

Hands that Heal

Benjamin Carson, M.D.
Director of Pediatric
Neurosurgery
The Johns Hopkins
Children's Center

Johns Hopkins Children's Center



*Ben Carson grew up in a single-parent home in dire poverty, but his mother—with only a third-grade education—challenged him to strive for excellence. That he has. A graduate of Yale University, Dr. Carson is a full professor of neurosurgery, oncology, plastic surgery, and pediatrics at the Johns Hopkins School of Medicine, and has directed pediatric neurosurgery at the Johns Hopkins Children's Center for nearly a quarter of a century. Dr. Carson holds more than 50 honorary doctorate degrees, serves on the President's Council on Bioethics, and in 2008 was awarded the Presidential Medal of Freedom, the highest civilian honor in the land. He is president of the Carson Scholars Fund, which has awarded more than \$3.4 million to young people of all backgrounds for exceptional academic and humanitarian accomplishments. His fourth book, *Take the Risk: Learning to Identify, Choose, and Live with Acceptable Risk*, was released in 2008. Here, Dr. Carson talks about figuring out what you want in life, the future of neuroscience, and what it's like to operate in deep, dark places.*

Finding Focus

From the time I was eight years old, I was interested in medicine, but it changed from one discipline to another. During medical school, I asked myself, "What are you really, really good at?" I started thinking about my life. I realized that I had a lot of eye-hand coordination, the ability to think in three dimensions. I was a very careful person. I never knocked things over and said, "Oops." I loved to dissect things. So I realized psychiatry probably wasn't the right thing for me; I'd been thinking for years that I was going to be a psychiatrist. I said to myself, "You need to do something that takes advantage of your special gifts and talents," which I think God gives everybody.

When I started doing neurosurgery rotations in my third year of medical school, I just felt so comfortable. I clicked so well with the residents and attending physicians that it was sort of like I belonged there. So I said, "Neurosurgery it is."

Respect and Responsibility

The first time I touched a human brain was in the cadaver lab. Opening the skull and the dura and beholding the brain—even now, after all these years—has a certain awe-inspiring quality. It's incredible to see the human brain and to realize that this relatively amorphous mass makes you into who you are.

I have a great deal of respect for the fact that I'm operating on someone's brain. I don't take it for granted. I always ask God to give me wisdom and I always spend time mentally going through, "What am I trying to do? What is my goal here?" You've got to know what your goal is so you recognize it when you get there. Otherwise you might do more than you should do and hurt somebody.

The most humbling thing is that there are a lot of things over which we have no control, things we perhaps understand, but we can't control. For instance, when you're working with blood vessels in the brain, sometimes you can't control whether they're going to go into spasm and starve the tissue and cause a stroke.

Seeing in Deep, Dark Places

There have been massive changes in diagnostics and techniques since I began my career. It's not even the same specialty anymore. The equipment is so much more sophisticated, such as the very high-speed drills with diamond bits that allow us to do extremely fine contouring. Last night, I was doing a case where we had to drill down spicules of bone that were sticking into the side of the brain stem. We never would have been able to do that kind of stuff when I started neurosurgery.

These days, we use monitoring devices that give us impulses and tell us when something is being disturbed too much. With intraoperative ultrasound imaging, we can see fluid waves and determine when we've relieved a constriction appropriately. We have a 3-D wand that is sort of like a "You are here" marquee in a shopping mall. It tells you exactly where you are, which can be confusing sometimes in deep, dark places.

All of that kind of imaging and technology has really enabled us to do things we could only dream about before. I'm sure in another generation technology will have changed another whole magnitude, particularly with the usage of virtual reality workstations and robots. With a da Vinci robot, right now we can take a needle not much different than a strand of your hair in terms of diameter, and drive

Johns Hopkins Children's Center



it through an opening—one that's so small you can barely see it—without touching the sides. You're talking about that kind of precision. Then you can do that repeatedly. Sewing up a hole in an artery—something that can be a difficult task—can be relatively quick and simple.

Our biggest limitation right now is probably the neural pathways, trying to get to places without disturbing the tissue in between. Particularly in the brainstem, the thalamus, places like that, it's very expensive real estate. If you bother something adjacent to what you're working on, the consequences can be profound, so when we can find ways to work specifically on an area without disturbing the areas around it, that will be great.

Into the Future

Going forward, I think the most important need will be in areas of neuroscience research. One of the things that attracted me to neuroscience is that so much was still unknown. I knew you could become an expert pretty quickly—and that's going to continue to be the case because the more we know, the less we know. It's a field that's just so rich for discovery. Being able to translate those discoveries into clinical practice is going to be very exciting.

I think that a lot of the neurosurgery of the future will be done with energy, with lasers and focused radiation and things of that nature, similar to the gamma knife and the cyber knife today. Computerizing those things will actually allow us to target areas without disturbing the tissues around it.

If you saw the *Star Trek III* episode with the whales, they discovered a skull from the 1990s—ancient times—and said, "Look at this, there's evidence of a craniotomy. Can you believe those barbarians were still cutting people's heads open?" I think it'll be something like that.

The Next Generation

For kids who are fascinated by neuroscience, who

may be interested in pursuing a career in it, I would say, study, study, study. Learn how you learn, and don't try to put yourself in somebody else's shoes. Everybody has their strengths and weaknesses, and you need to learn what yours are. If you're a person who learns by repetition, learn how to make flash cards and carry them around in your pocket. If you're a person who doesn't learn by listening to boring lectures, try to limit the number of boring lectures and spend more time working with your flash cards.

Don't be discouraged by those people who talk about how long you're going to spend preparing for a career in neuroscience. You will hear that kind of negativity, because we're in an instant gratification-type society. What you should tell those people is that when you get finished with your neuroscience degree, you'll be the same age as the ones who are nay-saying. Time won't stop for them just because they're complaining about it.

The Most Spectacular Operation

The most significant thing for me is being able to give people longevity and quality of life. People are always asking, "Well, what's the most spectacular operation? Siamese twins, hemispherectomies, brainstem tumors?" The most spectacular operation for me is the last one I did. There's nothing better than being able to walk out in the waiting room and tell the family, "Your loved one is awake and doing well, and the problem is solved." **i**