Profile

Greg Albers: changing the face of the stroke stopwatch

Treatment for stroke is determined by the stopwatch. Missing the few hours that are the window of opportunity between stroke onset and the time of diagnosis make many patients ineligible for reperfusion therapy, because of concerns that treatment might be too risky or ineffective. Greg Albers, Professor of Neurology and Neurological Sciences, and Director of the Stanford Stroke Center (Stanford University, CA, USA) is "trying to show that the stopwatch does not make the most sense". He says: "we have to tailor treatment to the individual, not because the majority of people don't do well if you treat them within a chosen timeframe. That will hold for the population in general, but not necessarily for the patient in front of you".

Albers' fascination with the brain started in high school with a particular interest in the way memories are made. As an undergraduate he chose neuroscience at UC Irvine (CA, USA) working with the late Richard F. Thompson, an expert in memory and learning research. Loving the science, but feeling isolated in the lab, Albers turned his focus to neurology to continue to try and understand the brain, but with human patients rather than animals. After graduating in 1984 from the University of California, San Diego School of Medicine (CA, USA), his neurology residency at Stanford University introduced him to Dennis Choi, who was studying why human brain cells in culture die so quickly when the oxygen and glucose supply is cut off, so much more so than other tissue. Albers decided to take Choi's work into the clinic; "Dennis is a phenomenal scientist, who was trying to treat stroke in a petri dish. I am a fan of translational research—I worked on taking the science from a cell-culture model to the patient".

Albers was then invited to join the Stanford faculty in 1989. During his fellowship, he had tested Choi's results, using neuroprotective agents in human studies, and "completely failed". How does Albers deal with failure? "I try to tease apart the results and learn what went wrong", he says. "In this case the drugs were probably too toxic for humans—in fact many of our patients started to hallucinate—a real example of translational research failure." Undeterred, Albers, always mindful of his father's advice of applying "selective neglect, picking what is most important and leaving the rest", had already selected stroke, and specifically stroke imaging, because "the key to understanding this disease is to observe it as it evolves". At that time the only relevant imaging modality was the CT scan. "It was incredibly frustrating because the stroke typically doesn't show up for many hours. The scan could look completely normal, then the damage became evident when it was too late." However, in the early 1990s, radiologist Michael Moseley's pioneering work in diffusion MRI changed the stroke landscape by offering real-time imaging.

"Soon after I joined the Stanford faculty, the few existing stroke-oriented faculty members left and I was suddenly the only stroke doctor", Albers recalls. "I inherited the opportunity to develop a stroke centre and with two colleagues, a neurosurgeon and an interventional neuroradiologist, we evolved as a team and received the first accreditation for a comprehensive multidisciplinary stroke centre in the USA. We are all still here."

Albers is an excellent communicator. He oozes conviction and determination, disseminating his knowledge with ease, but without pretention. Albers and colleagues at Stanford, have developed RAPID imaging software for stroke patients. Now with Food and Drug Administration approval the software is being used in more than 200 stroke centres worldwide, both clinically and in several ongoing research studies. The RAPID imaging maps show tissue that is likely to be irrevocably damaged, and estimate the size of the stroke without reperfusion. Two recent endovascular trials that used the software (SWIFT PRIME and EXTEND-IA) had a more beneficial outcome than studies not using the software.

As the Principal Investigator of the first NIH StrokeNet trial, DEFUSE 3 (NCT02586415), Albers' hope now is that RAPID can stretch the window of opportunity for treatment from 6 to 16 h. "We are trying to understand what is so special about the 30–40% of patients who do really well despite relatively late reperfusion," he says. "Strokes are incredibly heterogeneous so we need real-time imaging to make the best decision for each individual, and not simply use a stopwatch." He also hopes that in the same way as tissue plasminogen activator is a life-saving treatment for stroke patients, mechanical stent retrievers that can extract the non-dissolving clots will also become widely available, even for patients who wake up with a stroke or need to be transferred long distances to specialty centres. However, the process of adopting new treatment approaches can be slow he says, "and we need to get the right treatment to the right patient."

Albers is still very much hands on. He remembers and emulates neurology professor Frank Sharp (University of California San Diego), who would always dedicate time to talk to his patient to pick up important clues. "I divide my time between teaching and mentoring, research and patient care, but I also have a fair bit of administration in my role." He is also a hands-on father to five children; "we do baseball, basketball, swimming, water polo, and ballet. Lots of coaching and lots of cheering". Albers also plays the guitar and a few years ago was a member of an all-neurologist group called the Hypertonics—probably a band of some very fine brains, and neuron-firing music.

Jules Morgan

Lancet Neurol 2017

Published Online
January 5, 2017
http://dx.doi.org/10.1016/S1474-4422(16)30386-6

For **Stanford Stroke Center** see http://med.stanford.edu/neurology/divisions/stroke.html

For more on **RAPID imaging software** see http://www.ischemaview.com/

For the **SWIFT PRIME trial** see *NEJM* 2015; published online April 17. DOI:10.1056/NEJMoa1415061

For the **EXTEND-IA trial** see *NEJM* 2015; published online Feb 11. DOI:10.1056/NEJMoa1414792

For more on **NIH StokeNet** see In Context *Lancet Neurol* 2016; **6:** 549–50

For **DEFUSE 3 trial** see https://clinicaltrials.gov/ct2/show/NCT02586415?term=-NCT02586415&rank=1