

ICMR Introduces 'CEREBO' to Diagnose Brain Injury

August 24, 2025 • vajiramandravi.com



Brain Injury Latest News

- ICMR has launched **CEREBO**, an indigenous portable device for rapid, radiation-free diagnosis of traumatic brain injuries, aiming to improve emergency and rural healthcare access.

Introduction

- India records one of the world's highest incidences of head injuries, with more than 100,000 deaths annually and over a million serious injuries.
- Timely diagnosis of **traumatic brain injuries** (TBI) is critical, as nearly half of the fatalities occur within the first two hours.
- However, advanced diagnostic tools like CT (Computed Tomography) and MRI (Magnetic Resonance Imaging) remain inaccessible in many rural and emergency settings.
- Addressing this gap, the **Indian Council of Medical Research** (ICMR) has introduced **CEREBO**, an indigenous, portable, and non-invasive diagnostic tool that can revolutionise TBI care in India.

About the CEREBO Device

- CEREBO is a handheld diagnostic device developed using **near-infrared spectroscopy** combined with machine learning algorithms. It is:
 - **Radiation-free and safe** for infants and pregnant women.
 - **User-friendly**, operable by paramedical staff or unskilled personnel after just 30 minutes of training.
 - **Efficient**, capable of detecting intracranial bleeding and oedema in under a minute.
 - **Cost-effective**, eliminating the need for expensive imaging infrastructure.
- The device provides **colour-coded results** that enable quick triage and decision-making in critical situations.

Development and Collaboration

- CEREBO is a product of collaboration between **ICMR, the Medical Device and Diagnostics Mission Secretariat (MDMS), AIIMS Bhopal, NIMHANS Bengaluru, and Bioscan Research**. It has undergone:
 - **Clinical validation** and regulatory approvals.
 - **Multi-centre performance trials** supported by ICMR's mPRiDE scheme.
 - **Feasibility studies** at trauma and neurosurgical centres to test diagnostic accuracy and integration in emergency care pathways.
- This groundwork ensures that CEREBO is ready for widespread deployment in hospitals, ambulances, rural clinics, and disaster response units.

Significance for Healthcare

- CEREBO addresses multiple challenges in brain injury diagnosis:
 - **Accessibility Gap** – Rural and semi-urban regions often lack CT/MRI facilities, delaying critical care.
 - **Affordability** – CT and MRI scans are expensive and require trained personnel; CEREBO reduces costs significantly.
 - **Speed and Precision** – Immediate diagnosis improves survival rates and reduces disability.
 - **Emergency Deployment** – Designed for ambulances and trauma centres, the tool strengthens India's disaster and military healthcare response.
- By offering an indigenous alternative, India also reduces dependence on imported diagnostic equipment.

Public Health Impact

- According to the **Indian Head Injury Foundation**, nearly 50% of TBI-related deaths happen within two hours of injury.
- Often, secondary brain damage caused by bleeding and swelling progresses during this window. Early detection through CEREBO can:
 - Reduce mortality rates.
 - Improve recovery outcomes.
 - Lower the long-term disability burden on patients and families.

- The device also aligns with India's goal of **affordable healthcare access** and complements emergency medical services in high-risk areas like highways, rural belts, and conflict-prone regions.

Future Outlook

- ICMR is seeking support from State governments to integrate CEREBO into **tertiary care systems**. The aim is to:
 - Accelerate access to CT/MRI scans where needed.
 - Optimise patient triage in overcrowded trauma wards.
 - Reduce overall imaging costs.
 - Scale up adoption in **military, emergency, and global healthcare systems**.
- If widely adopted, CEREBO could serve as a **global model for low-cost TBI diagnosis**, particularly in developing countries facing similar healthcare challenges.

Source : **TH**

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