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IIT Mandi develops simple, portable device to detect ischemic stroke

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To aid in detecting ischemic stroke and can be used in rural, poor and remote areas for early diagnosis



Researchers at the Indian Institute of Technology (IIT) Mandi, in collaboration with PGIMER Chandigarh, have proposed and developed a simple, portable and cost-effective device to detect and diagnose stroke caused by impaired blood flow to the brain.

While explaining the research, Dr Shubhajit Roy Chowdhury, Associate Professor, IIT Mandi, said, “We are working towards finding a low-cost diagnostic technique to precisely detect ischemic stroke at the point of care so that such tests can be used in rural, poor and remote areas. Our team has designed and developed a small wearable device that makes use of Near Infrared Spectroscopy to detect ischemic stroke. In this device, a near-infrared light emitting diode (NIRS LED) emits light in the range of 650 nm to 950 nm. This light interacts with the coloured components of the blood like hemoglobin and provides information on blood characteristics such as regional oxygen saturation, regional oxygen consumption, and regional blood volume index.”

The IIT Mandi team performed studies measuring the bio-markers under ischemic conditions at the forearm and at the frontal lobe of the brain. The researchers also validated their detector prototype through experimental occlusion of the forearm and evoked ischemic stroke at the frontal lobe, and found excellent diagnostic potential.

As a result of the burden of stroke among Indians, the government's National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases & Stroke (NPCDCS) is focusing on early diagnosis and management at different levels of health care for all non-communicable diseases including stroke, in India. The development reported by the IIT Mandi team will help in enhancing access to stroke diagnosis throughout the country.