indian state.

(The author is a renowned epidemiologist and Professor Emeritus at D. Y. Patil Medical College, Pune. Having served as an epidemiologist in the armed forces for over two decades, he has ranked in Stanford University's list of the world's top 2 per cent of scientists for three consecutive years (2023-25). He has over three decades of experience as a medical teacher. He is Chairperson of the Universal Health Organization, a public health watchdog: uho.org.in)


COVID-19 TEST
POSITIVE
NEGATIVE
COVID-19 TEST
POSITIVE
NEGATIVE
COVID-19
Vaccine
2019-nCoV
Injection Only.
COVID-19
COVID-19

STUMPED BY THE BOOSTER!

With Jackson, son of Australian cricket legend Shane Warne, blaming the COVID-19 vaccine for precipitating his father's death, reports of sudden cardiac events, strokes, and unexplained excess mortality recorded across the globe since the mass rollout of COVID-19 vaccines in 2021 cannot be brushed under the carpet.

BY DR AMITAV BANERJEE

Shane Warne, the world-famous Australian cricketer, died suddenly of a heart attack while holidaying in Thailand on March 4, 2022. He lived life "king-sized," both on and off the field.

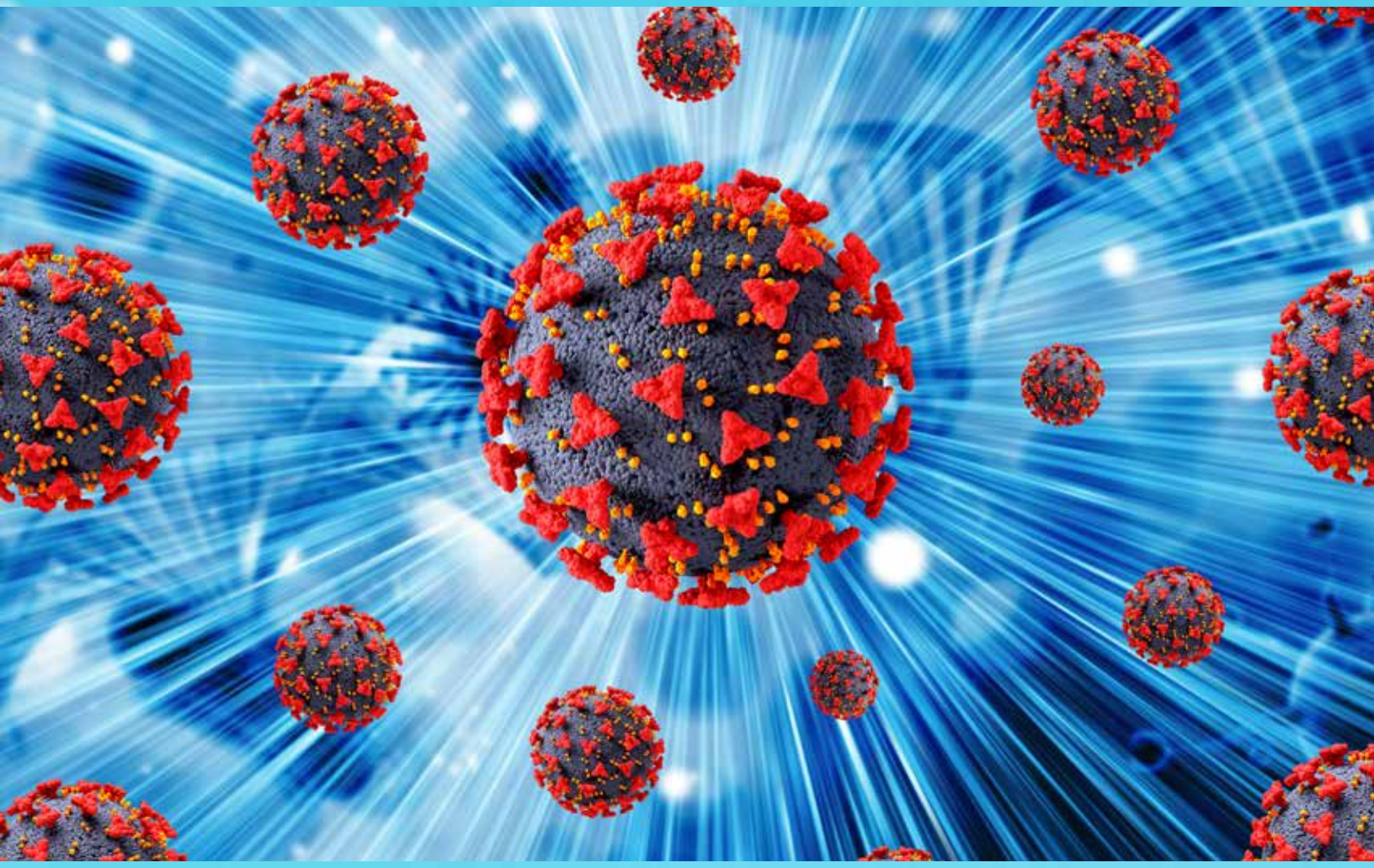
He was regarded by connoisseurs of the game as one of the greatest leg spinners, with 145 Test appearances, 708 wickets, and over 3,000 runs as a lower-order batsman. In a country where cricket culture favoured pace bowlers, Shane Warne revolutionised the game by reviving the masterly art of leg-spin bowling. He can be easily compared to Indian spin legends such as Prasanna, Bedi, Venkatraghavan, and Chandrasekhar, among others.

In his heyday, Warne hit the headlines for his antics both on and off the field. These included a ban from cricket for testing positive for a prohibited drug, a colourful personal life, and hobnobbing with gambling figures. He was also a smoker and did drink alcohol. However, his manager cleared the air, stating that prior to his untimely death at the age of 52 years, he was not drinking nor taking any drugs. He was on a weight-loss diet to get in shape. James Erskine, his manager, added that he was on a much-needed vacation in Thailand, after which he was scheduled to travel to England for his professional commitments. He emphasized that contrary to popular opinion, Shane was not a heavy drinker, noting that a crate of wine gifted to him 10 years earlier remained unopened.

CONTROVERSY OVER SHANE WARNE'S DEATH

Shane Warne, whose life was full of controversies, seems to have his share of them after death as well. A report which surfaced on March 30, 2025, quoted a police officer saying that a bottle of a drug from the site was removed on the orders of some senior people. While a heart attack was cited

> **Even if underlying health issues were present, the "pitch" of potential vaccine-induced cardiac events cannot be ignored when analysing sudden deaths in the vaccinated.**



as the reason for his demise, this revelation sparked fresh controversy. One of the officers investigating the case said an Indian drug may have contributed to his death. This drug, Kamagra—which contains similar ingredients to Viagra and is indicated for erectile dysfunction—was found in his room. However, an autopsy suggested that the cricketer died of natural causes, ruling out the possibility of any conspiracy or drug reaction.

Just when the dust seemed to have settled on the unfortunate event, Warne's son, Jackson, stated in a recent podcast from Australia that his father's death was probably precipitated by the three or four COVID-19 jabs he was forced to take against his will due to vaccine mandates.

He went so far as to say that this line of thinking is not controversial anymore. Perhaps reports from around the world of rising cardiac and vascular events after population-level mass vaccine rollouts made him think along these lines.

While Jackson admitted that his father had underlying health issues, he asserted that the jabs contributed to the sudden death. What makes the unfortunate and untimely death more poignant (in case the vaccine was responsible) is that Shane Warne had recovered from COVID-19 before taking the shots. By all principles of immunology and current evidence, the jabs were not indicated.

Like a pitch in cricket, deaths in the vaccinated cannot be squarely blamed on comorbidities, if present. Drawing from cricketing logic, the pitch plays an important part in the outcome of the game, particularly in Test matches—Warne's forte. Dry, dusty, and well-worn pitches favour spin bowling, in which Warne excelled. He could bowl out many batsmen on such pitches compared to, for instance, a mediocre bowler on the same pitch.

Now drawing on this analogy from cricket, even if Shane Warne had comorbidities, an intervention with the potential for harm would cause more damage and precipitate catastrophe

compared to no intervention or a bland product. Likewise, just because a person has comorbidities, it should not naturally follow that an intervention with potential for harm had no role in a fatal outcome. On the contrary, a potentially harmful intervention may be more likely to cause harm in a comorbid heart, just like a spinner is more deadly on a dry and dusty pitch. Having said this, it does not naturally follow that the vaccine caused the death of the legendary cricketer. Life, like cricket, often deceives due to the vagaries of chance. For example, even a good spinner may go wicketless on a dry pitch on a bad day. That is why we have to look beyond an individual unfortunate event—even that of a celebrity—to look at the big picture to make an intelligent guess.

Global patterns of deaths after the mass vaccine rollout present some red flags. Reports of people—both healthy and with comorbidities—suddenly collapsing and dying require investigation to determine if there is any correlation with vaccines or something else. Since the mass COVID-19 vaccine rollout, a spike in cases of sudden heart attacks, cardiac arrests, and other cardiovascular complications among all age groups has been reported from across the country; even seemingly fit people have died of cardiac health issues while walking on the street, on the dance floor, and even while just sitting at a desk.

A year into the mass vaccine rollout in India, according to a survey by LocalCircles (a social community platform), 51 per cent of the respondents said they knew one or more persons who had suffered heart attacks, strokes, sudden cancers, or neurological disorders in the recent past. Out of those who experienced such events, 62 per cent of the cases were found to have been double-vaccinated, 11 per cent had received a single dose, and 8 per cent were unvaccinated.

Science demands a detached view, and scientists should not jump to conclusions. One of the requirements for this is discerning any unusual patterns at the population level. This does indicate some cause for concern. The increase in sudden deaths has been reported since early 2021; there was a sixfold increase in heart attacks reported from Mumbai.

The pattern of excess deaths was not, however, restricted to India, but was global. Here we take a close look at two countries from where open data

From a six-fold increase in heart attacks in Mumbai to a 17.2 per cent rise in mortality in Australia, the data presents a series of red flags that demand an objective, scientific investigation.

is available: England/Wales and Australia.

In England and Wales, the year 2020 saw an increase of about 13 per cent in overall mortality over the average of the previous five years. What is striking is that even in 2022, after the brunt of the pandemic was over, there was significant excess mortality of about 8 per cent over the 2015-2019 average.

The case of Australia, Shane Warne's native country, is even more striking, as the country followed a "zero-COVID" policy for a long time, with strict lockdowns as well as coercion and mandates for COVID-19 vaccines. By the start of 2022, it had vaccinated the majority of its population and even booster doses were made available.

The baseline average deaths in the first eight months of the year were just 110,483, while the total deaths in the first eight months of 2022 were 129,513. This represents a 17.2 per cent increase above baseline—even higher than the excess deaths caused by COVID-19 in 2020 in England & Wales.

Edward Dowd, in his book Cause Unknown: The Epidemic of Sudden Deaths in 2021 and 2022, reports an 84 per cent rise in sudden deaths in the age group of 25–44 years in the USA, coinciding with mass vaccine mandates, which was corroborated by a study of insurance claims.

There are two possible causes for the high excess mortality worldwide. First, these could be the prolonged effects of harsh lockdowns. After all, lockdowns have directly increased diabetes, obesity, starvation, poverty, joblessness, vitamin D deficiency, and the propensity for cancer. A second cause could be the excessive use of COVID-19 vaccines—even among the already COVID-recovered (including Shane Warne) and among the not-at-risk population—without adequate safety data.

The time correlation of heart

illnesses with the COVID-19 jab rollout is unmistakable in the worldwide data. While correlation does not mean causation, it certainly is a red flag which must be probed objectively.

A matter of concern is that during the US Senate's Permanent Subcommittee Hearings on COVID-19 vaccines on May 21, 2025, Dr Peter McCullough, a cardiologist, presented findings from a large autopsy series. He stated that in 73.9 per cent of examined post-vaccination deaths, mRNA COVID vaccines were considered the likely cause—a claim that has sparked intense debate in the medical community.

Given our large population, our data dividend can be a source of robust research by using big data mining to find the patterns of events in the vaccinated and the unvaccinated. These can be corroborated by autopsy studies. In detective work, nothing is above suspicion. Shooing away the possibility of the vaccine being responsible for an adverse event whenever any comorbidity is found is not the correct approach in science nor in detective work.

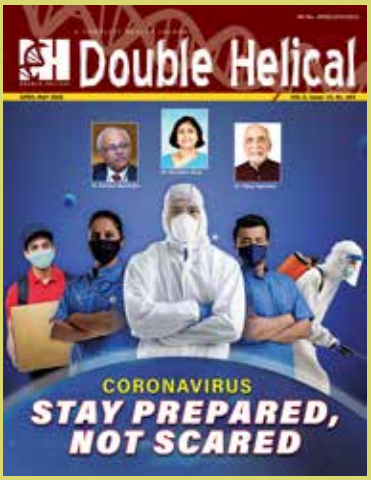
BOTTOM LINE

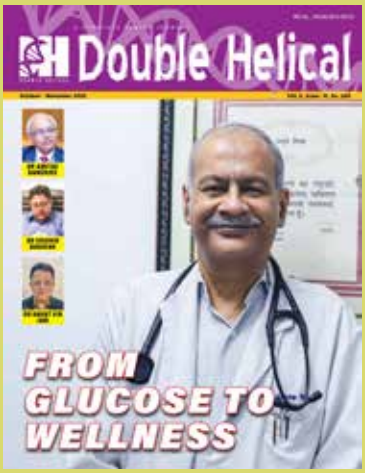
Pandemics and wars have much in common. Both are messy and do not turn out according to neat plans. Weapons malfunction in wars; vaccines malfunction in pandemics. Pandemics should never be tackled in "war mode" but in a scientific way. All options should be considered, however far-fetched they may appear. Debate and disagreements strengthen science. Regrettably, these were discouraged during the pandemic, which was approached with warlike urgency.

Lastly, did the COVID-19 vaccine precipitate the death of the legendary cricketer? There are no easy answers. Both yes and no can be the correct answer. Even the best detective fails to solve all cases. But one thing is certain: having recovered from natural infection, the COVID-19 vaccine was not indicated for Shane Warne.

(The Author is a renowned epidemiologist and a Professor Emeritus at DY Patil Medical College, Pune. Having served as an epidemiologist in the armed forces for over two decades, he ranked in Stanford University's list of the world's top 2 per cent scientists for three consecutive years (2023-25). He has penned the book, Covid-19 Pandemic: A Third Eye. He is the Chairperson of the Universal Health Organization (uho.org.in), a public health watchdog.)

Your Guide to Healthy Living





Subscribe to Double Helical Magazine Now

Subscription Offer

Duration (year)	Issue	Newsstand Price INR	Subscription Price INR	Savings Price INR
1	12	1800	2600	200
2	24	3600	3200	400
3	36	5400	5000	400

Please fill this form in Capital Letters

First Name..... Last Name .....

Designation/Profession..... .....

Mailing Address..... .....

City..... Postal Code.....

State..... Count ry.....

Telephone..... Fax.....

Email..... Website.....

I/We would like to subscribe for 1 ☐ 2 ☐ 3 ☐ Year

I am encloing a cheque/DD No. ..... Drawn on ..... (Specify Bank)

Dated..... .....In favour of Double Helical Pvt. Ltd. payable at

Ghaziabad For Rs .....only

Advertisements & Marketing
Abhinav Kumar
Email: **sales**@doublehelical.com

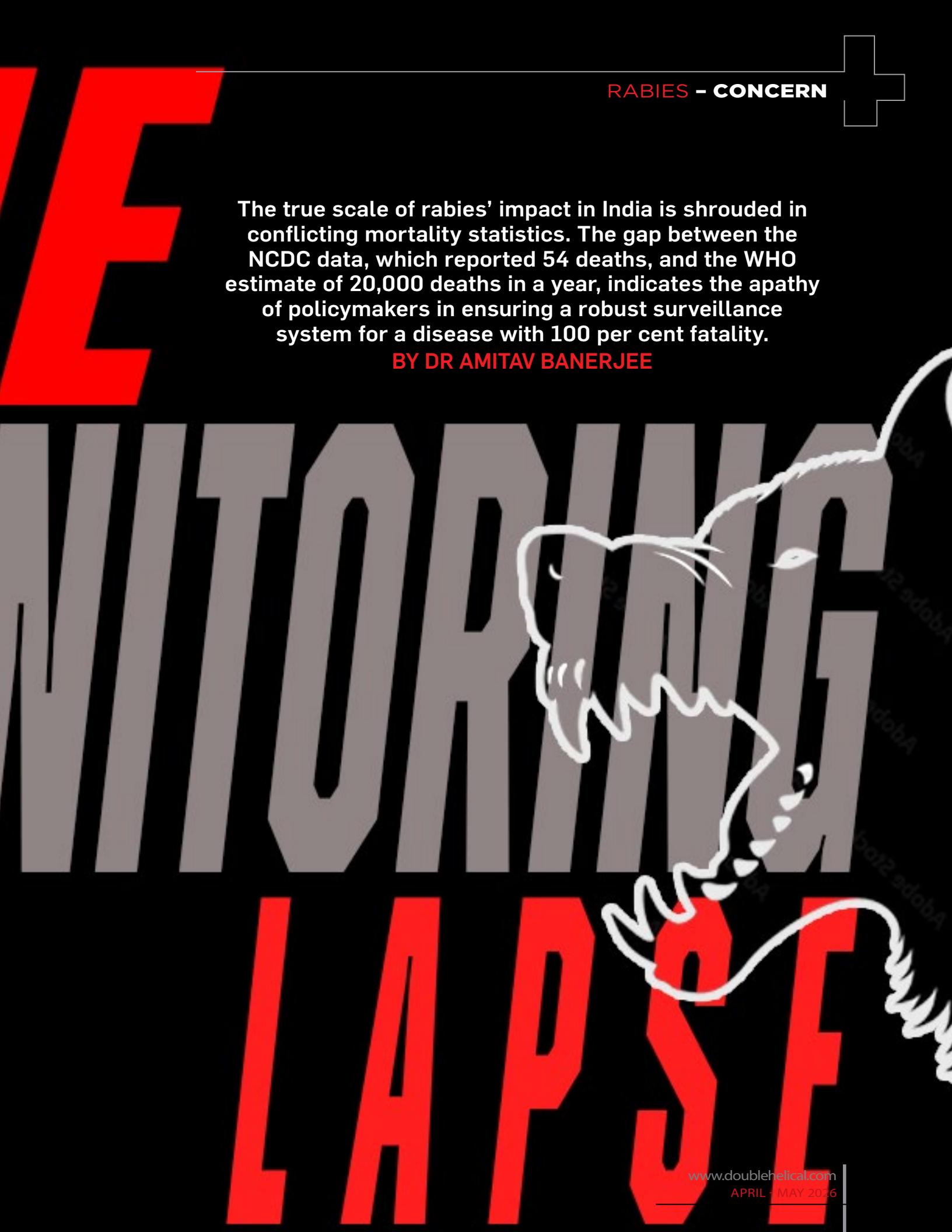
Double Helical is owned, printed and Published monthly. It is printed at Polykam offset, Naraina Industrial Area Phase 1, New Delhi-110028, and published from G-1, Antriksh Green, Kaushambi, Ghaziabad-201 010. Tel: 0120-4219575, 9953604965.
Contact us:**contact**@doublehelical.com
Email: **editor**@doublehelical.com, **doublehelicaldesign**@gmail.com
Website: www.doublehelical.com, www.doublehelical.in

TH
MO

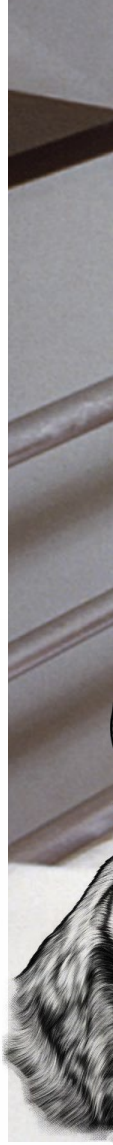
E MONITORING LAPSE

The true scale of rabies' impact in India is shrouded in conflicting mortality statistics. The gap between the NCDC data, which reported 54 deaths, and the WHO estimate of 20,000 deaths in a year, indicates the apathy of policymakers in ensuring a robust surveillance system for a disease with 100 per cent fatality.

BY DR AMITAV BANERJEE



Rabies, known as hydrophobia (fear of water), is a fatal zoonotic disease of the central nervous system, caused by a virus belonging to the family Lyssavirus Type 1. The transmission of the virus is sustained among warm-blooded animals, mostly carnivorous such as dogs, cats, jackals, and wolves. Bat rabies is a concern in some regions of the world. Man gets infected by bites or licks from rabid animals. The disease has a long and variable incubation period, a short spell of illness due to encephalomyelitis terminating in death, despite intensive care. It has a fatality rate of 100 per cent. The patient is hyperactive, hypersensitive and conscious throughout, making the end most painful and tragic.



EPIDEMIOLOGY

The main reservoir of the deadly rabies virus is in wildlife. This makes eradication impossible. Natural geographical boundaries and strict control of the entry of infected animals have sustained rabies-free status in some island nations such as Australia, Taiwan, Cyprus, Iceland, Ireland, Japan, Malta, New Zealand and the UK, among some others.

In India, the Union Territory of Lakshadweep and the Andaman and Nicobar Islands are rabies-free.

While wildlife maintains the reservoir of the virus, the source of infection with the rabies virus is from dogs in 99 per cent of human infections. Children are more vulnerable to dog bites and rabies.

The incubation period, the time lapse between the dog bite and the onset of symptoms, shows wide variations. It is usually 1–3 months but may range from seven days to years. It is shorter in extensive bites on the face, head, neck and upper extremities and bites from wild animals.

Once the virus gains entry, it multiplies in muscle or connective tissue at the site of the bite before it attaches to nerve endings and travels via the peripheral nerves to the central nervous system.

POST-EXPOSURE PROPHYLAXIS – WOUND CARE AND FIRST AID

First aid after an animal bite is most crucial in the prevention of rabies. It should be prompt and thorough since once the virus lodges to the peripheral nerve cells, the course to fatality is irreversible. It is a medical emergency and involves local wound treatment and the administration of rabies immunoglobulin and a course of vaccine when indicated.

The local treatment of the bite is of utmost importance to remove as much of the virus as possible from the site before it attaches to the nerve endings. Immediate flushing and washing of the wound and surrounding areas is urgently indicated using plenty of soap and running water. This should continue for at least 15 minutes. Unfortunately, this first aid is often delayed or denied. Following the wash, the application of alcohol or a 0.01 per cent solution of iodine or povidone iodine acts as a virucidal agent. Suturing of the wound should be avoided. Antibiotics and anti-tetanus toxoid should follow the local treatment.

Rabies immunoglobulin for passive immunisation is administered only once, preferably at, or as soon as possible after, the initiation of post-exposure vaccination. Beyond the seventh day after the first dose of rabies vaccine, immunoglobulin is not indicated because an active antibody response is expected to have occurred

from the vaccine.

RABIES VACCINES

The current generation of rabies vaccines are purified cell-culture vaccines (CCV) and embryonated egg-based vaccines (EEV). The dose and schedule depend on the category of exposure:

- **Category 1** exposure consists of touching, feeding of animals, or licks on intact skin. Vaccine is not indicated.
- **Category 2** exposure is licks over broken skin, minor scratches or abrasions without bleeding. These need immediate vaccination and local treatment of the wound.
- **Category 3** exposures are single or multiple bites or scratches, licks on broken skin, contamination of mucous membranes with saliva from licks, and contacts with bats. These types of exposure call for immediate vaccination and administration of rabies immunoglobulin after local wound treatment.

Robust surveillance and reliable data on rabies are urgently required for our country before we contemplate any future drastic strategy at huge investments such as the universal roll-out of pre-exposure prophylaxis by including rabies vaccine in the Universal Immunisation Program.

CONTRADICTORY FIGURES OF RABIES DEATHS IN INDIA

For a disease with 100 per cent fatality, one would have presumed that we would be having accurate figures about it at the national level. Surprisingly, the estimates of deaths from rabies in India vary drastically.

- **Official NCDC Data:** The National Centre for Disease Control (NCDC) reported 54 suspected human rabies deaths in 2024, alongside over 3.7 million dog bite cases.
- **ICMR Study (2025):** A recent

ICMR study suggests a lower—but more realistic—estimate of over 5,700 annual deaths.

- **WHO Estimates:** India has been cited as having up to 20,000 deaths annually, which is often quoted to highlight the massive burden.
- **Rising Death Trends:** Despite some figures showing lower numbers, official parliamentary replies in 2025 noted a steep rise in recorded rabies deaths, increasing from 22 in 2022 to 180 in 2024, highlighting extreme variations in data reporting methods.

The wide range from NCDC data reporting 54 deaths in a year to the WHO estimate of 20,000 deaths is highly inconsistent and indicates the apathy of policymakers in ensuring a robust surveillance system for a disease with 100 per cent fatality. The estimates of 20,000 annual rabies deaths projected by the WHO need challenging by our government and call for transparency about the inputs on which this highly concerning estimate by the WHO is based.

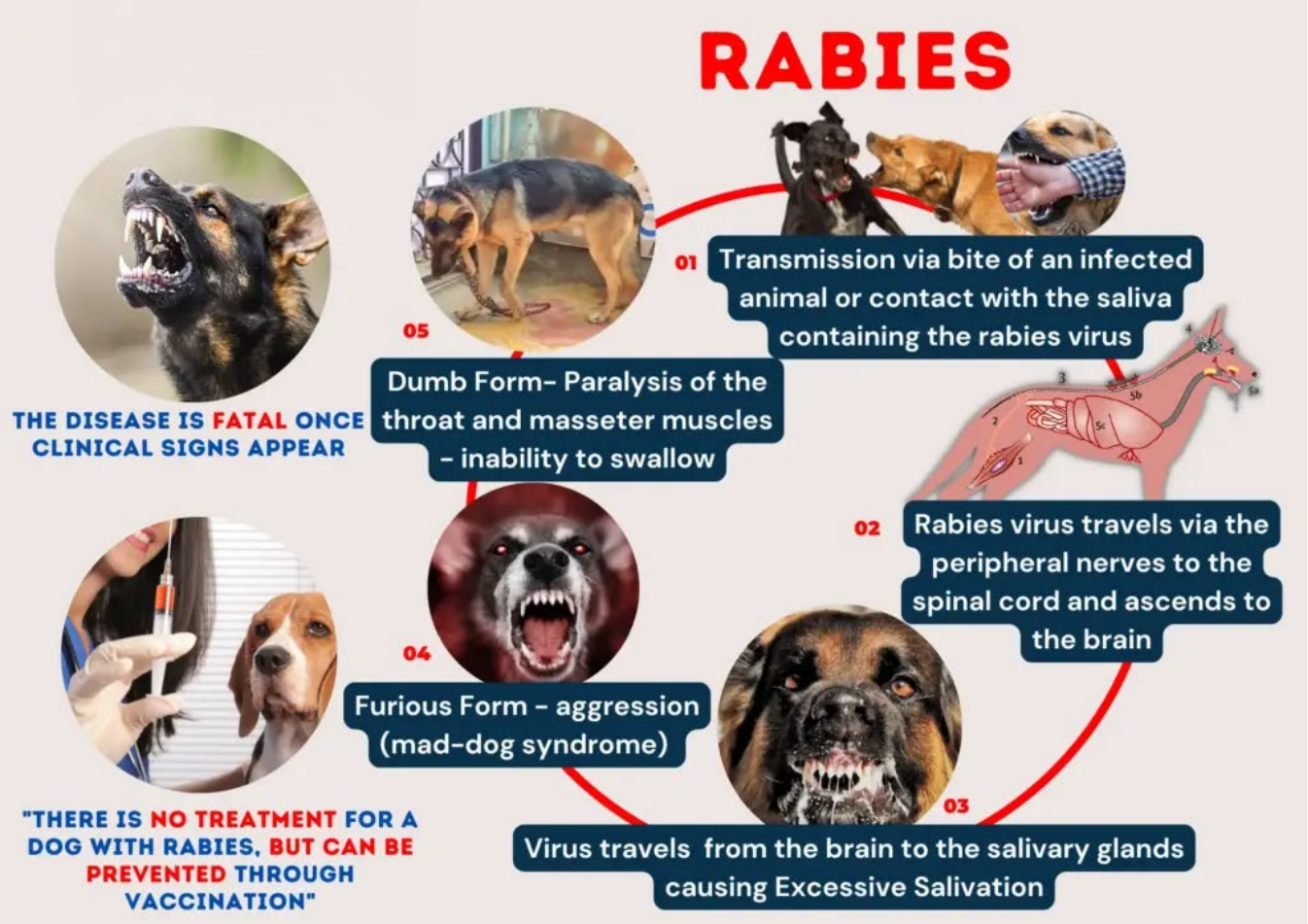
If we cannot measure the burden accurately, how are we going to address it?

Robust surveillance and reliable data on rabies are urgently required for our country before we contemplate any future drastic strategy at huge investments such as the universal roll-out of pre-exposure prophylaxis by including rabies vaccine in the Universal Immunisation Program.

This is not a far-fetched contemplation as a recent paper in Lancet Regional Health South East Asia, by Lodha et al, titled, "Rabies Control in High Burden Countries: role of universal pre-exposure Immunisation" published in December 2023, presents the necessity and rationale for including pre-exposure immunisation with rabies vaccine in India's national immunisation schedule. Obviously, this paper is going by the WHO's estimate of 20,000 deaths from rabies in India every year.

Without any reliable data and the ridiculously high estimates by the WHO, launching such a public health program will amount to public health quackery.

In the interim, equitable access to post-exposure prophylaxis to augment



energetic first aid of dog bites by training of all healthcare workers right up to the rural areas will prevent many deaths from rabies.

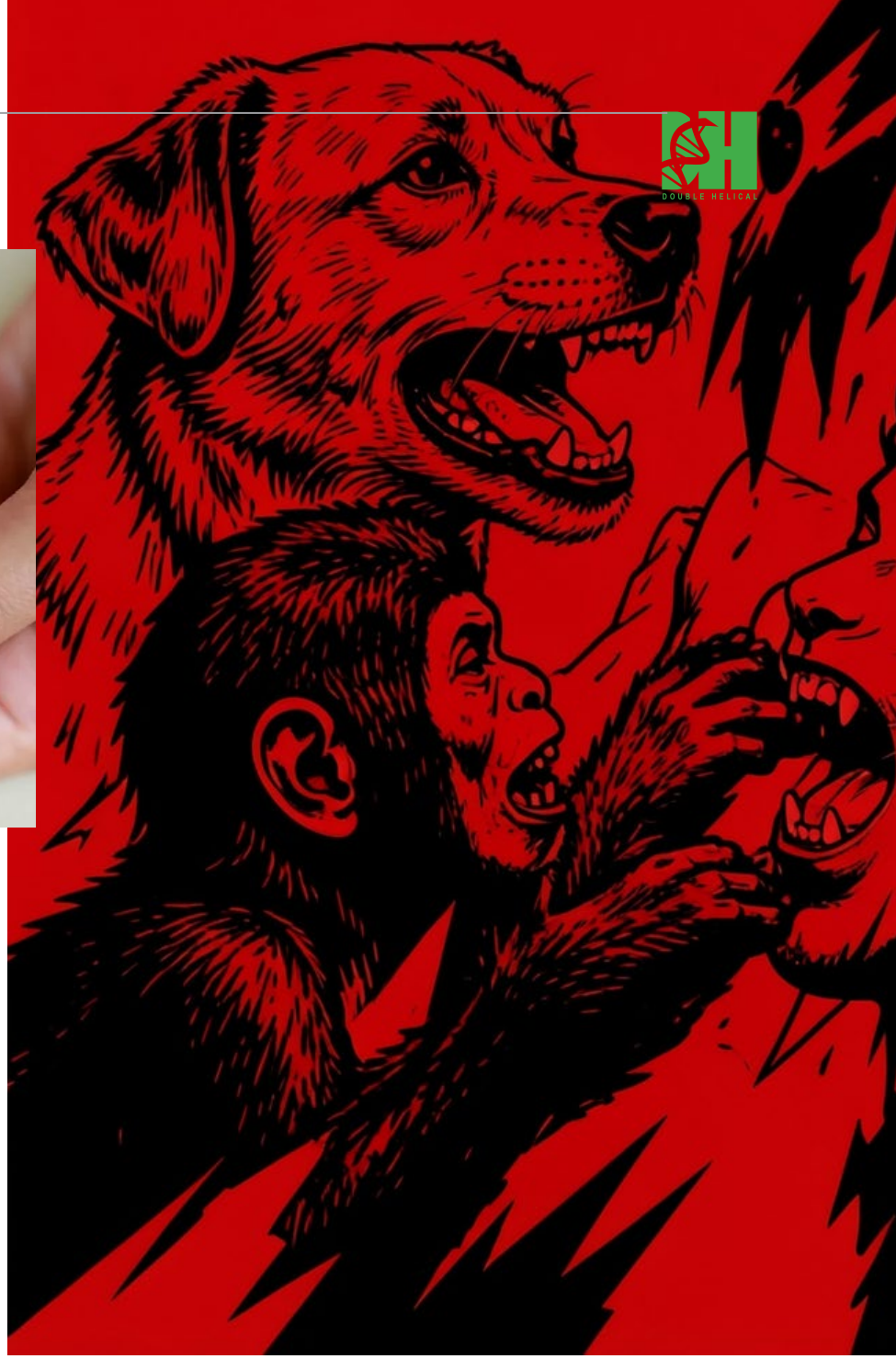
Proper availability and storage of rabies immunoglobulins and rabies vaccine right up to the Primary Health Centre level is also crucial.

FAILURES OF RABIES VACCINES IN INDIA

While the rabies vaccine is effective when administered correctly, several factors in India have led to documented cases where individuals died despite being vaccinated. Recent reports from states like Kerala and Maharashtra highlight that most "vaccine failures" are actually due to deviations from standard medical protocols such as:

- Omission of Rabies Immunoglobulin (RIG): For Category III exposures (deep bites or bites with blood), the vaccine alone is insufficient because it takes 7–14 days to produce antibodies. RIG provides immediate passive immunity. Many deaths in India occurred when patients received the vaccine but were not given RIG.
- Improper Wound Management: Failure to immediately wash the wound with soap and water for 15 minutes can lead to failure. This simple step can flush away a significant amount of the virus before it enters the nervous system.
- Incorrect Injection Site: Medical guidelines strictly prohibit administering the vaccine in the gluteal muscle (buttocks) because the absorption rate is poor. Several deaths in India have been linked to this specific error by healthcare providers.

> **We have to have a reliable database on rabies cases and deaths, by initiating registries on digital platforms to generate real-time figures instead of gross estimates, which go widely off the mark**



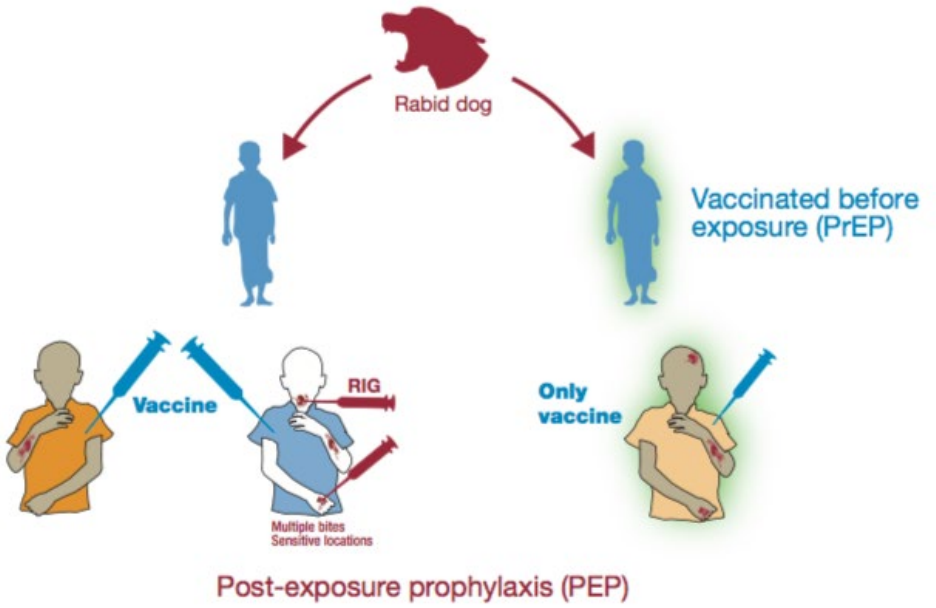
- Anatomical Location of Bite: Bites on the face, head, or hands have a much shorter distance to the brain. In these cases, the virus may reach the central nervous system before the vaccine-induced antibodies can take effect.
- Cold Chain Failure: Vaccines must be stored between 2°C and 8°C. Inconsistent electricity or poor management in smaller health facilities can render genuine vaccines ineffective.
- Shortages and Quality Testing: Extreme shortages in some states have reportedly led to the distribution of vaccine batches before they could undergo full quality testing at the Central Drugs Laboratory.
- Fake Rabies Vaccines: In recent years, more serious concerns regarding the vaccine supply chain and quality have emerged.

In late 2025, international health bodies including the CDC and Australian health authorities issued alerts about counterfeit batches of the popular Abhayrab vaccine circulating in major Indian cities.

The concerned manufacturer, Indian Immunologicals (IIL), did concede that in January 2025 it identified one batch in the market, Batch No. KA24014, with packaging that did not match the original. The company said it informed regulators in India and law enforcement agencies, lodged a complaint, and worked with authorities for action. IIL stated that this was one incident.

Fake drugs in the Indian markets are becoming a serious issue. Strengthening the drug control machinery with more inspectors and checks particularly for life-saving vaccines and drugs together with fast courts and stringent punishments for offenders is urgently required. Regrettably, our track record on regulatory control of quality of drugs is not commensurate with our aspiration of being the “pharmacy of the world”.

INDIA’S STRAY DOG PROBLEM AND HIGH RATES OF DOG BITES



India reports over 3.7 million (37 lakh) dog bite cases annually. Recent government data indicated 37,17,336 reported dog bites in 2024, averaging over 10,000 cases per day. The majority of these bites are from stray dogs.

Control of stray dogs can also contribute in bringing down the cases of rabies in the country.

The Supreme Court (SC), on 11 August 2025, ordered all stray dogs to be removed from the streets of Delhi, the national capital, and housed in dedicated shelters under the arrangement of the concerned authorities, within eight weeks.

The SC ruling triggered heated debate and protest by animal activists. They declared the recommendations of the court impracticable as there are over 10 lakh stray dogs in Delhi with non-existent shelters. They further stated that confining them in crowded makeshift shelters can precipitate zoonoses, including the deadly rabies.

According to Maneka Gandhi, implementing the SC orders would need a colossal sum of Rs 15,000 crore. Besides, she said, the vacuum effect can draw other animals like rats and monkeys. Gandhi instead recommended strict enforcement and close monitoring of Animal Birth Control Centres (ABCs).

In response to these concerns, the SC made a U-turn following discussions on the issue, with the court emphasising the implementation of the existing Animal Birth Control Rules 2023. The SC withdrew its directives and called for a national strategy on the problem.

This flip-flop is the result of years of apathy. Lack of attention to the problem of stray dogs and other animals on our streets has resulted in this stalemate.

The ABC program, which appears to be the consensus of all stakeholders, would also require huge resources such as veterinary surgeons, operating rooms, dog catchers, supporting staff, and vehicles.

THE WAY FORWARD

We have few choices. We cannot wish away the problem. The ABC program should be implemented in letter and spirit, irrespective of the costs and resources involved. In addition, we have to have a reliable database on rabies cases and deaths, by initiating registries on digital platforms to generate real-time figures instead of gross estimates, which go widely off the mark and have the potential to drag us into drastic investments incurring huge costs such as universal pre-exposure immunisation against rabies.

We cannot put the cart before the horse. To launch such a program we should have robust surveillance and monitoring of rabies deaths and not depend on shortcuts like mathematical models which are increasingly being used by the current genre of laptop epidemiologists.

FROM FIXATION TO REJUVENATION

Spinal management is undergoing a remarkable transformation. Today, the primary focus is not merely on fixing anatomy but on preserving function and restoring independence for patients with complex conditions.

BY DR H S CHHABRA

Spinal disorders have quietly become one of the most daunting health challenges of modern society. From young professionals struggling with posture-related back pain to elderly patients facing degenerative spine disease, spinal ailments now account for a major share of global disability. Yet, despite this growing burden, the field of spinal care is undergoing a remarkable transformation.

Over the last decade, spinal management has evolved far beyond the traditional divide of "conservative care versus surgery". Today, it represents a highly integrated continuum—starting with prevention and early diagnosis, progressing through safer and more precise surgery, and extending into neuromodulation, stimulation technologies, and technology-driven rehabilitation aimed at restoring independence.

This is the new age of spinal care—where the focus is not only on fixing anatomy but also on preserving function, improving quality of life, and enabling recovery even in previously irreversible conditions.

PREVENTION: THE FIRST AND MOST POWERFUL TREATMENT

While high-end technology often dominates discussions, some of the most important progress has occurred in an area

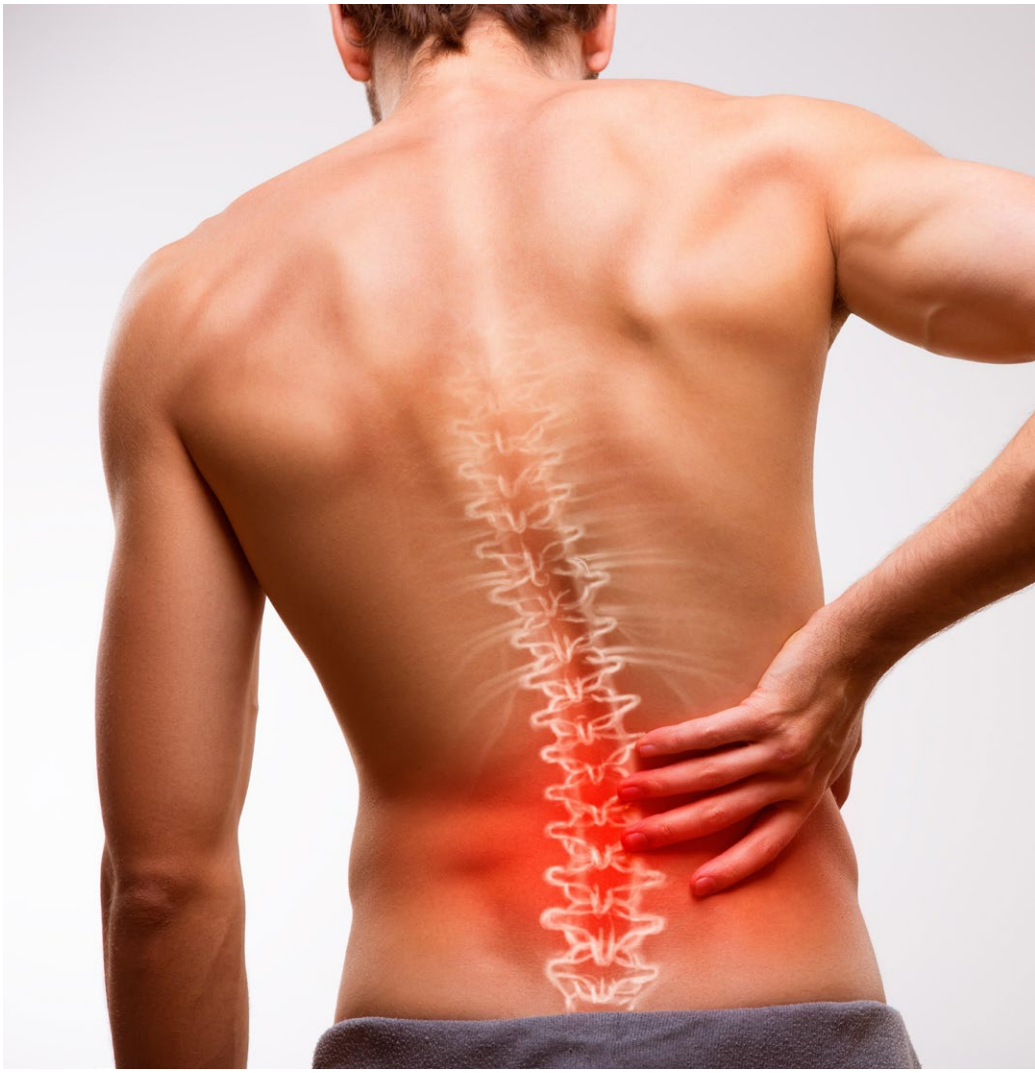
that receives far less attention—prevention.

Spinal disorders are strongly influenced by lifestyle. Poor posture, sedentary habits, obesity, smoking, and metabolic disorders accelerate the degeneration of discs and joints. Recognising this, spine care has gradually shifted toward preventive health models.

Workplace ergonomics programs are increasingly being adopted, particularly in corporate settings where prolonged sitting has become the norm. Awareness of correct lifting techniques, safe manual handling, and spine-friendly working postures has helped reduce occupational spine injuries.

At an individual level, structured fitness approaches focusing on core strengthening, flexibility, posture training, and conditioning are proving highly effective in reducing the recurrence of back pain. Yoga and Pilates-based regimens, supervised physiotherapy, and guided exercise therapy are now frequently prescribed not just for treatment but also for long-term prevention.

Equally important has been the growing emphasis on bone health. Early osteoporosis screening, timely initiation of anti-osteoporotic medications, vitamin D optimisation, and fall prevention programs have significantly reduced fragility fractures of the spine—an increasingly common cause of disability in older adults. In many ways, modern spinal management begins long before the operating room.



PRECISION DIAGNOSTICS: SEEING MORE, UNDERSTANDING BETTER

Accurate diagnosis has always been central to effective spine care, but recent advances have elevated this to an entirely new level. Conventional MRI and CT scans remain the backbone of evaluation, but newer imaging techniques now allow clinicians to see the spine in much greater detail and interpret pathology with greater confidence.

> **Spine care is shifting from standard implants for everyone to precision engineering for the individual, using 3D-printed implants and biomechanical modelling to match unique patient anatomy.**

High-resolution MRI protocols, advanced spinal cord imaging, and dynamic assessments for instability help correlate symptoms more precisely with structural abnormalities. For conditions such as cervical myelopathy, tumours, and complex stenosis, these tools provide a clearer understanding of the neural structures at risk.

The concept of spinal alignment has also gained renewed attention. Full-spine standing radiographs and sagittal balance analysis have shown that pain and disability

> **Intraoperative imaging and navigation have become the "GPS" of the operating room, allowing surgeons to visualise the spine in three dimensions and improve the accuracy of implant positioning**

are not just caused by local degeneration but are often driven by global spinal imbalance. Correcting alignment has become a key objective in deformity and degenerative surgery.

Artificial intelligence (AI) is now emerging as a powerful partner in diagnostics. AI-assisted imaging analysis is being developed to quantify degeneration, identify subtle changes, and even predict progression. While still evolving, these tools are likely to bring more objectivity and standardisation to spinal evaluation.

PLANNING THE SURGERY: THE RISE OF PERSONALISED SPINE CARE

Spine surgery has historically been complex because every patient's anatomy is unique. Today, planning has become far more personalised.

Surgeons increasingly use computer-based biomechanical modelling to simulate stress patterns, anticipate implant loads, and optimise correction strategies—especially in deformity and revision surgery. This is particularly valuable in osteoporotic patients, where implant failure remains a concern.

One of the most exciting developments is the rise of 3D-printed implants. Custom-made cages and vertebral reconstruction devices can now be designed to match patient anatomy with remarkable precision. In tumour surgery, infection, and complex reconstructions, such implants improve fit, stability, and long-term integration. Patient-specific cutting guides and osteotomy templates have also improved surgical accuracy while reducing operative time.

Spine care is gradually shifting from "standard implants for everyone" to "precision engineering for the individual".

SAFER SPINE SURGERY: PERIOPERATIVE ADVANCES MAKING THE DIFFERENCE

If there is one factor that has most dramatically improved spine surgery outcomes, it is the revolution in perioperative management. Many of the safety gains in spine surgery have not come from the surgeon's hands alone but from better systems of care surrounding the operation.

Enhanced Recovery After Surgery (ERAS) protocols have transformed the spine surgical pathway. These programs focus on preoperative counselling, optimisation of nutrition and anaemia, meticulous pain control, and early mobilisation. Patients recover faster, complications are reduced, and hospital stays are shortened.

Anaesthesia has also evolved

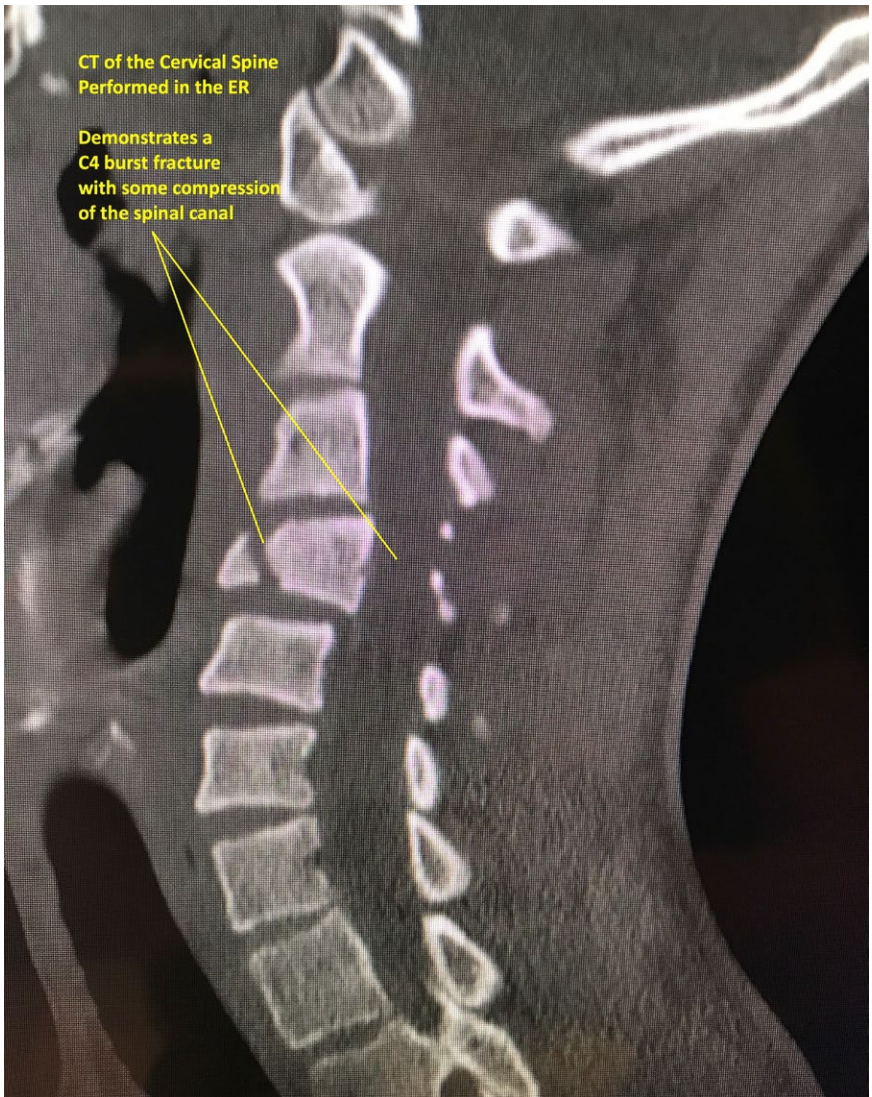
significantly. Total intravenous anaesthesia (TIVA) has become widely adopted for complex procedures, particularly because it is compatible with neuromonitoring. Better haemodynamic control reduces the risk of spinal cord ischaemia, and multimodal pain management reduces opioid dependence.

Modern blood conservation techniques, such as tranexamic acid protocols, cell salvage systems, and restrictive transfusion strategies, have further reduced morbidity—especially in deformity correction surgeries where blood loss can be significant. In short, spine surgery is safer today because the entire ecosystem surrounding the procedure has become safer.

NEUROMONITORING: A SILENT GUARDIAN IN THE OPERATING ROOM

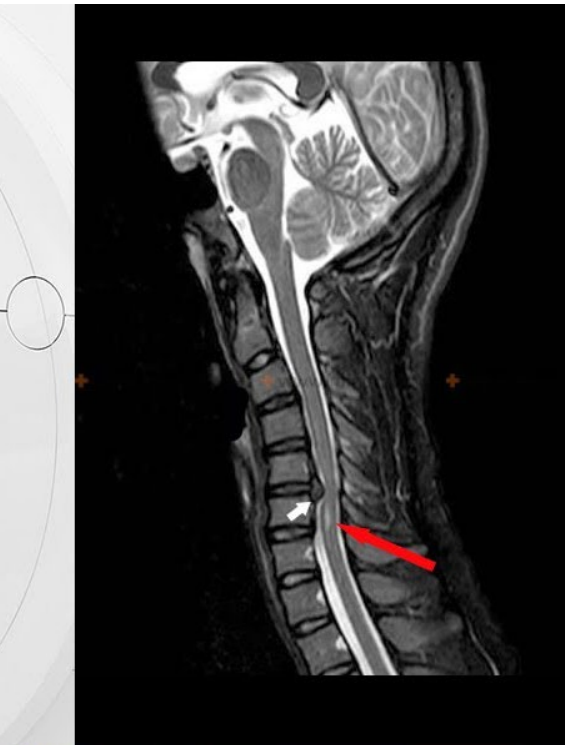
Intraoperative neuromonitoring (IONM) has become one of the most significant safety innovations in spine surgery. Using tools such as somatosensory evoked potentials (SSEPs), motor evoked potentials (MEPs), and electromyography (EMG), surgeons and neurophysiology teams can continuously monitor the functional integrity of the spinal cord and nerve roots during surgery.

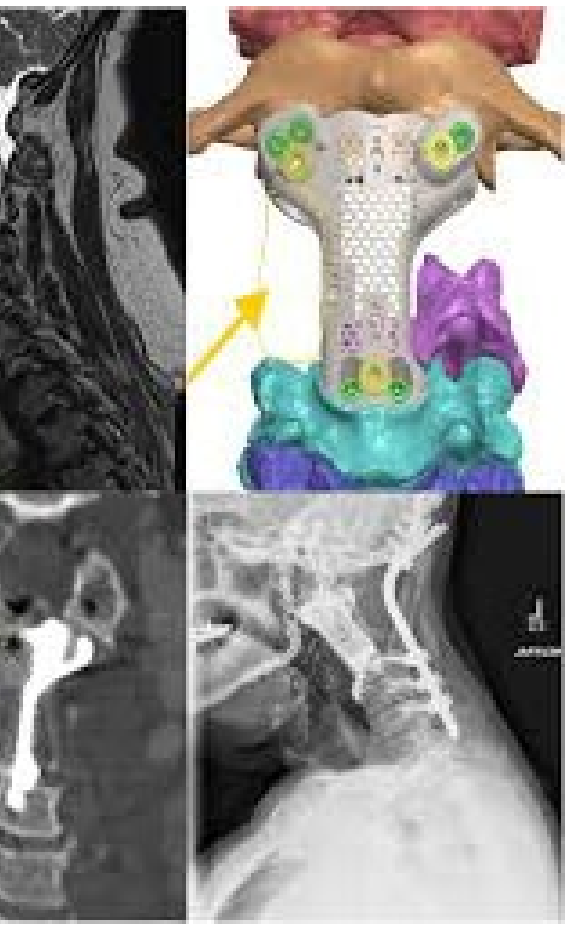
If the spinal cord is placed at risk during deformity correction, tumour resection, or trauma stabilisation, neuromonitoring provides an early warning—often before permanent damage occurs. The team can then immediately modify the surgical strategy. This real-time functional feedback has played a major role in reducing catastrophic neurological complications and has increased confidence in performing complex spinal reconstructions.



3D INTRAOPERATIVE IMAGING AND NAVIGATION: THE GPS OF SPINE SURGERY

The spine is anatomically complex,





> **Modern pain management has undergone a paradigm shift away from opioids; instead, it utilises multimodal strategies and targeted injections to address specific pain pathways more intelligently.**

and even a millimetre of error in instrumentation can have serious consequences. This is where intraoperative imaging and navigation have transformed modern spine surgery.

Technologies such as cone beam CT and O-arm imaging allow surgeons to visualise the spine in three dimensions during surgery itself. Combined with navigation platforms, this has improved the accuracy of pedicle screw placement and implant positioning—particularly in deformity surgery, revision cases, and cervical spine instrumentation.

Beyond accuracy, these systems reduce repeated fluoroscopy use, lowering radiation exposure for both patients and operating room staff. Navigation has effectively become the "GPS" of spine surgery.

ROBOTICS AND MINIMALLY INVASIVE SURGERY: PRECISION WITH LESS TRAUMA

Minimally invasive spine surgery (MISS) has expanded rapidly. The objective is simple: achieve the same decompression or stabilisation with less muscle damage, less blood loss, and faster recovery.

Endoscopic spine surgery has moved beyond simple lumbar discectomy and is now being used for foraminal stenosis, selected thoracic decompressions, and even some cervical procedures. Patients often experience reduced postoperative pain and earlier mobilisation.

Percutaneous fixation techniques have similarly expanded, especially in trauma stabilisation and metastatic spine disease, where reduced surgical trauma is particularly valuable.

Robotics have added another dimension. Robotic-assisted spine surgery improves consistency and precision in pedicle screw placement, especially in challenging anatomy. When combined with navigation, robotics enhances reproducibility and reduces intraoperative radiation exposure. The future spine surgeon is increasingly supported by imaging, navigation, and robotics working together.

BIOLOGICS AND FUSION ENHANCEMENTS: STRENGTHENING THE HEALING PROCESS

Spinal fusion remains a cornerstone procedure for instability, deformity, and degenerative conditions. While implants provide stability, true success depends on biological healing.

Here too, major advances have emerged. Bone morphogenetic proteins (BMPs), refined graft substitutes, bioactive scaffolds, and composite materials have improved fusion success rates—especially in revision surgery and for high-risk patients such as smokers or osteoporotic individuals.

Stem cell therapy and regenerative medicine are also being explored for both fusion enhancement and disc regeneration. While clinical evidence is still evolving, these strategies represent a major scientific push toward slowing degeneration rather than simply managing its consequences. The spine field is now moving toward a future where biology and engineering work together.

PAIN MANAGEMENT: A SHIFT AWAY FROM OPIOIDS

Chronic spinal pain remains one of the most challenging aspects of spine care.

Historically, opioid-heavy approaches dominated. Today, pain management has undergone a major paradigm shift.

Multimodal pain strategies now incorporate non-opioid analgesics, neuropathic pain agents, targeted injections, and structured rehabilitation. Interventional pain procedures—such as epidural injections, nerve root blocks, facet joint interventions, and radiofrequency ablation—are increasingly used with greater precision due to improved imaging guidance.

Emerging pharmacological strategies are also exploring biologic targets such as nerve growth factor pathways, aiming for better long-term pain control with fewer side effects. Pain management is no longer about suppressing symptoms; it is increasingly about targeting pain mechanisms.

NEUROMONITORING AND STIMULATION TECHNOLOGIES: BEYOND PAIN RELIEF

Perhaps the most exciting frontier in spinal management lies in stimulation technologies. Neuromonitoring has expanded beyond traditional spinal cord stimulation into a broad range of applications.

Modern spinal cord stimulation (SCS) now includes high-frequency and burst waveforms that provide paraesthesia-free relief. Closed-loop systems can automatically adjust stimulation intensity based on real-time neural feedback, improving consistency across posture changes.

Dorsal root ganglion (DRG) stimulation offers highly targeted therapy for focal pain syndromes such as complex regional pain syndrome (CRPS). Peripheral nerve stimulation is similarly expanding, providing minimally invasive solutions for radicular and musculoskeletal pain.

Non-invasive brain stimulation has also entered the discussion. Repetitive transcranial magnetic stimulation (rTMS) is being studied for chronic pain and functional recovery by modulating cortical networks involved in pain perception and movement control.

Even more significant is the growth of autonomic neuromodulation, particularly bladder neuromodulation. Sacral neuromodulation and tibial nerve stimulation are increasingly being used for neurogenic bladder dysfunction, improving continence and reducing infections in patients with spinal cord injury and degenerative disorders.

In spinal cord injury, epidural electrical stimulation has demonstrated promising results in enabling standing, stepping, and improving autonomic stability when combined with intensive rehabilitation. Early research into brain–spine interfaces has taken this concept further, aiming to restore volitional movement by decoding brain signals and activating spinal circuits. The concept of "incurable paralysis" is gradually being challenged—not by surgery alone, but by neuroengineering.

REHABILITATION: ROBOTICS, EXOSKELETONS, AND IMMERSIVE RECOVERY

Rehabilitation has become the final—and perhaps most decisive—pillar of spinal recovery. Traditional physiotherapy remains fundamental, but modern rehabilitation is increasingly powered by advanced technology.

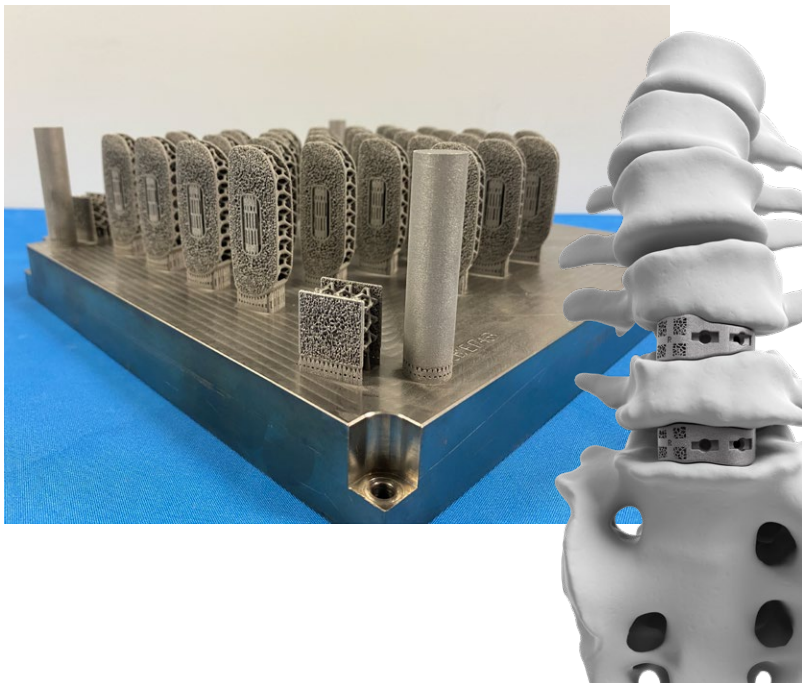
Robotic exoskeletons now allow spinal cord injury patients to stand and walk with assistance, offering not only mobility but also significant systemic benefits such as improved cardiovascular health, reduced osteoporosis, improved bowel function, and psychological well-being.

Body-weight supported treadmill training has become a standard neurorehabilitation tool, allowing repetitive gait cycles with controlled loading. This high-repetition, task-specific training is critical for neuroplasticity and functional improvement. Robotic rehabilitation devices further enhance consistency, repetition, and objective progress measurement—something conventional therapy cannot always deliver.

Virtual reality (VR) has introduced immersive rehabilitation environments that increase patient motivation and adherence, turning repetitive exercises into engaging tasks. Augmented reality (AR) adds another dimension by overlaying posture and alignment guidance onto real-world movement, improving precision in motor learning.

Wearable sensors and tele-rehabilitation platforms now allow clinicians to monitor patient recovery remotely, extending expert care into homes and under-served regions. Rehabilitation has moved from being "supportive care" to becoming a high-tech science of functional restoration.

Through robotic exoskeletons and immersive virtual reality, rehabilitation has transformed from supportive care into a high-tech science aimed at rebuilding independence and systemic well-being.



A NEW SPINE ERA

Spinal management is no longer defined by surgery alone. It is now a continuum that begins with prevention, progresses through precision diagnosis and safe intervention, and extends into neuromodulation and advanced rehabilitation.

The spine field is entering an era where the goals are not merely decompression and fixation, but:

- Reducing disability before it begins.
- Improving surgical safety and predictability.
- Targeting pain pathways more intelligently.
- Restoring neurological function through stimulation technologies.
- Rebuilding independence through robotics and immersive rehabilitation.
- The future of spine care will likely be defined by precision medicine, artificial intelligence, biologics, robotics, and neuroengineering, working together to deliver outcomes that were once unimaginable. Spinal care is no longer just about treating the spine—it is increasingly about restoring the person.

(The author is Director of Spine & Rehabilitation, Sri Balaji Action Medical Institute; President, Spinal Cord Society & Association of National Board Accredited Institutions, New Delhi)

SPREADING GLOBAL TEN-TACLES

As we mark World Malaria Day 2026, the global health community is confronting the epic "Paradox of Progress."

BY PROF (DR) ADITI AIKAT / DR SUNEELA GARG

We have 47 countries and one territory malaria-free, but the finish line seems to be drawing ever wider. The world reported 282 million cases and 610,000 deaths in 2024, slightly higher compared to the year before.

We now have 47 countries and one territory certified malaria-free, but the finish line seems to be moving ever farther away. The world reported 282 million cases and 610,000 deaths in 2024, higher than the previous year. This stalling is perhaps most evident in Vanuatu (Oceania), where cases jumped from a record low of 322 in 2021 to 1,995 in 2023. Fuelled by the "multiplier effect" of climate events such as Tropical Cyclones Kevin and Judy, along with devastating diagnostic failures, Vanuatu's crisis serves as a cautionary tale for the world.

The theme for 2026, "Driven to End Malaria: Now We Can. Now We Must," captures this strategic juncture. Science has proved the "Now We Can" part, but biological and financial headwinds are testing our operational resilience.

THE SILENT FAILURE OF OUR GREATEST TOOLS

We are now losing our biological "return on investment" (ROI) because parasites are outpacing our current chemotherapy and diagnostic infrastructure. This is not stepwise erosion; it is a "silent failure" in which our principal interventions are being "hacked" by evolution.

Resistance to Artemisinin in the Ring Stage: Artemisinin resistance, affecting the mainstay of global treatment, has now been reported in Eritrea, Rwanda, Uganda and the United Republic of Tanzania. This resistance relates specifically to the "ring stage" of the parasite cycle, with a potentially lethal prolongation of parasite clearance, allowing the disease to continue and spread dangerously.

Invisible Parasites: The spread of pfhrp2 gene deletions has made the disease "invisible." These genetic mutations can make classic rapid diagnostic tests (RDTs) produce false-negative results. This systematic diagnostic failure, now documented in 46 endemic countries, was a major driver of the resurgence in Vanuatu.

The Evolutionary Certainty: Dr Martin Fitchet, head of Medicines for Malaria Venture, Geneva, Switzerland, says that although we can prolong the effectiveness of existing medicines, "outright drug failure" is an "evolutionary certainty." We are using tools that the enemy is quickly learning to ignore.

The $5.4 Billion Gap: A Strategic Blindfold

There is a catastrophic disconnect between scientific potential and financial reality. Global investment in 2024 stood at only $3.9 billion — less than half of the $9.3 billion needed in 2025. This $5.4 billion shortfall is no longer a mere budget line; it is a death sentence. The cost of this gap can be measured in Zambia. According to modelling by the Malaria Atlas Project, sustained support at 2025 levels could have prevented up to 392,486 malaria cases and 3,610 malaria deaths in Zambia. Instead, funding cuts from critical donors such as the US President's Malaria Initiative (PMI) have affected "non-lifesaving" interventions such as surveillance and Social and Behaviour Change Communication (SBCC). Strategically, cutting surveillance at a time when parasites are developing gene deletions is a grave mistake. It creates a "strategic blindfold." "We cannot fight an enemy we don't understand," warns Dr Daniel Ngamije, WHO Director of Malaria and Neglected Tropical Diseases. Surveillance is not a luxury; it is the only way to monitor "invisible" mutations and maintain operational control.

Invasive Urban Threat: Anopheles stephensi

Malaria is no longer merely a "poor man's rural disease." The spread of Anopheles stephensi across the continent has effectively shifted the arena of war to densely populated urban locations. This invasive species is

transformative for three reasons:

Urban adaptability: Unlike traditional vectors, it thrives in man-made water containers and urban infrastructure.

Insecticide resistance: It is resistant to chemicals used in traditional bed nets and indoor spraying.

A precision challenge: Traditional "broad-spectrum" control is not sufficient because it breeds in diverse urban micro-environments. A shift towards Precision Public Health is therefore needed.

THE GENETIC FRONTIER: GENE DRIVE-MODIFIED MOSQUITOES (GDMMS)

With conventional tools failing, a radical — though controversial — approach is emerging on the "Genetic Frontier." Gene Drive-Modified Mosquitoes (GDMMs) offer a more specific tool for vector control than broad-spectrum chemical pesticides. The global health community is now evaluating so-called "low-threshold" gene drives — systems that can rapidly spread a modification after a small initial release and may continue indefinitely thereafter. Decision-makers are considering two main genetic strategies:

Population suppression: Target mosquitoes to wipe out the local population and eliminate the vector altogether.

Population modification: Use this strategy to make mosquitoes biologically incapable of carrying the malaria parasite, thereby neutralising the vector without removing it from the food web.

The tension points to the "Now We Must" imperative: advocates are pushing for a quicker pace to save lives, while environmental safety monitoring, as illustrated by VeriXiv studies, still calls for the "slower, patient work" of protecting biodiversity.

VACCINE REVOLUTION: A FRAGILE MOMENT

For children under five, the rollout of R21/Matrix-M and RTS,S vaccines in 25 countries is a historic win. According to UNICEF, Zambia has already become the 24th country to introduce the R21 vaccine, and the first phase of the rollout saw 532,000 doses administered across 83 districts — 79 high-burden and four moderate-burden districts. For caregivers like Chimwemwe Mawlelele, the vaccine is a hopeful reminder: "I will encourage my fellow mothers to bring their babies for vaccination, so that their babies don't get very sick." But this revolution is delicate. It depends on the "cold chain" — the technical infrastructure necessary to keep vaccines potent. Technicians such as Lloyd Andrew work with a newly strengthened technical workforce in Zambia, trained in solar-powered refrigeration. If funding for this "last-mile" maintenance continues to shrink, vaccine doses may lose potency before they reach a child's arm.

AN OBLIGATION, NOT MERELY AN OPTION

Science has given us the "Now We Can." We have vaccines, dual-insecticide nets and the power of genetic technologies. But plateaued progress in Africa, and resurgence in climate-affected regions such as Vanuatu, suggest that tools alone are not enough. We need a Precision Public Health approach — one that uses artificial intelligence, geospatial mapping and real-time data to ensure that every dollar of the $3.9 billion available serves the population more efficiently. We can end, in our lifetime, a disease that kills hundreds of thousands of children. Failure to finance these proven interventions is not due solely to limited resources; it is also a failure of global solidarity. The prospect of elimination has never been greater, but neither has the price of letting it slip away.

(The authors are Professor & Head, Department of Community Medicine, Dean Students' Affairs, JIMSH, Central Campus, Kolkata/ Professor Emeritus, National Academy of Medical Sciences, Ministry of Health and Family Welfare; Professor of Excellence and Ex Sub-Dean, MAMC, New Delhi)

LOW-RISE LIVING.
HIGH ON PEACE.

TREHAN LUXURY FLOORS
MKS COUNTY

Low-Rise Residences

SECTOR 2, SOUTH OF GURUGRAM

ONE NAME YOU CAN TRUST

TIMELY | TRUSTED | TRANSPARENT

ON TIME, EVERY TIME

Homes built with precision & delivered with trust!

On-time delivery, not just
a promise but a track record we have
maintained since inception.

3 BHK LUXURY FLOORS

GURGAON | SOHNA