~Essay~

I worked in a laboratory studying cerebellar regulation of cardiovascular and respiratory function. The exquisite complexity of neural regulatory pathways was often challenging and sometimes frustrating. But it was always humbling, provoking curiosity and revealing my innate fascination with the nervous system.

As a neurosurgeon I would get to interact with the amazing, intricate detail of the nervous system every day. Furthermore, I would get to learn about unique variations in different nervous systems since no two surgeries are alike. With my team, I would get to spend much time deciding surgical approaches. These decisions are very real because the nervous system encompasses the body's most vital functions. Millimeters can decide paralysis or no paralysis and blindness or sight. Hence, as a neurosurgeon I would be both a scientist researching the best surgical technique and a physician applying the proposed treatment to my patient. I cannot imagine a better job.

Selected Past Research Projects

- 2008 (March-June): Mentored by Dr. Eldo Frezza in the Abdominal Surgery Department at Texas Tech, my research focus was adipose tissue endocrinology and neuroendocrine influence on the gastrointestinal system (2 Publications).
- 2006-2007: Howard Hughes Medical Research Scholar in physiology under Dr. Lorenz Lutherer at Texas Tech, my project focused on hypoxic and hypercapnic cerebellar influences (1 Paper in process of submission).
- 2003-2006: Howard Hughes Medical Research Scholar in biochemistry under Dr. Robert Shaw at Texas Tech. I developed 2 *in vivo* beta-lactamase inhibition assays for beta-lactam resistant primers (1 Publication).
- (Given the word limit details are listed in the CV.)

~ Proposed Research~

Background: Atherosclerosis is a progressive, chronic inflammatory disease defined by a long asymptomatic phase eventually appearing with acute cardiovascular symptoms. Methods currently exist that allow identification of atherosclerosis when it is still in the subclinical stage. Furthermore, we are able to classify intracranial stenosis into categories of low-, medium- and high-grade.

Problem: Literature comparing treatment options for intracranial stenosis is available, yet very few articles or studies discuss long term ramifications of treatment options for patients with high-grade stenosis. This especially applies to angioplasty versus stenting or a combination of both.

What could be found: We could find that stenting or angioplasty has more promising mortality and morbidity rates for patients with high-grade stenosis. Or, we could find that there is no difference in the mortality and morbidity rates between the procedures.

Significance: Results would help patients and their neurosurgeons decide whether to pursue angioplasty, stenting or a combination of both, when treating high-grade intracranial stenosis.

Plan: A retrospective chart review could identify all patients with high-grade stenoses. Variables would be collected including: elective surgical procedure, perioperative complications, necessary re-treatments, complications, age, gender, co-morbidities, mortality and morbidity. These variables would be entered into a spreadsheet and statistical analyses performed in order to identify long-term ramifications comparing angioplasty with stenting in reference to high-grade stenosis.

References:

Qureshi AI, Feldmann EF, Gomez CG, et. al. Intracranial Atherosclerotic Disease: An Update. *Ann Neuro* 2009; 66:730-738.

Patel TR and Bulsara KR. Current Strategies for the Treatment of Intracranial Atherosclerotic Internal Carotid Artery Stenosis. *Neurosurg Rev* 2009; 32:23-28.