Title: A Better Brain Map
Publication: *Castro Valley Forum* and *San Leandro Times*
Author: Glen Jett MSN, RN, BC, NE-BC Administrative Director, Neuroscience Center

From phone lines passing sound, to wires passing electrical current, neuroscientists have developed many metaphors to describe how information is transmitted in the brain and sent to the body. These figures of speech help us talk about the complex structures – neural pathways - hidden inside the brain, and help us appreciate how critical they are to everyday activities.

Using a technique called diffusion tensor imaging, neurosurgeons at Eden Medical Center can not only describe the network of neural pathways in your brain with more clarity, but they can see them with incredible detail too!

A Much Better Map

"Until recently, we've have had to spend six to ten hours, mapping brain fibers one at a time – the equivalent of drawing a topographic map one elevation line at a time," says Jenny Chen, Neuroradiologist at Eden Medical Center. "With new software, we can perform this process for all brain fibers in minutes and use it to guide decisions in the operating room." Moreover, instead of manually moving the map from one system to another – for instance, from the MRI scanner to the operating room tools and monitors – the map is available seamlessly across all systems. This is the equivalent of your phone showing the map you looked up on your computer at home, knowing your location and destination, and lighting up a path between the two.

This fast, full-brain mapping and integration with equipment in the operating room is important because it's these delicate fibers in the brain that control countless physical and mental activities – from allowing you to see and speak, solve problems and process thoughts, to making your muscles move.

Leads to Much Safer Surgery

The skill of neurosurgeons lies in their expertise navigating surgical instruments around healthy tissue, veins, and nerve fibers in the brain without damaging them, which could cause disability. With a complete 3-D map of a patient's brain fibers, surgeons can now maneuver their instruments around these important connections to reach deep-seated tumors and blood clots.

"This technology gives me more options to reach my target without damaging a neural pathway in the process" said Lawrence Dickinson, M.D., Neurosurgeon, Eden Medical Center.

Using new technology called BrightMatter™, surgeons operating at Eden Medical Center will be able to see what was previously hidden or seen in much less detail; reducing the risk of injury and opening up new avenues to remove tumors or repair damaged parts of the brain.

Which Leads to Better Outcomes

This technology can improve outcomes for patients with brain tumors, stroke, head and spine trauma, as well as patients with chronic neck and back pain. This advancement may also offer surgery as an option for patients with conditions previously deemed to be inoperable – bringing new hope for meaningful treatment.

“This technology will revolutionize the way we manage neurological patients,” said Dickinson. “Patients can now have surgery with much less risk of disturbing the important pathways of the brain, and surgeons can reach places they couldn’t before. This advancement may also allow for smaller incisions and shorter patient recovery time.”

Eden Medical Center thanks the donors to Better Health East Bay, a Sutter Health philanthropic foundation, for provided the funding to bring the BrightMatter technology to Northern California.

Glen Jett, MSN, RN, BC, NE-BC is the administrative director of the Neuroscience Center at Sutter Health Eden Medical Center.