
Potential New Tool For Brain Surgeons

These techniques rely on large instruments that cannot be used in the operating room, and during the operation the brain may relax and move, forcing surgeons to adjust where they are cutting to minimize the damage to the brain tissue.

During surgery, doctors make these adjustments by asking their patients to perform certain tasks while electrically stimulating parts of the brain bordering where they plan to cut. The electrical stimulation inhibits brain function in that region, revealing whether losing that tissue would cause permanent damage. Although slow, this is a good way to detect and protect critical areas of the brain.

Now Paul Hoy and his colleagues at the University of Southampton in England are developing a rapid and highly sensitive method for measuring brain function across the entire area during surgery. The method is based on observing blood flow in the brain. Active brain regions have increased blood flow, and this change can be observed by looking at light reflected off the brain because hemoglobin, the protein that ferries oxygen within the bloodstream, will absorb light differently depending on whether it carries oxygen or not.

Recently Hoy and his colleagues measured this signal on four people undergoing brain surgery and showed that their results agreed with the electrical stimulation. They hope that the technique will one day provide information quickly for neurosurgeons, and they are now collecting data that will lead to a clinical trial designed to test how effective the technique is.

Medical research is a cornerstone of Frontiers in Optics 2008 (FiO), the 92nd Annual Meeting of the Optical Society (OSA), being held Oct. 19-23 at the Riverside Convention Center in Rochester, N.Y. FiO 2008 will take place alongside Laser Science XXIV, the annual meeting of the American Physical Society

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