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Researchers find new therapy benefits stroke patients

Canadian researchers have completed an international randomized controlled trial showing that a clot retrieval procedure, known as endovascular treatment (ET), can dramatically improve patient outcomes after an acute ischemic stroke. The study, led by researchers at the University of Calgary's Hotchkiss Brain Institute (HBI), shows a dramatic improvement in outcomes and a reduction in deaths from stroke. The results of this study were published in the Feb. 11 online edition of the *New England Journal of Medicine (NEJM)*.

Overall, positive outcomes for patients increased from 30 per cent to 55 per cent. In many cases, instead of suffering major neurological disability, patients went home to resume their lives. The overall mortality rate was reduced from two in 10 patients for standard treatment of care to one in 10 patients – a 50 per cent reduction with ET.

“This is the most significant and fundamental change in acute ischemic stroke treatment in the last 20 years. These results will impact stroke care around the world,” says [Dr. Michael Hill](#), the senior author of the study, professor in the Cumming School of Medicine's departments of clinical neurosciences, and radiology and a neurologist with the Calgary Stroke Program of Alberta Health Services (AHS).

The clinical trial, known as [ESCAPE](#) (Endovascular treatment for Small Core and Anterior circulation Proximal occlusion with Emphasis on minimizing CT to recanalization times), shows there is a marked reduction in both disability and death among patients who receive ET for acute ischemic stroke. Ischemic stroke is caused by a sudden blockage of an artery to the brain that deprives the brain of critical nutrients, such as glucose and oxygen. Currently, the international standard of care based on Canadian, U.S. and European guidelines is to administer a drug called tPA when appropriate. Known as a ‘clot buster’, the drug dissolves the blood clot.

In the ESCAPE trial, 316 patients who fit the criteria for ET and arrived for treatment within 12 hours of their stroke were randomized to standard medical care (which included the clot-busting drug tPA where appropriate) or standard medical care plus ET.

ET is performed by inserting a thin tube into the artery in the groin, through the body, and into the brain vessels to the clot. This is done under image-guided care using an X-ray. The clot is then removed by a retrievable stent and pulled out, restoring blood flow to the brain.

Endovascular treatments were first developed in the 1990s, but ET has only recently been technically possible. The ESCAPE team says the success of the trial can be credited to very fast treatment and the use of brain and blood vessel imaging. In ESCAPE, researchers were on average two hours faster in opening the blocked blood vessels than in previously reported trials.

“Key reasons for the success of the trial were, firstly, selecting appropriate patients using novel imaging technology; secondly, better organization and workflow to expedite treatment; and thirdly, use of modern technology to open the blood vessels,” says [Dr. Mayank Goyal](#), professor of radiology and clinical neurosciences at the Cumming School of Medicine, co-principal investigator of the ESCAPE trial and first author on the publication, and lead interventional neuroradiologist on the ESCAPE trial. He performs the procedure at Foothills Medical Centre in Calgary, Alberta. “We believe that with the combined results from this trial and other trials, this will become the standard of care.”

ESCAPE is the second ET trial that demonstrates the efficacy of the treatment and the first trial to demonstrate reduced mortality. The previous trial, known as MR. CLEAN (**M**ulti center **R**andomized **C**linical trial of Endovascular treatment for **A**cute ischemic stroke in the **N**etherlands), was published in December 2014.

“This breakthrough has the potential to improve the lives of the 15 million people who suffer strokes worldwide each year,” says Ed McCauley, PhD, vice-president (research), University of Calgary. “University of Calgary researchers have been transforming health outcomes for close to 50 years now, and the work of Drs. Michael Hill, Mayank Goyal, and Andrew Demchuk will improve the quality of life for Albertans, Canadians and people around the world.”

“This remarkable achievement by the HBI Stroke Team is a shining example of brain research at its very best,” says Samuel Weiss, PhD, HBI Director and leader of the University of Calgary’s Brain and Mental Health strategy. “Our vision of ‘Healthy Brains for Better Lives’ has taken a giant leap forward.”

While research is improving outcomes, doctors still want patients to know the warning signs and symptoms of stroke.

“Many stroke treatments work only if administered in a set period of time. Many patients don’t get to the hospital in time. With stroke, when removing the clot with this new treatment, every minute matters,” says [Dr. Andrew Demchuk](#), another ESCAPE co-principal investigator and leader of both the Stroke Program at Foothills Medical Centre and the HBI Stroke Team. “If patients have facial drooping, arm weakness or speech difficulty, they need to call 9-1-1 immediately.”

The study included 22 sites worldwide and patients in the U.S., U.K., Ireland and South Korea. Canada had 11 participating hospitals and enrolled two-thirds of the patients.

In addition to being published online, the results of this landmark study will be published in the March 19 print edition of *NEJM* and presented at the American Heart Association’s International Stroke Conference in Nashville, Tenn.

The study was funded by The Heart and Stroke Foundation of Canada, Alberta Innovates-Health Solutions and Medtronic, along with generous donations to the HBI Stroke Team and the Calgary Stroke Program.

SITES

Foothills Medical Centre	Calgary, Alta.
Royal University Hospital	Saskatoon, Sask.
Colorado Neurological Institute	Denver, Colo.
St. Michael's Hospital	Toronto, Ont.
UPMC Medical Centre	Pittsburgh, Penn.
Queen Elizabeth II HSC	Halifax, N.S.
Toronto Western Hospital	Toronto, Ont.
University of Alberta Hospital	Edmonton, Alta.
Chattanooga Center for Neurologic Research	Chattanooga, Tenn.
CHUM-Hospital Notre-Dame	Montreal, Que.
MUSC-Medical University of South Carolina	Charleston, S.C.
Sunnybrook Health Sciences Centre	Toronto, Ont.
Ottawa Hospital	Ottawa, Ont.
London Health Sciences Centre	London, Ont.
McGill University (MNI)	Montreal, Que.
Beaumont Hospital	Dublin, Ireland
Abington Memorial Hospital	Abington, Penn.
Royal Victoria Hospital	Belfast, N. Ireland
Yonsei University (Severance Hospital)	Seoul, South Korea
Samsung Medical Centre	Seoul, South Korea
Keimyung University (Dongsan Medical Centre)	Daegu, South Korea
Temple University Hospital	Philadelphia, Penn.

Join the conversation on Twitter #ESCAPEstroke

Learn more about ESCAPE at <http://cumming.ucalgary.ca/escape-stroke> (website live on Feb 11 at 12 pm ET)

Learn more about ESCAPE in our YouTube video http://youtu.be/gwC6i-3_a3A

Download interviews and B-ROLL:

RAW Version: <http://vimeo.com/118831551> (password to download: AIHS)

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The University of Calgary's Cumming School of Medicine is a leader in health research, with an international reputation for excellence and innovation in health care research and education.

On June 17, 2014, the University Of Calgary Faculty Of Medicine was formally named the Cumming School of Medicine in recognition of Geoffrey Cumming's generous gift to the university.

For more information, visit cumming.ucalgary.ca or follow us on twitter @UCalgaryMed

The Hotchkiss Brain Institute

The Hotchkiss Brain Institute (HBI) at the University of Calgary consists of more than 120 scientists and clinician-scientists who are dedicated to advancing brain and mental health research and education. The Institute's research strengths, in the areas of Brain & Behaviour, Neural Injury & Repair and Healthy Brain Aging, are leading to new treatments for neurological and psychiatric disorders, aimed at improving quality of life and patient care. More information on the HBI can be found at www.hbi.ucalgary.ca.

Alberta Health Services

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