SPRING 2016

Telling Stories:
The Literary Neurosurgeon

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STORIES FROM A WAR ZONE

30
THE INTERNATIONAL DIVISION: STRONG AND GROWING

Congress of Neurological Surgeons
It is my sincere pleasure to introduce the spring issue of Congress Quarterly (cnsq). In this issue, we will dive into the minds of neurosurgeons around the globe who also have become prolific writers. What motivates them to tell their stories? Who inspired them to write and how has this writing shaped their careers as neurosurgeons? How do they achieve balance in their lives? We interviewed seven accomplished neurosurgeons to better understand what motivates them to write.

Gerald A. Grant, MD

We first hear from Dr. Henry Marsh, who is a consultant neurosurgeon in the United Kingdom and recently published his book Do No Harm: Stories of Life, Death and Brain Surgery. This is a frank and powerful narrative of his life in neurosurgery. Mr. Marsh admits that “as a writer, you’re trying to describe things because you’re involved, but you remain detached and struggle to write objectively.” I had the opportunity of working closely with Mr. Marsh at Atkinson Morley’s Hospital for a year as a senior registrar. We then meet Dr. Lee Warren, who is in practice in Wyoming, and discuss his book No Place to Hide. Dr. Warren and I were partners in the U.S. Air Force and were both deployed to Balad Air Base in support of Operation Iraqi Freedom. Dr. Edison McDaniels, a pediatric neurosurgeon in Arkansas, talks about his most recent historical fiction novel, The Matriarch of Ruins, which is the second of a Gettysburg trilogy. Another interview was given by Dr. Lucy Kalanithi, the wife of Dr. Paul Kalanithi, who died before his book When Breath Becomes Air was published. Paul was a stellar neurosurgery resident at Stanford and touched the lives of so many in his final chapter. We then hear Dr. Eben Alexander recount his experience in coma and near death experience in his book, Proof of Heaven, and Dr. Katrina Firlik recount her memoir of neurosurgery training in Another Day in the Frontal Lobe: A Brain Surgeon Exposes Life on the Inside. Finally, we meet Dr. Brian Andrews and hear about his most recent book, Cherokee Neurosurgeon, a biography of the neurosurgery giant Dr. Charles Wilson, as well as his fictional murder mystery novels.

I really hope you enjoy reading these interviews as much as our team relished getting to know these passionate writers of our specialty. There are many more authors to highlight in future Congress Quarterly editions. Hats off to the Congress Quarterly Editorial Board and specifically Antonia Callas from the CNS office for her time and dedication to this issue.
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PRESIDENT’S MESSAGE

Advance, Adapt, Achieve

Friends and colleagues, I am humbled and honored to serve you as the 66th President of the CNS. The CNS is a vibrant, progressive, and growing international neurosurgical organization, steadfast in the pursuit of its charge:

The Congress of Neurological Surgeons (CNS) exists to enhance health and improve lives worldwide through the advancement of education and scientific exchange. The CNS maintains the vitality of our profession through volunteer efforts of its members and the development of leadership in service to the public, to our colleagues in other disciplines, and to neurosurgeons throughout the world in all stages of their professional lives.

To most effectively achieve these objectives, we continue to adapt to a rapidly changing environment and advance our member interests via emerging educational, advocacy, research, and training opportunities.

Our Members

Our members and their engagement with the CNS are the basis and lifeblood of the organization. With a rapidly growing membership base at all career stages and direct member involvement, the CNS is ideally suited to develop critical initiatives that advance the specialty. CNS membership has grown to over 9,100 members, with 3,700 Active members, over 1,200 International members, and 1,800 Resident members (both United States and International). The CNS is led by members that volunteer their time, effort, and resources to most effectively and efficiently advance CNS initiatives and specialty goals. To that end, the CNS remains committed to developing leaders across our specialty and seeks volunteer members to impact, develop, and grow organizational initiatives. If you are interested in volunteering, visit cns.org/volunteer.

CNS Publications

A cornerstone of the CNS educational effort and a vital member resource are our publications. Under the excellent leadership of Editor-in-Chief Nelson Oyesiku, MD, (Figure 1) our journal Neurosurgery® has reached unprecedented heights. The latest impact factor is at a historic high of 3.62, which places Neurosurgery® among the premier surgical journals worldwide. Dr. Oyesiku continues to innovate and evolve the journal in a number of fundamental ways that will continue to distinguish it as a leader in medical publishing. Imminent changes include the development of a new platform for seamless integration of various content formats (customizing content for individual readers), the creation of a new technique and case-based journal, Operative Neurosurgery: The Surgeon’s Armamentarium (Figure 2), and the integration of interactive journal content into the CNS Annual Meeting.

CNS Annual Meeting

The CNS Annual Meeting provides an outstanding and essential opportunity for educational, scientific, and social exchange. The 2016 CNS Annual Meeting will be held in San Diego, California, September 24–28, 2016. We’re pleased to announce that this year’s meeting will take place in conjunction with the Tumor Section Satellite Symposium, September 23–24. For members preparing for their Oral Boards, the CNS Oral Board Early Review Course will also be held in San Diego, concurrent with the beginning of the Annual Meeting.

I am incredibly proud of and grateful to the Annual Meeting leadership team, which includes Annual Meeting Chair Steven Kalkanis, Scientific Program Committee Chair James Harrop, and Scientific Program Committee Vice Chair Brian Hoh. The meeting theme Adapt, Advance, Achieve underscores our ability to successfully navigate changing practice, research, and training environments.

An unprecedented number of innovations to the 2016 CNS Annual Meeting have been developed to greatly expand and enhance attendee interaction and educational opportunities. Specifically, the Annual Meeting will now include high-impact rapid oral presentations, the incorporation of a Neurosurgery® special speaker, Operative Neurosurgery live surgery sessions, expanded General Scientific Sessions, year-in-review sessions (highlighting the most important specialty papers of the previous year), and guidelines sessions (updating attendees on critical emerging practice guidelines).

These changes are layered into the backdrop of an exceptional ensemble of featured speakers who are innovators and leaders in technology,
sports, literature, and history. We’re pleased to welcome Steve Wozniak, co-founder, Apple Computers; Billy Beane, executive vice president, Baseball Operations, Oakland A’s; Daniel James Brown, New York Times bestselling author of The Boys in the Boat; and Viktor Mayer-Schönberger, international bestselling author of Big Data: A Revolution that Will Transform How We Live, Work, and Think. We also welcome neurosurgical leader and this year’s Honored Guest, Edward H. Oldfield, MD.

This year’s international partner collaborator is the Continental Association of African Neurosurgical Societies (CAANS). CAANS represents African continental neurosurgery, and like the CNS, promotes global improvement in neurosurgical care. We are honored and delighted to have CAANS as our 2016 Annual Meeting partner.

**Neurosurgical Advocacy**

Advocacy that promotes public welfare through the advancement of neurosurgery is a critical focus of the CNS. Neurosurgery advocacy is principally conducted via the Washington Committee and Council of State Neurological Surgeons (CSNS). Under the leadership of Katie Orrico, JD, the Washington Committee has been critical to repealing Medicare’s sustainable growth-rate physician payment system (which prevented a 21 percent pay cut). It has ensured that neurosurgical procedures are appropriately valued, preventing the inappropriate devaluation of neurosurgical services, and has guaranteed that Emergency Medical Treatment and Active Labor Act (EMTALA) regulations are reasonable and do not expose neurosurgeons to penalties and fines. The committee has also led successful efforts to influence reports issued by the Institute of Medicine such as recommendations regarding the regionalization of emergency neurosurgical care, resident duty hours, and graduate medical education federal support.

**Research Partnership with National Institutes of Health (NIH)**

To develop new strategies that most effectively advance research and scientific knowledge, the CNS has embarked on an unprecedented collaboration with the Foundation for the NIH and the National Institute of Neurological Disorders and Stroke (NINDS). Starting this year, this partnership funds the NINDS-CNS Getch Scholar K-12 Award. This innovative award provides two years of support ($100,000 per year) to a young neurosurgeon within two years of finishing residency or fellowship. The K12 program is the most successful NIH program for developing young neurosurgeons to date. The first recipient has been announced as Brian Dlouhy, MD, from the University of Iowa. His topic of study is “Amygdala control of breathing during seizures—understanding mechanisms of sudden unexpected death in epilepsy (SUDEP)” (Figure 3).

**CNS Educational Products**

The CNS continues to develop and grow its educational portfolio and member educational services under the leadership of our Education Division Chair Bernard Bendok, MD. It is a high priority to offer critical educational resources for members at all stages of their careers. These include webinars that span all subspecialties, an innovative Oral Board Exam Preparation Early Review Course, targeted courses at the Annual Meeting and throughout the year that deliver results based on defined knowledge gaps, the top-notch SANS (Self-Assessment in Neurosurgery) testing, and resident boot camps that enhance skills/knowledge at defined years in training. An important new initiative is to offer practice-based courses for leadership, coding, and practice management.

**Future**

The impact of the CNS for its members is powerful. It spans education, advocacy, research, and training. Organizationally, we will continue to adapt our strategy, advance our member mission, and achieve critical goals for our specialty.

We look forward to seeing you at the CNS Annual Meeting in San Diego this September!
In these deeply personal interviews, seven neurosurgeons share their innermost thoughts and the questions that drive them to write: what makes us human, what is consciousness, how do we build meaning and value in our lives? These successful authors offer inspiration, encouragement, and practical advice about what it takes to write a compelling narrative.

“The role of a writer is not to say what we all can say, but what we are unable to say.” — Anaïs Nin
Neurosurgeon and award-winning author Henry Marsh, MD, speaks to the Congress Quarterly about his New York Times bestselling book Do No Harm: Stories of Life, Death, and Brain Surgery (2014). In this frank and powerful narrative, Dr. Marsh delivers an intimate account of his life in medicine’s most difficult art. With complete candor, he reveals the joy of operating; the profoundly moving triumphs, the harrowing disasters, the haunting regrets, and the moments of black humor that characterize a brain surgeon’s life.

Dr. Henry Marsh is senior consultant neurosurgeon at the Atkinson Morley Wing at Atkinson Morley’s/St. George’s Hospital in South London. He studied medicine at the Royal Free Medical School in London and was a fellow of the Royal College of Surgeons. In 2010, he was made a CBE (Commander of the Order of the British Empire). He has been the subject of two documentary films, Your Life in their Hands, which won the Royal Television Society Gold Medal, and The English Surgeon, an Emmy-winning film based on the problems Marsh and Ukrainian colleague Igor Kurilets encountered doing neurosurgical work in a Ukrainian hospital. He spends his spare time making furniture and keeping bees.

Congress Quarterly:
What motivated you to write Do No Harm?
Dr. Henry Marsh: It basically is a reworked version of a daily diary I have kept ever since I was 12 years old. In effect, I’ve been writing all my life. I suppose in some ways I’ve always had a compulsion to write. My second wife, Kate Fox, prodded me. She’s a very successful writer and anthropologist, and wrote a book called Watching the English, which sold a huge number of copies. I used to read bits of my diary to her. And she said, “That needs to be a book.” I went to see her literary agent and that’s how the book came about. It is basically my diary, but written and done up in a book form.

CQ: How long did it take to transform the book from its form as your diary into the released novel?
HM: It was about 10 years between the decision to turn it into a book and its publication.

CQ: Were you ever hesitant to turn this into a public work?
HM: No, not really. I knew I was doing something unusual, but I was writing for myself, and I didn’t think about whether it would be successful or not.

CQ: Did you have any inkling that Do No Harm would have the critical reception it has received? Do you have any theories on why it has become so widely acclaimed?
HM: I never thought it would become as successful as it has been. There are now over 20 international editions and translations; it’s been a New York Times bestseller and a bestseller in England and Germany. But I didn’t really think about that. But I knew I was doing something unusual. I’ve read a fair number of medical memoirs and I never felt I’d read one which really showed what it was really like to be a surgeon doing, essentially, very dangerous surgery. We learn at a very early stage in our careers to pretend to patients that we’re more knowledgeable and more competent than we are. To a certain extent, that’s what patients
want. As a young doctor, you can’t very well say, “I don’t know what I’m doing.” As you get older, you can be a bit more honest. But a lot of doctors aren’t. And those doctors who have written memoirs tend to maintain this sort of mask, this charade. So, I knew I was doing something unusual with the book, but I hadn’t thought much beyond that.

**CQ: Do you think your willingness to take off that façade in your writing that so many doctors retain contributed to your book’s success?**

**HM:** Without a doubt. From the many reviews, letters, and emails I’ve received—it is the honesty. That’s obviously very unusual. People clearly know that doctors aren’t honest. If all doctors are technically honest, to their patients and themselves, there’d be nothing all that special about the book. The other reason, in a sense, almost unconsciously, is zeitgeist, the spirit of the age. In England and in the United States, too, doctors are working in an increasingly critical, if not hostile, environment. A huge contrast to when I went into medicine 40 years ago. And I don’t see this as necessarily a bad thing. I’ve always felt one should treat patients as equals, as you’d wish to be treated yourself. If patients want to be treated as adults, they must understand that doctors are human as well. There’s always been a tendency for patients to regress to child-like roles with doctors; they’re frightened of doctors as patients. I’m always telling my trainees, “Your patients are frightened of you.” You think you’re this nice, kind, philanthropic, competent guy. But your patients are frightened—particularly of surgeons. It’s a very unequal relationship. I think the idea of having a profession, which has taken big knock certainly in this country (England), is the idea of trust. You trust people, you assume they’re honest. So in one sense, by saying I’ve often made serious mistakes and I’m often very anxious and frightened, I’m being honest. Perhaps patients respect and trust me more as a result, instead of being a god-like figure who never makes a mistake.

**CQ: Has your writing ebbed and flowed with your life? Or has it been a constant presence?**

**HM:** It’s changed, it’s changed. When I was a teenager, it was a load of morbid, narcissistic navel-gazing. Later in my medical career, one sees the most wonderful and terrible things as a doctor. Particularly as a brain surgeon. And there is this deep and fundamental mystery about the brain and how physical matter generates consciousness. And we haven’t a clue! We haven’t even begun to explain it. You’re dealing with extraordinary life and death mysteries, dramas and tragedies. And when you go and work in countries like Ukraine and Nepal and Albania, you have a very interesting life.

One of the problems with being a doctor is that you’re always trying to damp down the excitement. It’s the asymmetry of our relationship with our patients. For our patients, their encounter with us is among the worst experiences of their life. For us, it’s another day at work. Anxiety is contagious; we don’t like anxious patients, so we try to play down the drama. But at the same time, it is the drama and it is the incredible importance of medicine which makes it so attractive. With writing, particularly in my later years, I didn’t want it to slip through my hands. I wanted to try to describe with words what I feel and do. It was for myself.

**CQ: Is writing an outlet that verbal communication isn’t?**

**HM:** Certainly with patients, there are lots of things you don’t communicate. What one writes in a book is going to be quite different. This book is only one I could have written toward the end of my career. I couldn’t have written or published this book years ago. I would have felt far too vulnerable. Because I’m very senior, I can, in a sense, take the risk of writing a book like this and be respected for it, rather than demolishing myself with it. For me the book is not a confession; a confession is something you feel guilty about. This is trying to understand why I got things wrong, trying to understand myself, and also trying to set an example for other doctors to realize how easy it is to make mistakes. When I was a young consultant and had my first disasters, either through mistakes or bad luck, I found it quite reassuring to remember some of the guys who trained me, whom I greatly respected. I’d seen them make mistakes occasionally, and I found that quite helped me cope with the overwhelming sense of guilt I experienced. In recent years, when things went badly and I blamed myself for it, I still felt awful about it, but only for a few days. When I was younger, I’d feel terrible for weeks on end, although one went on working in the way one does.

I was very struck after the American edition came out. I got quite a large number of letters or emails from very senior guys, like the late John Jane, and they really liked the book. I was amazed; I thought the Americans would say he’s just another incompetent limey. He doesn’t know what he’s doing. Most of the letters I got from surgeons were from people after they retired. Only when you’ve retired can you let the defenses down a bit and admit just how emotionally difficult the work can be. And a lot of the time you have to pretend to yourself in order to cope with the bad side of things. Again, in a very high visibility, superficially glamorous specialty like brain surgery, the triumphs are only triumphs because there exist disasters. If the operations always went well, never went wrong, there’d be nothing very special about it. You can’t have one without the other. Both to keep patients happy and to keep doctors’ egos happy, the tendency is to hide the bad side of things. As with everything in life, particularly in medicine, we learn much more from mistakes than we do success.
Success is dangerous; success makes us complacent and corrupts us. You know, it is very difficult to admit to mistakes, even to one’s self. As doctors, the consequences of our mistakes are so bad and horrible, it is very tempting to say things like, “The operation was a success, but the patient died.” It’s being a bit more honest, at least to one’s self.

CQ: You mention that it was often retired surgeons, or those toward the end of their careers, who wrote to you about their agreement with the book. Do you think it’s possible for a surgeon in the peak of their career to step back and “let the defenses down” as you mention?

HM: I think it’s very difficult. But I think some insight into one’s self is surely a good thing. Because we learn from mistakes and we all make mistakes, however good we are. The best surgeons are very experienced, and experience is about making mistakes and learning from them. It is normal to make mistakes, and one shouldn’t feel too bad about it. The important point is to learn from it, and if you’re a senior doctor, to make sure your trainees don’t make the same mistakes. In other words, set an example by being open and honest. In principle, that happens in M&M meetings, but in my experience, M&M meetings are often pretty meaningless. They can be quite good, depending on who’s running them. But they often don’t really have an impact. While we subscribe in theory, as surgeons, to this belief in open discussion, it doesn’t always happen.

CQ: Neurosurgery captures the attention of the public, even though it is a field that very few will ever truly know.

HM: There’s this huge myth about brain surgery. People think it’s terribly difficult—the steady hands thing. I think most surgeons would admit that operating is the easy bit, once you know what you’re doing. The problems are all psychological; problems with decision-making, problems with dealing with bad results. The public are right to think neurosurgery is difficult, but they’re wrong as to why.

CQ: Do you think neurosurgeons have any obligation to help others understand our field?

HM: I think we all have an obligation to explain and educate as best we can. It is often very difficult, particularly if you work in very uneducated, very poor countries. For instance, in Nepal, where there’s no understanding of the brain, the families of the patients don’t understand the idea of brain damage. They think of it like any other illness, and that all operations are the same. It’s very difficult when there are deeply ingrained cultural values and beliefs.

CQ: Has any of the correspondence you’ve received really stuck with you?

HM: I’ve received quite a lot of email from previous patients. Sometimes it seems I beat myself up more than the patient’s family did when things went badly. They were less critical of me than I was myself.

CQ: Could you describe how you’ve grown and developed as a writer?

HM: After starting the process of writing the book, it was looked at by my agent, editor, and publishers. I showed it to members of my family and friends, and got lots of comments and criticism. When I look at books nowadays, particularly the acknowledgements, people are always thanking many people. It is often very important to show what you’re writing to other people. I’ve learned a huge amount, especially from my wife, who’s a very good writer and a very good critic. So, my writing has gotten a lot better because of lots of benign criticism. There are two rules in trying to write well. One is to show, not tell. I try to show things, describe things, rather than pontificate and preach. The other is to never use two words when one will do. Always try to keep things as simple as possible.

CQ: Are there authors you look to, that you particularly enjoy?

HM: I come from a very bookish family. I read an awful lot and have done so since I was a child. I think it’s very hard to be a good writer if you haven’t read a lot. I think reading a lot is very important. If you ask for particular names, they’re rather obscure. I like writers who write in a rather simple manner. There was an English travel writer, Normal Lewis, who is a great stylist and writes beautifully. I love his books. There are many people’s books I read.

CQ: Are there any similarities between writing and operating?

HM: That’s difficult to answer, as they’re both aspects of the same person. At first glance, there are not too many similarities beyond the importance of lucidity and clarity—knowing where you’re going is invaluable in both. I do woodworking and keep bees, and I’m a very practical person. I see parallels there with operating, but those are quite different from writing.

There is a tone I’m trying to get in my writing, which I found in Norman Lewis’s writing, of both compassion and detachment. This is reminiscent of the balance I sought in operating, as a surgeon. As a writer, you’re trying to describe things because you’re involved, but you struggle to remain detached and to write objectively.

CQ: What advice would you give to a neurosurgeon who wants to start writing?

HM: If you want to write, you have to sit down and start writing. Show it to other people who are good critics. Don’t keep it to yourself, discuss it. People go to creative writing courses, and what that largely consists of is sitting in a room with other people and reading what you’ve written to see what they say. Exposure of what you write is very important.
A Brain Surgeon’s Long Journey Home from the Iraq War

W. Lee Warren, MD, is a writer, neurosurgeon, inventor, and Iraq War veteran. His book No Place to Hide (2014) is a #1 Amazon bestseller. Now a retired major of the U.S. Air Force, Dr. Warren served our country for 14 years and was deployed to Iraq in 2004, during Operation Iraqi Freedom. He was the second neurosurgeon to be deployed since Vietnam. At the 332nd Air Force Theater Hospital at Joint Base Balad, Iraq, he was trained in a different specialty—surviving over a hundred mortar attacks and repairing the damages of a war that raged around every detail of every day. No place was safe, and the constant barrage wore down every possible defense, physical and psychological. Lee Warren’s story is an example of how a person can go from a place of total loss to one of strength, courage, and victory.

Dr. Warren practices minimally invasive brain and spinal surgery, develops new technologies with his wife through their company, Warren Innovation, and is an affiliate professor of biomedical sciences at Auburn University. In his spare time, he plays guitar, writes songs, and recently completed his first novel, Kill Switch.

Congress Quarterly: What inspired you to enlist in the Air Force and to become a neurosurgeon?

Dr. Lee Warren: I’m from a small town in Oklahoma, and I was looking for options to finance my medical education. The opportunity for a military scholarship came up, which was exciting to me, as there was some military history in my family. I was offered the scholarship in 1991, and was commissioned as a second lieutenant before I even started medical school. I went into medical school thinking I was going to be a family medicine doctor. In my third year of medical school my son was born, and I needed to change my schedule. The only rotation available was neurosurgery, which I knew nothing about. The first day the chief resident let me drill burr holes on a two-year-old sagittal synostosis patient. I was hooked from the first time I put the perforator in my hand. I did two more rotations in neurosurgery and was fortunate enough to match in neurosurgery at Alleghany Hospital in Pittsburgh.
CNSQ: You are involved in many things—your busy practice, your work in innovation, and your writing. What has inspired you to explore these different directions?

LW: I think I’m bent towards doing more than one thing. I’ve always had a lot of interest in writing and music, among other things. There has to be balance in life. I think we’re all spiritual, physical, emotional, and practical beings, who have all kinds of different skills we can develop. If you focus your whole energy on one aspect of yourself, then I think you tend to miss out on a lot of what’s great about life.

CNSQ: When you enlisted and joined the Air Force in medical school, did you ever think that you would ever be in a war zone operating?

LW: No, not at all, because when I enlisted in 1991, it was peacetime. The whole time I was enlisted, until 9/11, we were at peace. Even after 9/11, up to when I was ultimately deployed in 2004, the philosophy of the U.S. Air Force was that the people who are hurt badly enough in the field to need a neurosurgeon probably weren’t going to survive long enough to get to one. There weren’t very many neurosurgeons, maybe only 12 in the whole U.S. Air Force. The thinking at that time was that the neurosurgeons should be stationed in Germany or in the United States. Then, in early 2004, the Air Force realized that soldiers were getting to the field hospitals much more quickly with excellent on-the-ground care and medevac, and they needed all the specialists in theater to save lives. By the end of 2004, I was in the air. All of a sudden it was, boom, “You’re going.”

CNSQ: What was going through your mind before you left for Iraq? What were you expecting and what did people tell you about what it would be like to be there in that capacity?

LW: That’s an interesting question, because we really had very little information about what we were getting ourselves into. The Army had been carrying the medical mission for Iraq and Afghanistan since the start of those wars. Then it was decided that the Air Force would take over the combat support mission. In September of 2004, the Air Force deployed Dr. Peter Lenners, who had a practice in Denver. He was the first U.S. Air Force neurosurgeon to be deployed to Iraq, and I was the second. So there wasn’t a lot of information coming back about what was happening. I really left without a clear sense at all of what I was going to experience once I got there.

CNSQ: What was an average day for you like in Iraq, if there was such a thing?

LW: We were in a war, so it was hard to have any kind of routine because the purpose and the mission of that hospital was to take care of trauma, Wearing a holstered 9mm handgun in the OR. On Iraqi Election Day 2015, doctors were ordered to be armed at all times.

Medics unload a casualty from a Black Hawk Helicopter, Balad Air Force Theater Hospital, Iraq, 2005.
and the very frequent mass casualty events. Whenever a bomb would go off or a battle would occur, we would get 10 to 30 patients in the ER at the same time. You never had a sense of knowing what a day might hold. But it was a typical hospital in the sense that we had operation rooms and ICUs and regular nursing pools. We made pre-operative rounds and had critical care rounds like you do in any normal hospital, except we’d be wearing body armor and carrying side arms and waiting for the next mortar to land.

CNSQ: You tell a vivid story on the NPR series Snap Judgement of having to make this very difficult decision. A Marine and an enemy combatant came in with severe traumatic brain injury at the same time and posed a dilemma. How do you recollect that experience?

LW: It was a really exciting and difficult day for all of us. Dr. Todd Abel was the other neurosurgeon that was there with me. Dr. Abel was operating on a soldier when two new patients, an American soldier and a terrorist, came in. They both needed surgery, and we only had one set of instruments left. I made the decision to take both patients into the operating room at the same time, hoping that by the time I got done dealing with one, Todd would be available to help with the other, and it turned out that he was. Since we had only one set of instruments, we shared them. The nurse would pour alcohol on them and clean them as best she could. I tried to do everything I needed to do with my patient before I handed an instrument off to him. We got both of those patients through it, and fortunately neither of them developed a brain infection or anything terrible.

That incident has remained as one of the most important lessons I’ve learned in neurosurgery. In America we have a gross excess of everything—all the blood product we need and every instrument available. In Iraq, despite the fact that we were limited, we were still able to do high quality work, which made me realize that none of us should be primadonnas about what we have, and yell and scream when we don’t have everything we want. You can do a good job with the instruments that you have available to you. Also, solving a complex problem is always possible if you put your mind to it. Todd and I collaborated and figured out what to do. We took care of those two gentlemen, and both of them survived. That’s a great lesson for all of us.

CNSQ: What were some of the kind of cases you did there?

LW: Far and away the most common case was penetrating brain injury. We had all kinds of bombs going off. The American soldiers generally had body armor, protective gear on the torso, and usually helmets. Many of the injuries tended to be to the extremities, so the orthopedic surgeons were really busy. Even the ophthalmologists were really busy. There were a lot of projectiles coming from ground level that would penetrate through the facial bones and occipital bone and get under the helmet and penetrate into the skull. We had lots and lots of penetrating, low-energy projectile brain injuries.

One of the first things we learned is that the CT scan in Iraq doesn’t really tell the same story that it does in the United States. For example, most neurosurgery residents in the US think that a gunshot that crosses both hemispheres usually portends a poor prognosis because of the energy involved in a gunshot. However, the penetrating brain injuries in Iraq were from projectiles at a lower velocity. You would have CT scans that looked horrible, but the patients were awake and looked a lot better than you thought they would. We did a lot of retrieval of fragments, debridement of necrotic brain, a lot of complex cranial, facial fracture repairs, and CSF leak repairs. Those were routine cases for us. We also did a fair amount of spine trauma. Typically, for American soldiers, we would stabilize them and send them back to the U.S., but for the Iraqis and the terrorist and insurgents, we had to do cervical and lumbar fractures and more complex operations fairly frequently.

CNSQ: What was it like operating on patients who were fighting for the other side?

LW: It was really difficult. For example, there was a baby that the pediatric surgeons were taking care of that had been burned terribly all over her body after her house was fire bombed. The person that we thought was responsible was apprehended and injured in a firefight, and we were taking care of him also. It was difficult to justify taking care of him, but a few days later we learned that was just an innocent bystander. Here we’d been judging this guy and feeling bad about taking care of him, and he
was actually innocent. It made me realize right then that it wasn’t our job to decide whether somebody deserved our care or not. It was our job to do our best. That set us free emotionally. We took care of whoever was put in front of us and let God take care of the judgment.

CNSQ: You’ve published this amazing book based on your experiences in Iraq, and it has been inspiring for so many people. How did your literary career affect your career as a neurosurgeon and vice versa?

LW: Writing taught me about the importance of story—you remember every good book you’ve read because it tells a good story. Taking that approach to neurosurgery, with every patient we encounter, we get an opportunity to step into their story and to change how that story plays out. Neurosurgeons can turn somebody’s life into a happy ending or tragedy and dramatically affect how their story plays out. I like to think about my career not as a collection of scans and patients with various pathologies to treat, but rather as human beings that are living out a story. I think that’s really affected how I’ve perceived my career. As a writer I try to craft a story that both moves and affects the reader, and as a surgeon I try to have the greatest positive impact I can in the patient’s life story.

CNSQ: What advice can you give to residents and practicing neurosurgeons on how to contribute and serve, deal with stress, and find the motivation to continue doing interesting things with your life?

LW: You can contribute by never accepting anything just because you’re told, “That’s how it is.” Even when somebody hands you a Penfield 4 and tells you how to use it, you should ask, “Why?” Ask why it’s built that way, why it’s shaped that way, why it’s twisted that way. That will help you begin to think of how you could make it better. That’s what led me into the technician innovation—thinking about why Penfield designed that dissector the way he did. Those questions will lead you to discovering new ways to do procedures, new ways to build instruments, and new ways to solve problems.

You need to serve your patients’ interests above your own, always. Keep your family in mind. If you really want to serve your fellow man and your family, you have to be a human being who is also a neurosurgeon. You are not a neurosurgeon first. You’re a person first. That will help you find balance in your life. Remember that neurosurgeon is what’s on your coat, but it’s not who you are.

I know that dealing with stress is a difficult thing. Most of us, I think, are bent towards being top-heavy people, and we end up working all the time. There’s a reason God took a day off in the creation story. He was modeling for us the idea that you can’t be an effective person in any area if you’re not getting enough sleep, enough rest. Strive for balance in your life above all else, and that will help you manage stress. You’re going to see some difficult things in your career. You’re going to lose some patients, and you’re going to have some moments in your career where you have to deal with some very hard things.

If you’re a neurosurgeon or training to be one, you’ve been given an opportunity to do and see things that few people in the world ever will be able to do. It’s an incredible blessing to look through the foramen and Monroe into the third ventricle. It’s a blessing to be able to be in the CPA and see the cranial nerves and all those arteries. You should be motivated by that. There’s a verse in the Bible that says, “To whom much is given, much is required.” You’ve been given this amazing opportunity. Go out into your career and do something great, because something great has been given to you.

To hear Dr. Warren’s podcast Cross to Bear visit his blog: www.wleewarrenmd.com.
Edison McDaniels, MD, is an accomplished neurosurgeon and an equally gifted writer. His stories center on historical fiction, surgical thrillers, and the supernatural. His writing has been called magnificently harrowing and unforgettable. His most recent novel, *The Matriarch of Ruins* (2015), follows a widow and her family caught in the maelstrom of Gettysburg, and is the second of a trilogy that began with *Not One Among Them Whole: A Novel of Gettysburg* (2012), written from the eyes of the wounded and their surgeons during the Civil War. Dr. McDaniels’ work has received honorable mention in the *Year’s Best Fantasy and Horror: Seventeenth Annual Collection*, and has been published in a wide variety of literary magazines. A number of his short stories can be found online, and he maintains an active presence on *Neurosurgery 101—the Blog*, which chronicles his work and thoughts. Dr. McDaniels is a graduate of Stanford University and received his neurosurgical training at the University of Minnesota. He specializes in pediatric neurosurgery. He currently resides in Arkansas with his wife, Jean, and their children. They collect historical etchings and attend at least one baseball game a week between April and October (more, if the Minnesota Twins are in town).

**Congress Quarterly:** What inspired you to write? And specifically, how did historical fiction come to the forefront?

**Dr. Edison McDaniels:** I’ve been writing as far back as I can remember. I’ve always been fascinated by how words go together, especially in telling a story. My parents played a big part in that. They were tremendous readers. Our home was crammed with books in every corner, on shelves made of cinderblock and wood. We could hardly get down the hallway. Many of these books were on military history—my father’s passion. He was a strict disciplinarian, but if we got him talking about military history he lightened up. We talked about it a lot.

**CQ:** Who impressed you most with their writing, and what are your favorite books?

**ED:** I read most of the classics (*Moby Dick, The Last of the Mohicans, Frankenstein, The Scarlet Letter*, etc.) growing up, but by far Stephen King was my biggest influence. I have read every one of his novels and most of the short stories. *Salem’s Lot* and *Pet Sematary* are two of my favorites, though *Delores Claiborne* is his best for pure storytelling. Another huge influence is Cormac McCarthy, whom I consider the best American novelist alive today. I like writers like McCarthy, writers who show us how words should be used. *Cold Mountain* by Charles Frazier is also like that, with an opening paragraph that is pure poetry. Charles Dickens, too. Try reading *A Tale of Two Cities* without marveling at the writing. You can’t do it. Most people know the first line of that novel: “It was the best of times...” You can’t do better as a writer than to open any page of Dickens and study it. Those are the kind of books I love to read. As a writer, I am always studying the writing.
CQ: Could you elaborate on the extent and kind of research that goes into writing?

ED: Research is an essential part of telling a good story, and with the Internet it's easier than ever to do. It's one of the reasons so many people think they can write today. But the secret is not in doing the research, it's how it's used. Too many writers use research as a club; they try to use everything they find. A better strategy is to research the hell out of your subject (time frame, the culture, names, occupations, medicines, weather, etc.), but be judicious in what actually makes it into your story. The stuff you don't use isn't wasted because it goes toward the story as a whole, allowing the writer to create the ambiance surrounding the characters and the atmosphere. In addition, good research prevents embarrassing errors or moments that take a reader out of a story. You can't have a good story without good research. On the other hand, a lack of research will screw you almost every time. It's like knowing the anatomy before operating. If you want to be a good surgeon, it isn't sufficient to know the anatomy. But it is absolutely necessary.

CQ: How do you balance your writing commitments with clinical and academic responsibilities?

ED: What you are really talking about here is time management, and that's just a matter of priorities. My patients come first every time, obviously. But I've been a surgeon for a long time, and most of what I do is pretty routine. I carry an iPad with me always, and in the little moments of downtime I have, I read. If I have more than a few moments and the situation allows, I might even edit something I'm already working on. Mostly though, it's the decisions I make in my after hours that make a difference. I choose not to watch TV and prefer to write late at night. Something about the night speaks to my muse.

CQ: Has writing influenced your neurosurgical practice?

ED: I probably pay closer attention to the social aspects of my patients’ lives than the average neurosurgeon. I am always looking for inspiration and characters. For example, if someone has a peculiar speech pattern I’ll jot a note about it for future use. Or maybe if they move with a limp from a childhood injury I’ll ask about it. The details of such things interest me and might eventually make it into one of my stories—though in a completely unrecognizable form to the original individual.

CQ: What draws you to the American Civil War for the subject of your works? Is there a personal story behind the stories?

ED: I like stories about ordinary people in extraordinary circumstances. The Civil War is full of such situations. It’s that simple.

CQ: How hard is it to find a publisher? What eventually worked out in your favor?

ED: It's very difficult to get published nowadays. The acceptance rate to review the first few chapters of something you have worked on for a year or more might be no more than one or two percent. And it's very subjective. The editor could be having a bad day or missed their coffee or purchased a similar story the week before. Two things worked for me: perseverance and patience. My first break came when I gave a reading at a writer’s conference. David Poyer, the USA Today bestselling writer of contemporary nautical fiction, was in attendance and caught up with me afterwards.

CQ: What are you reading nowadays? Does Edison McDaniels the reader differ from Edison McDaniels the writer?

ED: I am currently reading Pure, by Andrew Miller, about the relocation of Saints Innocents Cemetery in Paris in 1785. A marvelous piece of fiction from an outstanding writer. I read a wider range of stories than what I write.

CQ: Would you able to shed some light on your next project? Of course, without spoiling the suspense!

ED: A sort of haunted hospital story. A surgeon mercy kills his patient after an operation goes bad. Later, the patient returns. But he’s not seeking revenge. For the rest, you’ll have read the novel.

CQ: What would you like to tell budding “neurosurgeon writers” who would like to emulate your success one day?

ED: Both the surgical task and the writing craft are goal-directed, cerebral undertakings, but surgery is a left-brain, concrete, “get it done right now” thing, and writing is a right-brain, creative, “take your time thing.” Surgery requires rote knowledge of anatomy; writing calls up an esoteric awareness of words and grammar. Surgery is relatively quick and mentally (and often physically) exhausting; writing is time-consuming and brain-building. Surgery involves a team (no surgeon operates alone), though it is an intensely isolating feeling to be deep inside somebody’s brain and know his or her entire future depends on your next move, and your next, and your next... Writing may be one of the most solitary things we humans do, yet when done well it yields a community like few other pursuits.

Edison McDaniels’ books and short stories are available on Amazon, and more information about his work can be found at his website surgeonwriter.com.
Paul Kalanithi, MD, was a neurosurgeon, a writer, and a great friend of mine. Paul grew up in Kingman, Arizona, and attended Stanford University, where he graduated with a BA and MA in English Literature and a BA in Human Biology. He earned an MPhil in History and Philosophy of Science and Medicine from the University of Cambridge before attending medical school. In 2007, Paul graduated cum laude from the Yale School of Medicine, winning the Lewis H. Nahum Prize for outstanding research, and membership in the Alpha Omega Alpha medical honor society. He returned to Stanford for residency training in neurological surgery and a postdoctoral fellowship in neuroscience.


Paul died in March 2015. He is survived by his wife, Lucy Kalanithi, MD, and their daughter, Cady. When Breath Becomes Air was published posthumously in January 2016, and debuted as a #1 New York Times bestseller. Lucy, who wrote the epilogue to Paul’s book, is one of his greatest champions and an incredible friend. It is an honor for me to speak with Lucy about Paul, and all that the two of them have accomplished together.

Congress Quarterly: Thank you so much for spending time with us today. Lucy, the whole world now knows how incredible a writer Paul was. When did you first experience or learn of Paul’s eloquence and mastery of the English language?

Dr. Lucy Kalanithi: Okay, let’s go way back. I met Paul during our first year of medical school at Yale in 2003. We were in the same medical school class. Initially, I knew he was a very smart and intellectual guy—he was running a bioethics seminar with another student, and was clearly an advanced writer. Paul went on a trip with his family to India over the first winter holidays when we were students, and he wrote this unbelievably long, hilarious, really insightful set of emails that he called travelogues. Actually,
later, in retrospect, he told me it was a way of seducing me, because he sent them to a whole group of friends, but he wanted me to be impressed by his writing as we were starting to become more interested in each other. And it totally worked. He never wrote a boring email, or even a boring word. Almost everything he wrote was gold; really funny and insightful. He always thought he would be a writer, well before he decided to enter medicine and then neurosurgery. He was also relatively prolific in scientific literature. He couldn’t get enough of the written word.

**CQ: How about Paul’s love for reading? I know neurosurgery residency is strenuous, and he probably didn’t have much time to read, but when he did have a break, what did he read?**

**LK:** Paul studied English literature and human biology at Stanford. In his book, he said, “I felt that literature provided the best account of the mind, and neuroscience laid down the most elegant rules of the brain.” Initially he dreamed of becoming a writer, but once he hit college he found himself unexpectedly drawn to neuroscience because he was interested in asking big questions: What makes us human? What is our consciousness? How do we build meaning and value in our lives while knowing that we are physical bodies and we’re mortal? Paul’s interest in literature and neuroscience is what ultimately brought him into medicine where he could grapple face-to-face with real-life human stories and challenges.

I’ll give you one example that illustrates Paul’s deep love of literature. In 2013, we got the terrible chest x-ray result and saw that Paul’s chest was riddled with nodules. With both of us being physicians, and knowing he had been having unintentional weight loss and excruciating back pain, it became quite clear that it was metastatic cancer. (And you know you are having a bad day when you are hoping for disseminated TB and Pott’s disease because that would be better than the alternative.) So, we were packing for the hospital for further workups, and I was packing a suitcase full of comfy pillows and socks and computer chargers. Paul only packed three books: *Mere Christianity* by C.S. Lewis, *Being and Time* by Martin Heidegger, and *Cancer Ward* by Aleksandr Solzhenitsyn. That captures Paul literary and philosophical mind. As he stood on the brink between surgeon and patient, his immediate impulse was, I need books. I don’t think he had read a real novel as a neurosurgery senior resident, but now he reached for them immediately. And when he was ill and first returning to neurosurgical work, and then writing *When Breath Becomes Air*, he was always reading—everything from memoirs on mortality to poetry.

**CQ: Anyone who has read Paul’s book would know that he came from an incredible literary background. Tell us a little bit about why Paul chose neurosurgery of all the specialties ready to welcome him—why neuroscience, and why surgery?**

**LK:** It’s interesting that someone like Paul, who seemed to be seeking answers to bigger questions, ended up devoted to medicine and the even more specialized field of neurosurgery. He said some really beautiful things about neurosurgeons and his mentors, and the importance of the field. In his book he said that he wanted to join the ranks of the polymaths, meaning that neurosurgeons not only need to be superior surgeons but also need to be neuroscientists and humanitarians too. So I think he was really very proud to call himself a neurosurgeon, and that...
is where he pinned his highest hope. And I think he hoped his retirement would be filled with writing. After his diagnosis of metastatic lung cancer, he had to enter quickly into his retirement plans. When Janet Maslin in her New York Times review called Paul a polymath, I think that was the highest compliment because he had been seeking to become a medical, surgical polymath!

CQ: When I read Paul’s book, I knew immediately that he, somehow, understood me. But that may be obvious as he and I had very similar training. He taught me many of the things I know how to do today; he was my mentor, and we grew together. But what about the rest of the world? I know that many people who have read his book find a personal relationship with Paul—whether they are in medicine or not. Why do you think Paul was able to connect with people?

LK: I think there are a few big philosophical underpinnings that Paul tried to live his life by. One was, generally, the idea of love. He called this human relationality—our relationships and what we are doing to take care of each other interpersonally and collectively, to generate meaning through our relationships with one another. This was the basic thing we should be doing as humans. Similarly, he felt that the idea of striving was critical. That means in a basic sense that he wanted to strive to do the right thing, to be a good person, to get better at everything he was trying to do. I’m sharing this with you because this is some of what he wanted me to carry forward with our daughter.

In simple terms, Paul wanted our daughter to know that 1) she is loved and 2) that it’s important to try hard. I think that’s what a lot of us think about teaching our kids, and what we hope for ourselves too. These are the tenets and themes of his life. Paul would have obviously said them magnificently better than I am right now, but I think those ideas are something people can relate to. Those ideas are what help us define our values, and we struggle to live according to those values. And I think therein lies the communality of everybody. Finally, Paul felt that we are all guaranteed suffering. Suffering is a part of life and you certainly can’t—and shouldn’t—avoid it. He felt that life was about more than avoiding suffering; it’s about creating meaning.

I think the other thing is that people are curious and empathetic and drawn to art, and Paul is just telling a story about something that happened to him—facing mortality and finding meaning as a physician and a patient. It’s more than just literature; it’s a springboard for really important conversations.

CQ: Did the number of people that were able to relate to his writing surprise you personally? I highly doubt it surprised Paul, as I believe he always knew what he was doing and creating, but how about you and your family?

LK: I think the sheer size of the response has been overwhelming. I was reading the book as he was writing it, daily, or weekly. I was literally lying next to him as I was on maternity leave, and once he was really ill we were together all the time. There are certain things, like a paragraph he
writes as a love letter to our daughter Cady, or the title of the book *When Breath Becomes Air*, drawn from an ancient poem, certain things where, when you read them, they just strike you in a certain way; they bring a tear to your eye, or make you shiver, or you say, “Aha!” or you underline what he wrote. As his wife and knowing him well, I knew that he was a talented writer. Now I have gotten a ton of letters and feedback on his behalf. But yeah, for me, shocking and amazing.

**CQ:** We are very proud of Paul, and very proud of you. The two of you have touched so many lives around the world. What can you share with the next generation of neurosurgeons, as they endure rigorous training, fight to carve out personal time, and strive to be the best for their patients?

**LK:** You know, Anand, I’m tempted to turn around and quote you! Paul’s obituary included this reflection by you: “(Paul) has a way of identifying your strengths and weaknesses to elevate your skills in unison. Gifted. As surgeons, we often become so entrenched in treating the disease that we forget who it is we are treating. I remember when Paul returned to the neurosurgical service and started operating again back in late 2013 (after he was diagnosed with stage IV lung cancer). At that time, I was Paul’s shadow, learning and supporting however possible. We walked out of the operating room corridor together, toward the intensive care unit, and I was complaining of being tired and worn out—and he looked at me and said, in this very satirical voice, ‘You know I have lung cancer, right?’ I looked at him with great surprise, as if such things shouldn’t be said out loud, and I’ll never forget what he said to me next. ‘Don’t forget what you do, and who you do it for. These are people who you can help, and you shouldn’t forget that.’”

At the same time, please remember to go home and kiss your spouse! It’s a tough balance. My hat’s off to you. Thank you for sharing Paul’s work with the neurosurgical community and for supporting our family.

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**Caelica 83:** You that seek what life is in death

*Baron Brooke Fulk Greville*

You that seek what life is in death,
Now find it air that once was breath.
New names unknown, old names gone:
Till time end bodies, but souls none.
Reader! then make time, while you be,
But steps to your eternity.

To read more about Paul Kalanithi’s life, visit paulkalinithi.com.

“I FELT THAT LITERATURE PROVIDED THE BEST ACCOUNT OF THE MIND, AND NEUROSCIENCE LAID DOWN THE MOST ELEGANT RULES OF THE BRAIN.”

—PAUL KALANITHI
In 2008, neurosurgeon Eben Alexander, MD, woke up in excruciating pain. Within hours, he was in full grand mal seizure and was rushed to the hospital. The diagnosis was a rare and usually fatal form of E. coli bacterial meningitis, and his prognosis was grim. For seven days he lay in a deep coma. Despite the overwhelming odds against his survival, he not only woke up, but recovered completely.

Dr. Alexander awoke with new insights, having experienced an astonishing and spectacular journey to realms beyond our known physical universe. He was so changed that he felt compelled to write the book *Proof of Heaven* (2012), which recounted his experience in coma. His honest struggle to make sense of this unforgettable journey is a gripping story. Dr. Alexander explains that the profound lessons he learned from his NDE (Near-Death Experience) were a complete revision of everything he had come to believe about science, consciousness, spirituality, and the very nature of all existence.

*Proof of Heaven* was a No. 1 New York Times Bestseller.
Times bestseller for over 40 weeks, and remained on bestseller lists for over 97 weeks. It has been published in over 40 other countries and dozens of languages. In 2014 Dr. Alexander wrote *The Map of Heaven*, which delves deeper into science and consciousness. Dr. Alexander resides in Charlottesville, Virginia, with his life partner, Karen Newell, and they are currently working on a third book.

**Congress Quarterly**: What were your goals in writing this book, and what do you hope to convey to the public?

**Dr. Eben Alexander**: It’s important to stress that when I first came out of the coma, my brain was devastated. My mind took about eight weeks or so to recover, and as I slowly came back, the memory of what had happened deep in coma remained strong. I believed what my doctors told me initially, which is that my neocortex had been too damaged from this global, seven-day meningitis to have experienced anything other than the meagerest of experiences. I knew I did experience something profound, and that’s why I wanted to write the whole thing down. The initial effort was just to try to understand it for myself personally. Then, months after that, I came to realize that there were tremendous implications about the neuroscientific understanding of conscious awareness as it relates to the neocortex, because basically my meningitis was an experimental prep that did a very good job of damaging my neocortex. Initially, the manuscript was going to be a paper for the neuroscientific literature questioning the neocortex and our views of consciousness. Over time I came to realize that mine was a much bigger message. I wrote the initial manuscript to help the open-minded scientific skeptic, as I viewed myself before the coma, advance to the next level in an understanding of consciousness.

**CQ**: How do your neurosurgical colleagues respond to you now in the context of your new belief?

**EA**: A lot of them have been very supportive and have gotten right on board in agreeing this is a very deep mystery and opens your eyes to the scientific proof of non-local consciousness, that is, consciousness independent of the brain. Of course I don’t know if some neurosurgical colleagues out there think I’m a nut and that I completely lost my marbles after my coma experience, but I can say that the ones who do communicate with me are fascinated, and several of them were very important in helping me to arrive at my understanding of all this over time. Dr. Michael Schulder has been very helpful in an early version of my story published in the AANS Neurosurgeon. Also, Dr. Allan Hamilton, a good friend of mine who is a neurosurgeon in Tucson, Arizona, was helpful in my early endeavors, and other neurosurgeons have been helpful in the sharing of my story. Dr. Jim Rutka was kind enough to invite me to deliver the Kergin Lecture at the University of Toronto in February 2014, and it was an honor to be given that opportunity. I would love the opportunity to present my notions of consciousness at some of the major neurosurgical meetings in the world and get feedback. I’d like to open up a discussion forum in the wider neurosurgical community.

**CQ**: What concrete things convinced you this was real versus a dream?

**EA**: In those first weeks and months of recovery I simply assumed my experience had to be some kind of fantastic, wild hallucination. But trying to explain it as a hallucination was how I began running into deeper and deeper problems. This difficulty of the physicalist position in explaining my experience is covered in the nine hypotheses listed in Appendix B in *Proof of Heaven*. I could not come to an easy explanation, given the damage evident in my neocortex (through my neurological exams, scans, and laboratory values). The neurologic exam during my clinical course, plus the CT and the MRI scans revealed that it was a global phenomenon. None of the eight lobes of my brain were spared from the onslaught of the disease. That fact is what ended up being something of an ally in my trying to understand the nature of it, because if a large section—or any section—of my neocortex had remained unscathed, then I would not have been in any position to comment on the role of the neocortex, or lack thereof, through all of this. I went from symptom onset to coma to status epilepticus in about three and a half hours, and that in itself is a very bad indicator. The rapid descent into coma is what gave me about a ten percent chance of survival at the beginning of the week. As the week progressed, my clinical situation deteriorated, and the estimated survival probability dropped to about two percent. That’s the point (morning of coma day seven) when the doctors had a conference with my family and said the best case scenario was that I would be transferred to a nursing home in a persistent vegetative state and die a few months later. They suggested that the best option might be to stop the antibiotics and “let nature take its course.” And it was a few hours later that I started coming back to this world. And then began the incredible and miraculous recovery that really has no Western medical explanation at all.

**CQ**: Briefly, can you explain a little bit about your experience in coma?

**EA**: The key feature is the notion of ultra-reality, which is a little difficult to explain to people. What happens in an NDE is that we actually get to the other side of that veiling function of the neocortex. And that realm of consciousness is flowing in a much more universal and infinite way. Because I oscillated to the higher and higher spiritual realms, all the way to what I call the Gateway Valley and up to the Core (Infinite Oneness), but then would tumble back to the very primitive unresponsive realm (the “earthworm’s eye view”), I came to realize that I initially thought that lower, primitive view was the best form of consciousness that my physical
brain could muster while it was soaking in pus. And it was so astonishing to have a clear white light come towards me with the perfect, musical melody slowly rotating and serving as a portal up into that gateway realm. It was ultra-real, filled with lush and alive forms, very ideal like Plato’s “world of forms,” and one that is personalized—where our higher soul re-unites with our soul at the time of death. We can also do this via conscious meditation or centering prayer or similar means that transcend the veil. But it was really a matter of getting in touch with that pure consciousness—and that’s the nature of that ultra-reality.

CQ: In your summary of neuroscientific hypotheses to explain the phenomena of what happened, you talk about REM intrusion and DMT dump theories—referring to neurotransmitters or drugs bringing on a hallucinogenic experience. Both possibilities require a functional neocortex, which you describe was not present in your case. How do you know your cortex was off when you had this experience? Continuous EEG?

How do you account for the timing of your experience?

EA: The issue we ran into was the extent of damage to my neocortex, given my neurologic exams even in the emergency room. My highest Glasgow Coma Scale was 8 in the ER, but it went as low as 3 during much of the week. One of the hypotheses I mentioned was related to the six-layered anatomy of the neocortex, trying to explain the ultra-reality as some kind of a relative sparing of the excitatory and destruction of the inhibitory networks, but that really doesn’t fit the cortical anatomy. Many people ask for my EEG results, although, in fact, that is not a very high bar in terms of suggesting brain damage—the EEG routinely goes flat-line (isoelectric) within 20 seconds of cardiac arrest, and my cortex was assuredly more damaged than in that scenario, so I doubt the EEG would have been very valuable. In fact, my doctors had given up hope while I was in coma because of the dire presentation (diminished cortical and brainstem reflexes, CSF: 4,260 WBCs, protein 1,340 mg/dl, glucose 1 mg/dl, etc.), and thus did not perform an EEG. My oculo-cardiac reflex was gone; any evidence of residual functional neocortex was gone. Even my brainstem was badly damaged from day one (abnormal oculomotor function). They gave me a very dire prognosis.

Even today, my doctors have no explanation for my complete recovery given the severity of my meningo-encephalitis. The other point I would make about the timing of the experience, in response to the notion that maybe all of this was some kind of random dump of information either going into coma or coming out of the coma, is that invariably there were some time anchors in my coma—for example, those six faces that appeared to me at the very end of my journey. They suggested the vast majority of the coma journey, which seemed to go for months although it had to fit within seven earth days, actually happened between days one and five of my coma.

CQ: Were you religious before your NDE?

EA: My father, Eben Alexander Jr., was a tremendous influence in my life, and he was very religious. He was also the head of a neurosurgical training program and highly scientific. For him, there was never any conflict between science and religion. For me there was. I grew up in the 60s and 70s, and while I wanted to believe everything I was taught in the Methodist church my Dad took me to every Sunday, over the years—and in my years in academic neurosurgery—I found it more and more difficult to have any kind of understanding how conscious awareness could survive death of the brain and body. And I fell into the party line of our conventional neuroscience that the “brain creates consciousness.” And of course my coma journey changed all of that. I now have a very profound belief in the reality of God. I believe God is the very core of our consciousness. This is where I see the synthesis of science and spirituality leading to a much more profound understanding of the nature of God and the spiritual workings of this universe.

CQ: What do you think happens to patients who remain in persistent vegetative state?

EA: That’s a fascinating question. In the last few years there have been some isolated reports of EEG findings and other subtle findings of activity in the brain, especially in people with persistent vegetative states that suggest there may be a lot more going on in their awareness than we recognize. There are occasional reports of people who come back from persistent vegetative states. I’m not sure when the soul might be leaving the body, but I think there are probably patients out there in a persistent vegetative state whose souls might have already moved on. I will say that, when I talk to medical audiences, I may stress that I don’t care if your patient is in coma, has been pronounced brain dead or physically dead, I always encourage the
family to assume that anything they say around the patient can be heard, that some aspect of the soul is there and is paying attention. We certainly don’t know otherwise. I must say, parenthetically, that I’m still a very strong supporter of brain death criteria. I’m an organ donor. When patients and their families contact me, I tell them that I strongly support brain death criteria and that those recommendations should be followed concerning withdrawal of care.

**CQ:** How did the experience change you as a person? How do friends and family think you changed?

**EA:** I would say that it has changed me from the ground up. Within the first few months after coma, especially when my prior memories were coming back, I really had to go back to square one. Everything I had put together in my world view about the nature of reality was very much in question, and much of it was completely wrong. It has also involved a complete shift in how I view humanity. All aspects of the universe that we think are part of the physical universe are part of the much grander realm of the infinite consciousness. We are part of that infinite consciousness, and we can be in touch with that one universal and infinite mind through deep meditation and centering prayer. I often say in my talks, you don’t have to die or almost die to come to know everything I know about those realms.

As conscious beings we can cultivate our connection through meditation. The answers lie within us all. I talk about this subject especially in the appendix to *The Map of Heaven.* Meditation helps turn off that little voice in your head. For neurosurgeons, meditation offers a tremendous value. Neurosurgery is such a demanding craft—it demands the best we can muster, and I have found that my own capabilities in terms of physical, mental, and intuitive healing are much better because of ongoing meditation. I highly recommend it to others in the neurosurgical community.

**CQ:** How does your experience affect your practice of neurosurgery or how you feel about the field of neurosurgery?

**EA:** I went into neurosurgery mainly to follow in my father’s footsteps. He was such a mentor to me, and in many ways, he was a saint. I’ve never regretted that decision. I think neurosurgery is by far the most fascinating field in medicine. It’s a beautiful field, and I love the comradery and the fellowship that I’ve enjoyed with fellow neurosurgeons. When I fell ill I was working as the director for brain research in the Focused Ultrasound Foundation in Charlottesville, and I was coordinating research in focused ultrasound surgery. I went back to work within three months of my coma, which I believe was a real shock to my boss, Neal Kassell. I also began seeing patients part-time with my former neurosurgery partners, but things got too busy, and I couldn’t give my patients the time that was due to them. I finally let go of my clinical practice around June of 2012, and by that time I was coming to realize that I really was on my life’s mission. Now, whenever I talk to medical students and residents, I encourage them that they have made the right choice. Neurosurgery is the most fantastic field going on in modern medicine (from my personal point of view).

**CQ:** What are your feelings about fear of death now?

**EA:** There is nothing to fear about death, as death is really an adventure where our consciousness and awareness are liberated from the shackles of our physical brain into a much higher level of realization. Of course this is what those who have undergone near-death experiences, mystics, and journeyers have been telling us for thousands of years.

One consequence of all of this effort is that we will come to see, as a culture, that death is not the end and that our souls are truly eternal. And hopefully we will come to a much deeper understanding of the relationship between brain and mind. To realize that death is not the end is to know that we are far more than just our physical bodies, limited just to the minuscule birth-to-death and nothing more.

To read the full interview with Dr. Alexander, visit cns.org/cnsq.
Katrina Firlik, MD, is a neurosurgeon turned writer turned entrepreneur. Her witty and insightful memoir, Another Day in the Frontal Lobe: A Brain Surgeon Exposes Life on the Inside (2006), offers an engaging look into the profession. She enjoys conveying medical concepts to the public and has appeared on CNN, Fox, and MSNBC as a commentator on a variety of medical issues. She is also co-inventor of a brain stimulation device designed to enhance recovery after stroke. Dr. Firlik is co-founder and chief medical officer of HealthPrize Technologies, an Internet company with a novel solution for improving adherence to prescription medications. Previously, Katrina was a neurosurgeon in private practice at Greenwich Hospital in Greenwich, Connecticut, and on the clinical faculty at Yale University School of Medicine. She lives in Darien, Connecticut, with her husband, Andrew, a neurosurgeon-turned-venture capitalist, and their daughter, Annika.

**Congress Quarterly:** As a neurosurgeon, how did you get interested in writing?

**Dr. Katrina Firlik:** My interest started a lot earlier, when I was back in college really. That’s when I started reading a lot of well-known physician writers—Oliver Sacks, primarily, and also Richard Selzer, who was a surgeon. Their writing helped me become interested in medicine, and specifically in the brain, as a college student. My interest in physician writers continued as I went on through residency and beyond.

But in terms of why I decided to write as a neurosurgeon, I realized that I had this privileged view of so many things that other people outside of neurosurgery would never have access to. I love explaining things as well, so it was a fun challenge to describe some of the experiences I had about the process of becoming a neurosurgeon. Also, crafting the perfect sentence and finding the right word to describe something is enjoyable for me, it doesn’t feel like work. It is very satisfying for me to write.

**CQ:** Did you take notes during residency?

**KF:** I did take notes. During my residency, I wasn’t planning to write a book. But I did have the foresight to realize that I was going to see a bunch of amazing things, and I decided that I was going to very loosely keep a journal. When I heard interesting conversations between residents and attendings or heard a touching quote from a patient, I wrote it down on a 3 x 5 index card and put it in the pocket of my white coat. It was a little messy because as you know residency is very challenging and there was very little time. But as the quotes collected in my white coat, I would transcribe them into my laptop about once a month. By the end of the seven years, I had a pretty good volume of interesting things I had collected that I would not have otherwise remembered in so much detail.

**CQ:** What was your writing process?

**KF:** I started by writing an essay. It was a childhood dream of mine to publish in the New Yorker, although I realized later this is nearly impossible to do. But I wrote an essay, regardless, and sent it around to some of my friends for their opinions. One of my friends who is a writer sent it to his agent without telling me. His agent immediately loved it and called me, suggesting that I write a book. She walked me through writing a proposal and interviewing at publishing houses. It was a fun, exciting experience to get to know the publishing world. Over two days we literally walked from publishing house to publishing house in New York City, pitching the book to editors. It was so different from my clinical world. Then one chapter at a time, I sent my writing to my editor at Random House. The editor would look at each chapter and make recommendations about how to change it. She gave me a lot of leeway and latitude, with broad scale suggestions, often about adding personal anecdotes here and there.
CQ: What would you say is your most interesting writing quirk?
KF: I don’t know if I have any bizarre quirks. But I love reading about the quirks of other authors. For example I read once that Michael Crichton ate the same lunch every day for months as he was working on a book. I suppose I have to have everything organized before I can sit down to write. I’m kind of a neat freak, and if things are disorganized or if there is a pile of laundry, I have to tidy up before I can think.

CQ: What was one of the most surprising things you learned in creating your book?
KF: I always assumed that the author would have some say in the cover. And they don’t. I learned this when I went to my editor at Random House with recommendations for the cover, and she said gently that I should stick to the writing and they would take care of the marketing. The one thing I didn’t want was for me to be on the cover. I knew this would really embarrass me in front of my colleagues. Well, it turns out Random House wanted me to be on the front cover. I was much happier with the cover of the Chinese version of my book. It features a cartoon head with a wrench next to it.

CQ: Has this book impacted your neurosurgery practice or career goals?
KF: One thing that may not be obvious is that I’m currently not practicing. I practiced for several years and loved it, although what it made me realize about myself is that I also have a part-time neurosurgeon! So I went through a long transition period and ended up starting a healthcare Internet company that hopefully, if successful, will allow me to help a lot of people. But it did, unfortunately, require that I give up my practice. So currently, I’m co-founder and chief medical officer of a company called HealthPrize. It’s very exciting. The reason that I loved residency so much is because it is such a steep learning curve; you are constantly learning new things every day. And that was very similar to the challenge of starting a new company.

CQ: Do you have any suggestions for other surgeons interested in writing?
KF: First, I think that any doctor has enough stories to write a book. The question is whether they want to go through the work of writing the book. Medicine is just perfect for stories. If they have an interest, I suggest taking notes along the way. I never could have written a book had I not taken notes during residency. Those notes were incredibly helpful when I sat down to write years later. Second, I would suggest reading a lot. Even if there isn’t time to read novels, reading essays and short stories will help inspire good writing. And third, I would caution that when we sit down to write for the general public, we almost have to unlearn what we learned for writing in academic publications. The style that is used for academic writing is often dry with convoluted jargon. Great writers often write fairly simply. Try to write so that you are understood.

CQ: Do you think you will write another book?
KF: At the moment, I am finishing a proposal for my second book. Time slipped by after I published the first one, and I had to keep pushing back my second book. So now I’m working on it, which is not a memoir but is broadly about life-saving techniques. So it is medical and it is timely, with so many people worried about being at the scene of trauma. If anyone has stories they want to share with me on the topic, I would love to hear them.

CQ: What do you think makes a good story?
KF: Definitely some form of tension. One reason that neurosurgery was so perfect for a book was because there are often ethical quandaries with patients in dire scenarios, and there’s often differences of opinions between large personalities about who to take to surgery. And some kind of human angle that people can relate to is important. That’s why I loved borrowing from conversations I overheard. Something that I learned from my editor was that readers like to get to know the writer in nonfiction writing, so personal anecdotes really help.
Brian T. Andrews, MD, is chairman of the department of neuroscience at California Pacific Medical Center (CPMD) and an author of both fiction and non-fiction works. He authored Knife Under Fire (1993), a fictional murder mystery/thriller focusing on a neurosurgeon practicing in San Francisco, followed by The California Mille (1997), chronicling the same character as he navigates the famous west coast classic car race. His most recent book, Cherokee Neurosurgeon (2011), is a biography of his chairman and mentor at UCSF, the neurosurgical giant Charles B. Wilson. Born in British Columbia and raised in San Francisco, Dr. Andrews completed his medical school and neurosurgical training at the University of California San Francisco. I had the unique opportunity to interview Dr. Andrews through a series of phone interviews in which we discussed his personal life, academic interests in neurosurgery, and his literary works.

Congress Quarterly: Could you please tell us a little bit about your neurosurgical practice?
Dr. Brian T. Andrews: My initial practice was focused on neurotrauma. I was very interested in that as a senior and chief resident at SF General. After I finished my training I stayed on and did clinic, covered call, and neurotrauma. At the same time, I also built my private practice at Pacific Presbyterian (now CPMC) in San Francisco. I was not wedded to staying in academics for a few reasons: first, I didn’t like bench science, I liked clinical research and clinical work, and second, I had a fatal flaw—I didn’t like constantly mentoring residents in the operating room. I was not a fan of standing by while residents did the surgery. I was technically adept and able to do cases quickly and well, and was much happier doing cases myself.

I also did something I highly recommend to residents—I got involved in the Joint Section on Neurotrauma and Critical Care. In fact, in 1996 after moving through leadership I became joint section chair, which lasted a year. The whole experience was enjoyable and kept me wired into the CNS and AANS and their executive committees. It also helped me foster relationships with publishers like Thieme because they were the ones that published the later books. I had a big interest in continuing my writing. I wrote a number of textbooks, mostly edited, and through my joint section contacts I could bring in some of the best people to write chapters on critical care. That was a lot of fun. My academic interests now are really focused on our program development with stroke and ancillary research on the stroke service.

CQ: Were you always a writer?
BA: I became interested in writing during college; I was a bio major at USC but was very interested in fiction writing at that time—Hemingway, Steinbeck, that sort of thing—and I was always a big-time reader of fiction. I did a number of creative writing classes but did not focus on it in any major way. When I went on to neurosurgical training I focused on academic writing. There was an editorial office where each resident was connected with an editor, and I had a young editor to work on my technical writing skills. That was extremely useful. Once I finished my residency I had a number of published works. I was really interested in neuro-intensive care so I embarked on writing a textbook titled Neuro-intensive Care, which was published in the early 1990s and was fairly popular around the country. So I wasn’t always a fiction writer, but I carried on with academic writing using the lessons I had learned through the editorial office at UCSF.

CQ: Let’s talk about your first novel, Knife Under Fire. What made you decide to take the leap from academic writing to fiction—and a mystery/thriller at that?
BA: As a young neurosurgeon I loved the books by Tom Clancy. Here is a guy who was an insurance broker from Maryland who got very interested in the CIA and nuclear submarine warfare and started writing books. I was very impressed that an insurance broker could become so facile at describing a technical field in a way that made it fascinating for the reader. That led me to thinking that maybe...
as a neurosurgeon I could take the technical parts of neurosurgery and do the same thing. I wrote Knife Under Fire, which came out in 1993 through a small publishing company in San Francisco.

I didn’t really take any formal training on fiction writing. I just tried to engage the reader by describing what it’s like to do a craniotomy. In fact, the very first chapter opens with the character’s day, starting before dawn, then clipping an aneurysm which ruptures during the case—you can’t get more dramatic than that very real type of event. The reviews were mixed, but I enjoyed writing it, and the patients enjoyed reading it, too. I think they liked having a window through which to see me and experience my field.

CQ: So you decided to continue the story line with the same character in your second book, California Mille?

BA: The second book basically took the same main character and places him in this famous vintage car rally, a real event that occurs every year. My father and I are enthusiastic about the Mille and rebuilt a 1954 Jaguar specifically for this event, which we participated in many times in the 1990s. I placed my character in the Jaguar and wove a mystery around his experience. And again I tried to include what it’s like to be a physician in the setting of this exclusive trip. It was tense and a bit light-hearted, and I really enjoyed writing it. Both my friends in the vintage car hobby and my patients seemed to enjoy it.

CQ: Was it difficult to transition from academic to fictional writing?

BA: I didn’t really think the transition to fiction writing was all that difficult after all the editorial advice I’d gotten in my science writing. I think that non-fiction and fictional writing are not difficult—but they require perseverance. My style was to get up early when I was in the middle of a project. I’d always be thinking about it throughout the day and get up early the next morning around 4:30 or 5:00 a.m. before OR or the clinical day to get the writing done when I was really fresh.

CQ: Next you wrote Cherokee Neurosurgeon, the biography of Charlie Wilson. Why did you decide to write a biography after two works of fiction?

BA: I was sitting in the front row when Charlie received the Cushing Medal in 2008. I was a former resident of his and began thinking that it would be fascinating to put together his life story, because he was such an interesting individual. Charlie was a guy who was absolutely devoted to his clinical practice, clinical neurosurgery, and developing brain tumor research, but he was extremely flawed when it came to conventional life. There were a couple of books I read about doing biographies, and I used a basic linear format for writing this work. I began by developing a series of questions, starting with Charlie’s childhood and his upbringing. His dad died when he was very young, and his mom was very influential—she is the Cherokee side of him (he is one quarter Cherokee). I ended up with about 15-20 interviews with him, which I transcribed long hand. Then I started to bring in other people, progressing through his life. I spent a lot of time on the phone doing these ancillary conversations and taking longhand notes. I used many of the stories and anecdotes from the people from his life and career and wove them into the story. Writing this biography was a way to bond with my mentor, and to this day we are extremely close. And it turns out that writing Charlie’s biography has become one of my favorite things I have ever done.

CQ: What advice do you have for young neurosurgeons?

BA: I think my advice to young neurosurgeons is that you often will get—coming out of Stanford/UCSF academic programs—biased opinions that academic neurosurgery is the only game in town. And that is simply not true. There are absolutely fulfilling wonderful practices in this terrific career that are outside of teaching institutions, and there are lots of examples that terrific work can happen in other places and even smaller communities. Neurosurgery is so fulfilling because you have patients with true needs and you can be life changing in any practice setting.

CQ: What’s next as you look forward? Will you continue to practice? Will you write more books?

BA: I just turned 60, and I plan to work another decade. I think that neurosurgery will be hard to leave, but I’m honing it to do what I do really well at a volume that I like. And my writing practice will continue. I’ve got a couple of fictional things to work on and possibly another biography. I don’t think I’ll do any more academic writing, but to return to other types of writing will be really fun. I think that it’s something that will take over my interest and energies.
Internet-based social media networks have changed the world. For physicians, social media can serve as a powerful resource for education, communication, and branding. How can neurosurgeons best put social media to work on behalf of our patients and our profession?

Twitter is one of the best-established social media networks today, boasting over 300 million monthly active users worldwide. Basic Twitter use is easy: posting 140-character or shorter messages, accompanied by photos or small video files if desired. Signing up using a smart phone or laptop computer takes less than five minutes and is free. One connects to other users by tweeting messages, news items, web links, and hashtags (#) identifying trending topics.

In 2012, colleagues asked me to join a small cadre of physician social media representatives of Doernbecher Children’s Hospital at Oregon Health & Science University, where I practice neurosurgery. Hospital public relations staff support our group of eight or so physician volunteers and post our periodic blog entries on a university-organized website.

The university also asked us to open and use Twitter accounts. Other than conforming to the university’s “fundamental standard” for employee communication, they imposed no restrictions on our Twitter feeds and gave little specific advice.

From the start, I have mixed tweets about hospital events and announcements with more personal notations. For example, when a surgeon in my division or department publishes an interesting new paper, I share the e-pub link on Twitter. At the same time, when I have a great experience at a sports or arts event in my community, I share that. When I find a quote or piece of Twitter wisdom that makes an impression on me, I “retweet.” If I capture a beautiful image of a sunrise out the hospital corridor window, that goes out too, as do the latest antics of my beloved golden retriever, Angus.

Why does this matter? More specifically, who is watching? One of my first followers was a retired neurosurgeon and strong friend and philanthropic supporter of our program. When he learned I was on Twitter, this octogenarian opened an account and chose only two feeds to follow: one belonging to his daughter, and mine. When one of my activities or a notable success by our division came across his home computer on Twitter, he often sent me a congratulatory card or email. Using Twitter, he was able to closely follow the results of his philanthropy and play a more engaged and continuous role in our work.

I am also followed by (and follow) a grateful patient who survived a life-threatening motor vehicle crash and now makes hand-crafted blankets for kids at Doernbecher each year. Many other community members also follow, and connect us to local political groups, the media, and other organizations.

Through Twitter, colleagues at OHSU and across the country keep abreast of our academic and programmatic activities, and not infrequently reach out in the “real world” to interact. In one example, Dr. Atul Grover, the national policy director for the American Association of Medical Colleges, and I exchanged extensive information and links through Twitter. Eventually, I invited Dr. Grover to speak at the 2015 CNS Annual Meeting, where he addressed thousands of neurosurgeons about U.S. medical and surgical manpower needs, and also met and collaborated with our national advocacy leadership. When I had the honor to serve as CNS President in 2015, my Twitter community expanded greatly to welcome neurosurgical colleagues from around the U.S. and the world, and the subject of my tweets expanded to include celebrating the hard work of CNS committees and leadership on behalf of our members.

Finally, personal posts of a sunrise view or a puppy’s antics also humanize and connect me with patients, professionals, supporters, and philanthropists who tune in on Twitter, deepening connections and helping to build community.

Dr. Nathan R. Selden, MD, PhD, is past-president of the Congress of Neurological Surgeons.

Dr. Jordan Amadio, MD, MBA, is a PGY-6 resident at Emory University and a social media ambassador for the Congress of Neurological Surgeons.
Much like neurosurgical training, Twitter emphasizes brevity and efficiency of communication. A quick daily scroll through my newsfeed allows me to stay abreast of news, research findings, and the opinions of thought leaders. This can be done on the way to rounds, in the hospital elevators, or in between cases. It is an effective method for making use of interstitial time, those minutes of the day that might otherwise go to waste.

The neurosurgery community is well represented on Twitter. My newsfeed includes public figures such as @drsanjaygupta and @RealBenCarson. It includes professional societies such as @CNS_Update, @AANSNeuro, and @youngneuros. I have come to enjoy updates on emerging research publications from peer-reviewed journals such as @NeurosurgeryCNS and @thejns, as well as from online blogs such as @neurosurgery and @neurocirurgiabr. Most importantly, perhaps, I use Twitter to interact with dozens of neurosurgery friends, peers, and mentors around the globe.

A beautiful aspect of social media is that it democratizes the sharing of information. Every user is free to serve as their own publisher, sharing their thoughts with the world—whether in the form of text, multimedia, or simply the act of retweeting an item of interest. Some believe that medical specialists have a responsibility not simply to practice, but also to share their voice of knowledge with society. Although not every neurosurgeon will choose to accept that mission in the same way, for those of us who do, Twitter can be a convenient tool. A well-curated presence on social media can help educate oneself and one’s colleagues, lead to more engaged patients, and make thoughtful connections between seemingly disparate ideas. In a recent Wall Street Journal op-ed, Dr. Jeffrey Flier, dean of Harvard Medical School, wrote that he tweets because “it makes every day an adventure.”

As a neurosurgery resident, I have used Twitter to record my reflections on surgical training, technological innovation, and medical ethics. Writers have long recognized the therapeutic value of keeping a diary, and social media fulfills this role. Crucially, it has also facilitated countless rewarding interactions with clever and interesting people, many of whom are not neurosurgeons. It is hard to overstate the value of this interdisciplinary learning. At the same time, I have been able to gain a heightened perspective on my own daily work by seeing the viewpoints of other neurosurgeons and neurosurgeons-in-training, including those living thousands of miles away. Since 2013, I have served as a Social Media Ambassador for the Congress of Neurological Surgeons. In this role, I have worked with other neurosurgeons who are active on social media to promote live-tweeting at the CNS Annual Meetings through the sharing of key educational content and personal observations. From 2012 to 2014, I produced a Journal Club podcast for the Neurosurgery journal that used social media to disseminate interviews with leading neurosurgical researchers. It has been an honor to contribute to our professional community in these ways.

Of course, there are pitfalls to be avoided. When launching an online social media presence, every neurosurgeon must face one key decision: Will your account be professionally oriented only, or will you mix personal and professional content? Professionally oriented accounts are common for organizations, for individuals who are most concerned with marketing their practice, or for those who prefer to keep a separate personal account for friends. Posts tend to be factual and adhere to a narrow range of topics. Mixing professional and personal content often makes for a more engaging online presence, but neurosurgeons should be cautioned to follow the same (or greater) standards of professionalism online as we would offline. This includes avoiding any semblance of violating patient privacy or engaging in unprofessional behavior. Once a controversial post is viewable online, it may be difficult to fully eradicate. Neurosurgeons-in-training ought to be particularly cautious in how they are representing their institutions and should adhere to the ACGME core competency on professionalism. Above all, being an effective social media user requires sound judgment.

Ultimately, leadership in medicine requires the highest standards of vision and communication. When used properly by neurosurgeons, Twitter can serve as one useful tool for advancing public awareness, advocacy, community building, and education.

Please join us in the Twitterverse! Follow us @nateselden and @AmadioMD

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SECTION NEWS

Advancing Education and Opportunities in Neurosurgical Pain Care

The Joint Section on Pain works diligently to advance research and education in neurosurgical pain care. In previous years, didactics have focused on the management of neuropathic pain, trigeminal neuralgia, and lumbar pain. Recent initiatives, led by Drs. Julie Pilitsis and Steven Falowski, have included a new hands-on course for neurosurgeons who wish to incorporate pain procedures such as spinal cord stimulation and intrathecal infusion in their practice. In 2016 and 2017 we will further these efforts with major initiatives aimed at advancing education in pain management, especially in the area of ablative procedures for cancer pain.

Ablative central nervous system procedures were once commonly performed by neurosurgeons for the management of chronic pain, in particular cancer pain. The advent and popularization of neuromodulation technology has led to a revolution in the field of pain medicine, with significant advantages to patient care given the reversibility and adjustability of neurostimulation. However, neuromodulation is not effective for all patients and is not cost-effective in many patients suffering with terminal cancer. Some chronic pain conditions, in particular chronic cancer pain and select deafferentation syndromes such as brachial plexus avulsion, can benefit significantly from CNS lesioning procedures such as cordotomy and dorsal root entry zone (DREZ) ablation. Unfortunately, while these procedures continue to be performed by some experts, fewer neurosurgeons are experienced with CNS ablation today than in the past, partially due to the predominance of neurostimulation as the tool of choice. The reduced access to neurosurgeons experienced in ablative procedures is a significant concern and can negatively impact the quality of pain care nationwide.

While there are risks associated with surgical interventions, neurosurgeons can provide significant improvements in quality of life without the side effects of high-dose systemic opioids, and they should play an integral role in the care of patients with chronic cancer pain. In an effort to regain our role in cancer pain care and advance our opportunities for training on ablative procedures, the Joint Section on Pain will offer new didactic and hands-on courses for practicing neurosurgeons, fellows, and residents in the coming years. Further, we are working with colleagues in oncology and palliative care medicine to improve the interdisciplinary collaboration in cancer pain care.

The Joint Section on Pain is also acutely aware of the need to develop opportunities for neurosurgery residents and recent graduates to acquire knowledge and advanced experience in chronic pain care. While training in pain management is a requirement of every program, we recognize that further training is often necessary, particularly for those who wish to make pain management a significant portion of their practices.

To honor John C. Oakley, a great educator, pioneer, and advocate for the role of neurosurgeons in pain medicine, we are pleased to announce a new fellowship to fund neurosurgery pain education. The 2016 Oakley Fellowship funds a two- to three-month traveling experience to a center of excellence in pain care. Eligible applicants are residents PGY-4 or later, and neurosurgeons within two years of finishing residency.

Candidates should submit a 500-word proposal summarizing their goals and identifying the mentor and institution where the training will take place, an up-to-date CV, their mentor’s CV, and a letter of support from their chairman or program director. Help is available in identifying potential mentors and sites. Please submit applications to Andre Machado, Chair, Joint Section on Pain, at machada@ccf.org. Applications are due by August 1, and the successful applicant will be notified by October 15, 2016.

Finally, we invite all colleagues who include pain care as a significant part of their practice, as well as those who would like to develop an interest in pain management, to join our section. For a membership application, please apply via the MyAANS website or email Karen Yoshikawa directly at kny@aans.org. Medical students, residents, and fellows are encouraged to apply. We invite you to attend and participate in our biannual meeting in 2017 as well as our sessions at the 2016 CNS Annual Meeting, September 24–28, in San Diego, California.
The 44th Annual Meeting of the Joint Section on Pediatric Neurological Surgery was held December 8–11, 2015, in Seattle, Washington. Hosted by Drs. Sam Browd and Amy Lee, the theme was *Innovation, Invention and the Future of Pediatric Neurosurgery*. We are pleased to announce the meeting had a record attendance of nearly 400 people. A total of 67 oral presentations, 20 top posters, and 46 e-posters were presented.

The Raimondi Lecture was given by Rick R. Holley, chief executive officer of Plum Creek, a premier land and timber company dedicated to responsible environmental stewardship, community engagement, and innovation.

The AAP/SONS Lecture was delivered by Wendy Sue Swanson, MD, MBE, a pediatrician and executive director of digital health at Seattle Children’s Hospital. She is also the author of the excellent *Seattle Mama Doc Blog*. Dr. Swanson works to revolutionize health communications by using social and digital media to bridge the gap between parents and doctors.

The prestigious Ingraham Award was given to A. Leland Albright, MD, for his outstanding contributions to our field. Dr. Albright’s work throughout his career in the United States and Africa is a tribute to our profession, and the Ingraham Award was a well-deserved honor.

Three outstanding clinical symposia were presented: Hydrocephalus: Shunting vs ETV (Drs. Kulkarni, Riva-Cambrin, and Klimo); Concussions: Controversies in Management (Drs. Johnston, Duhaime, and Ellenbogen); and Advances in Tumor Technology (Drs. Ellenbogen, Olson, and Holland). We invite you to join us next year at the 45th Annual Meeting of the Joint Section on Pediatric Neurological Surgery, taking place in Orlando, Florida, December 5-8, 2016.

Looking ahead, the Matson Lecture will be given by Cesar V. Borlongan, PhD, at the AANS Annual Meeting this May. Dr. Borlongan is distinguished professor and vice-chairman of research at the University of South Florida Department of Neurosurgery and Brain Repair, and Director of the Center of Excellence for Aging and Brain Repair. He is a world leader in stem cell research for stroke therapy. His highly innovative translational bench to clinic research has led to five FDA-approved clinical trials of cell transplantation in stroke, including the world’s first cell therapy in stroke patients. There will be a reception to honor Dr. Borlongan following his lecture.
The International Division of the Congress of Neurological Surgeons retains a strong presence serving the collaborative and educational mission of the CNS. In recent years, the division has enjoyed a chain of vigorous and energetic leaders, including Drs. Anil Nanda, Charles Liu, and Mustafa Baskaya. During this time, the CNS International Division has significantly expanded its breadth of influence across various world regions. Several key collaborative efforts that further the CNS presence and mission in the international arena should be noted, specifically, with the European Association of Neurosurgical Societies (EANS), the Neurological Society of India (NSI), the Turkish Neurosurgical Society (TNS), and in the current calendar year, the Continental Association of African Neurosurgical Societies (CAANS).

In 2013, a Memorandum of Understanding (MOU) was signed with the European Association of Neurosurgical Societies (EANS). It was the first MOU of its kind to be initiated between the CNS and another international partner organization. As part of this agreement, the CNS engages with EANS and its leadership at many levels; the primary effort is focused toward fulfilling the CNS educational mission. To date, there has been particular success in expanding the CNS Simulation Training Program at the EANS Annual Meeting, as well as increasing participation of CNS faculty and residents in the biannual EANS resident courses. While the collaboration was initiated by Dr. David Adelson, it has been growing stronger through the dedicated engagement of successive International Division chairs.

The CNS’s relationship with the Neurological Society of India (NSI) is also on solid ground. Intensive discussions that began between the CNS and NSI in 2013 resulted in a comprehensive MOU that was formalized at the 2014 CNS Annual Meeting in Boston, Massachusetts, under the leadership of prior CNS President Dr. Daniel Resnick and prior NSI President Dr. Vendantam Rajshekhar. In addition to fulfilling the educational mission, there are regular high-level interactions between the officers on the executive committees of both organizations each year at their respective Annual Meetings. The presidents of the CNS and NSI have also been afforded time to speak at the Plenary Sessions at mutual Annual Meetings and to present a summary of ongoing collaborative work at their respective executive committee meetings. In addition, the Simulation Program that was initiated by the CNS at the 2013 NSI Annual Meeting has enjoyed tremendous success.

Left to right: Ramesh Teegala, MD; Gerald Grant, MD; Shekar Kurpad, MD; Ashish Suri, MD
success and growth. The Simulation Program is now in its third year of functioning and represents a true collaborative effort with both organizations contributing simulation modules and newer modules being added every year.

The CNS has also signed an MOU with the Turkish Neurosurgical Society. Dr. Mustafa Baskaya was instrumental in initiating the collaboration that resulted in the MOU, with active participation by 2014-15 CNS President Nathan Selden. The CNS has been and continues to be active in the International Basic Neurosurgery Course hosted by the Turkish Neurosurgical Society as well as the TNS Annual Meeting in Antalya, Turkey. Under the leadership and guidance of Dr. Baskaya, the Turkish Neurosurgical Society collaboration continues to be healthy.

This year, the CNS is engaged with the Continental Association of African Neurosurgical Societies (CAANS) as a partner society. As many as 14 CNS Executive Committee members are planning to participate in the July 2016 CAANS Quadrennial Meeting in Cape Town, South Africa, with an equivalent reciprocal CAANS presence at the September 2016 CNS Annual Meeting in San Diego, California. CAANS President Graham Fieggen, Treasurer Mike Du Trevou, and CNS President Russell Lonser have been tireless in their efforts to ensure the success of this project. This exciting partnership represents the first time the CNS has initiated organized efforts on the African continent.

In summary, the International Division of the CNS is in an unprecedented state of good health, with a solid strategic mission that continues to strengthen our collaborative relationships and to initiate and grow new efforts in other world regions.
unkie. Stoner. Crackhead. We’ve all heard the terms used to describe those individuals who struggle with drug addiction. These terms are dismissive and disdainful; they reflect a moral judgment that is a relic of a bygone era when many thought that addiction was some sort of moral failing and should be a source of shame. We need to change the national discussion. Put simply, individuals with substance use disorders are our patients who need treatment.

Scientific progress has helped us understand that addiction—also referred to as substance use disorder—is a chronic disease of the brain. It is a disease that can be treated, and treated successfully. No one chooses to develop this disease. Instead, a combination of genetic predisposition and environmental stimulus—analogous to other chronic diseases like diabetes and hypertension—can result in physical changes to the brain’s circuitry, which leads to tolerance, cravings, and the characteristic compulsive and destructive behaviors of addiction that are such a large public health burden for our nation.

Consider that every day, 44 Americans die as a result of prescription opioid overdose, and the rate of heroin-related overdose deaths has nearly quadrupled since 2002. In addition, the nation is seeing an increase in opioid-related pediatric exposures and poisonings. There has been a distressing rise in neonatal abstinence syndrome as a result of women being exposed to opioids during pregnancy. Misuse by older adults also has become an increasing concern. The rate of opioid-related hospital admissions has increased significantly over the last two decades across all age cohorts. Because of higher rates of substance use disorders in the current “baby boomer” cohort, illicit and nonmedical drug use among older adults is expected to increase in the future.

Recognizing the urgency and serious impact of this issue, organized neurosurgery appointed Jennifer A. Sweet, MD, to serve on AMA’s Task Force to Reduce Opioid Abuse on behalf of the Joint Section on Pain. Dr. Sweet is an assistant professor of neurosurgery at the Case Western Research University School of Medicine and a neurosurgeon at the University Hospitals in Cleveland, Ohio. The AMA opioid task force aims to ensure that America’s physicians, patients, and policymakers take action in three ways.

First, we must change the conversation about what it means to have a substance use disorder, and we must increase access to evidence-based treatments. This means putting an end to stigma, increasing access to medication-assisted treatment (MAT) for opioid use disorder, and supporting the expanded use of naloxone—a life-saving medication that can reverse the effects of an opioid-related overdose. People with a substance use disorder deserve to be treated like any other patient with a medical disease, and physicians are helping the nation understand how to do this. This is the main reason the task force encourages increased education and training for MAT.

Second, we encourage physicians, dentists, and other prescribers of controlled substances to register for and use prescription drug monitoring programs (PDMP) as a tool to identify when a patient may need counseling and treatment for a substance use disorder. The trend among policymakers has been to use PDMPs to identify “doctor shoppers.” This, by itself, is important, but the real work is to understand why a patient is seeking medication from multiple prescribers or dispensers and to offer a pathway for treatment and recovery. The information in PDMPs can play a helpful role in identifying patients in need of help.

Third, we must do a better job with prevention. This includes intervening early with teens who initiate alcohol and/or marijuana use, as well as efforts to encourage safe storage and disposal. Unused medications increase the risk of nonmedical use by adolescents or by their friends. Unused medication also can be ingested by young children out of curiosity. Educating the public on the importance of storing opioid medications locked and out of the reach of children, and properly disposing opioid medications following the end of use, can encourage these safe practices.

Organized neurosurgery is committed to identifying the best practices to combat this public health crisis. Stigmatizing patients helps no one. Our goal is to treat patients and help them live as fully functional members of society.
Don’t Tase Me, Bro!

A 24-year-old man being chased by police was hit with a Taser in his back. The Taser barb became lodged in the patient’s back and could not be removed at the bedside. He demonstrated no neurological deficits on examination. Computed tomography (CT) imaging demonstrated that the barb was lodged in the spinous process of T11. The patient was taken to the operating room for removal of the Taser barb. The procedure was uncomplicated. The patient was discharged and never returned for follow-up.

Submitted by:
Kunal Gupta, MD, PhD and Khoi D. Than, MD
Department / University: Neurological Surgery / Oregon Health & Science University
Address: C8HN, 3303 S.W. Bond Ave., Portland, OR 97239

Figure 1: Taser barb entry site in patient’s back.

Figure 2: Axial CT image demonstrating Taser barb lodged in spinous process of T11.

Figure 3: Sagittal CT image demonstrating Taser barb lodged in spinous process of T11.
Meet Our Guest Speakers!

The CNS is thrilled to announce the following guest speakers appearing at the 2016 CNS Annual Meeting, September 24–28 in San Diego, California.

Steve Wozniak
A Silicon Valley icon, Steve Wozniak is the co-founder of Apple Computer Inc. and a longtime philanthropist. He helped shape the computing industry with his design of Apple's first line of products, the Apple I and II, and influenced the popular Macintosh.

Billy Beane
The Oakland A's Executive VP of Baseball Operations Billy Beane is one of the most progressive and talented baseball executives in the game today and was the inspirational subject of the book and film Moneyball.

Daniel James Brown
New York Times bestselling author Daniel James Brown wrote The Boys in the Boat: Nine Americans and Their Epic Quest for Gold at the 1936 Berlin Olympics, a true-to-life account of the 1936 US men's Olympic rowing team, currently being adapted into a major motion picture.

Visit cns.org/2016 to learn more about the 2016 CNS Annual Meeting

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