

# Window of opportunity to treat some stroke patients may be longer than originally suspected

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Stroke victims may have a longer window of opportunity to receive treatment to save their brain cells, demonstrates a literature review published by University of Alberta medical researchers in *Lancet Neurology*.

The review, which was published online last week, was written by Ashfaq Shuaib and his colleagues. Shuaib, the senior author, is a researcher in the Division of Neurology with the Faculty of Medicine & Dentistry at the University of Alberta. He is also a practising neurologist and a [stroke](#) specialist.

Literature reviews, which bring together large amounts of information from numerous studies, is one form of clinical research often referred to as health-outcomes research. This kind of "translational" work is valuable, since it synthesizes knowledge that lab researchers know and analyzes it for practising physicians so they can provide better patient care. The Faculty of Medicine & Dentistry has special expertise in conducting sophisticated health-outcomes research – taking knowledge "from bench to bedside."

Shuaib reviewed stroke studies that examined the use of imaging to measure [blood flow](#) in the [brain](#) after a stroke. The [literature](#) was written from 1980 to July 2011. His review notes that using advanced neuroimaging, such as multi-dimensional brain CT scans and MRIs, can

provide physicians important information about blood flow in the brain following a stroke. This information could enable doctors to provide better treatment to prevent [brain cells](#) from dying, through the use of techniques to increase blood flow in the brain.

The review noted that the presence of good "collateral" blood flow in the brain can "sustain brain tissue for hours" after major arteries to the brain have been affected by a stroke, and this flow could potentially offset injury to the brain. Enhancing or maintaining strong blood flow is a potential therapeutic treatment for stroke; it is currently under investigation in several stroke centres around the world, he says.

Shuaib's review notes that stroke is the second most common cause of death, with the majority of the 16 million cases happening in developed nations. A lack of blood flow is the primary cause of a stroke. It is typically triggered by a blockage in a brain artery due to arteries thinning from a build-up of plaque, or by a mass from the heart or neck vessels restricting blood flow to the brain.

Normal blood flow in the brain is between 50-60 ml/100g/minute. If someone suffers a stroke and blood flow levels in the brain fall below 10 ml/100g/minute, brain cells die within minutes of the stroke. However, if blood flow in the brain is between 10-20ml/100g/minute, "the neurons cease function but remain structurally intact and are potentially revivable if normal blood flow is restored," Shuaib says in the review.

He further adds that brain cell death after a stroke may not be complete for hours or even days after a stroke, meaning that the window to treat some stroke patients is longer than three hours – the standard timeframe that has been referenced in medicine since the 1990s. Shuaib says cell death can be complete within as little as an hour in some people following a stroke, while other patients have viable brain tissue and cells for days or indefinitely after a stroke. And with current imaging

technology, physicians can determine whether brain cells are dead or have simply ceased functioning post-stroke.

"What we're recommending is, don't look at the window of time only, look at the important tissue window which may be quite prolonged in many patients," says Shuaib. "Don't just say, 'oh this person had a stroke 4.5 hours ago, end of story.' This person may have very good tissue you could treat."

Provided by University of Alberta

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