Young Neurosurgeons NEWS

American Association of Neurological Surgeons

Summer 2016

Young Neurosurgeons Committee

Editor: Edjah Nduom, MD

In This Issue...

Chair's Update

The 2016 American Association of Neurological Surgeons (AANS) Annual Scientific Meeting carried the theme "Neurosurgery Leading the Way." It brought together incredible speakers and a phenomenal program all highlighting the field of neurosurgery and how we can embrace the opportunities for us to remain leaders in our field and in medicine. From a panel of concussion experts discussing opportunities to better understand and prevent concussions in our military servicemen and professional athletes, to the Cushing orator, George W. Bush, who walked us through his reaction to an unforgettable moment in U.S. history, attendees of the meeting were presented with a diverse and stimulating program. The second annual Young Neurosurgeons Research Forum featured the Osler lecture by Duke Samson, MD, FAANS, who spoke of his own experience in confronting complications and dealing with grief, preparing the rising generations of neurosurgeons with an introduction into humanism in neurosurgery. The Young Neurosurgeons Luncheon featured Roberto Heros, MD, FAANS(L), the first chair of the Young Neurosurgeons Committee (YNC), lecturing on mentorship.

As I reflect upon the meeting theme, I am proud of how the AANS is leading the way in engaging medical students, residents and young neurosurgeons in leadership roles. The YNC newsletter continues to evolve to provide resources to our membership to prepare us to do the same. For those of you who were able to attend the YNC meeting, I hope it gave you a glimpse of the many ways our committee has been able to engage with the organization. I hope to see you all in San Diego in September for our next YNC meeting!

Sincerely,
Krystal L. Tomei, MD, MPH
Assistant Professor of Neurological Surgery
Rainbow Babies & Children's Hospital

Secretary's Message

Welcome to the Summer 2016 Newsletter! I'm excited to continue to bring you updates on all that we do on behalf of young neurosurgeons in a timely fashion while providing content that will be of interest to our medical student, resident and young practicing neurosurgeon members.

We start with highlights and pictures from the 2016 AANS Annual Scientific Meeting in Chicago; a great meeting in a great city. We have continued to expand our Career Corner in this issue. First, we are providing an article on mentorship and the transition we all experience of moving from being a mentee to starting to mentor other young neurosurgeons ourselves. In a related article, Khoi Than, MD, will present the interview he conducted with one of his key mentors, Karin Muraszko, MD, FAANS, a former co-chair of the Young Neurosurgeons Committee (YNC), on what the committee was like in her day and what it has meant to her career.

For our medical student members, we have put together some content for you as well. Douglas Hardesty, MD, has provided the first installment in a series designed to help medical students prepare for the neurosurgery resident application process. We also have an interview with our MISSION Fellow, Michael J. Strong, to give you all an idea of how the program has influenced his growth in organized neurosurgery – look out for applications for the MISSION Fellowship this summer! Finally, one of our medical student members from Mexico has provided an interesting look at how neurosurgical training is conducted in Mexico.

Please feel free to contact me with suggestions for our next newsletter. As always, this is your newsletter, so we welcome your input!

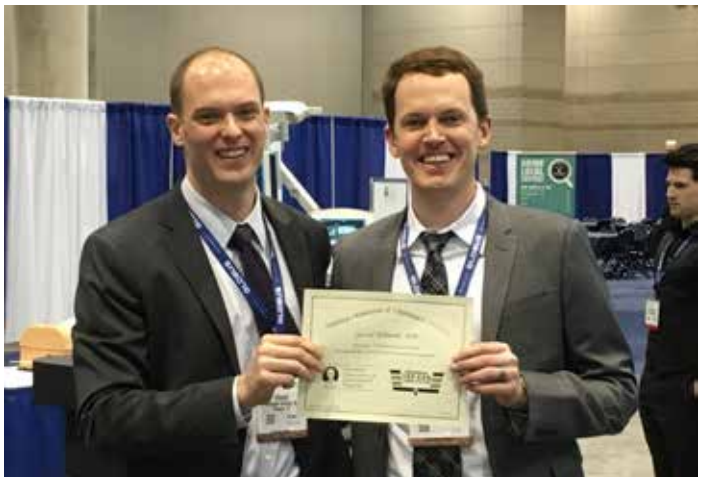
Thank you again for the opportunity to serve.

Sincerely,

Edjah Nduom, MD
Staff Clinician
Surgical Neurology Branch
National Institute of Neurological Disorders and Stroke
National Institutes of Health

Meeting Highlights

Here are a few meeting highlights provided by Young Neurosurgeons in attendance at the 2016 American Association of Neurological Surgeons (AANS) Annual Scientific Meeting in Chicago.

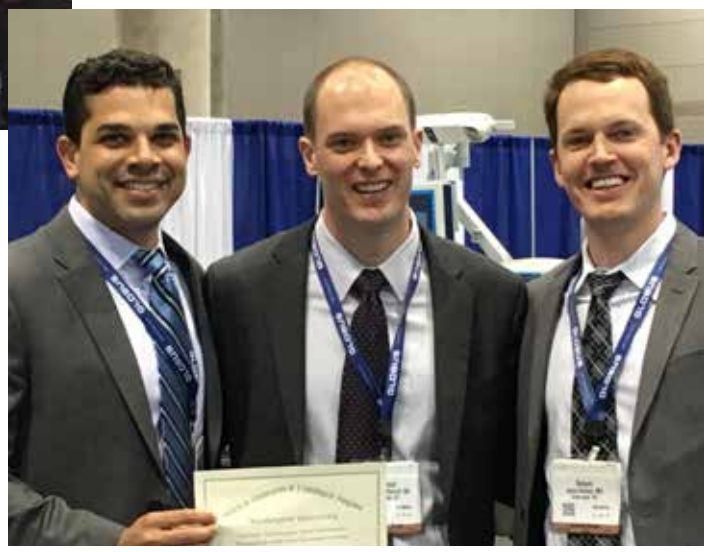


Neurousurgical Top Gun:
Kris Kimmell, MD, with Jarod Roland, MD, resident at Washington University and overall Neurosurgical Top Gun Top Honors winner

Young Neurosurgeons Research Forum:
Duke Sampson, MD, FAANS, presenting at Young Neurosurgeons Research Forum

Young Neurosurgeons Research Forum, Krystal Tomei, MD, Introducing Duke Sampson, MD, FAANS

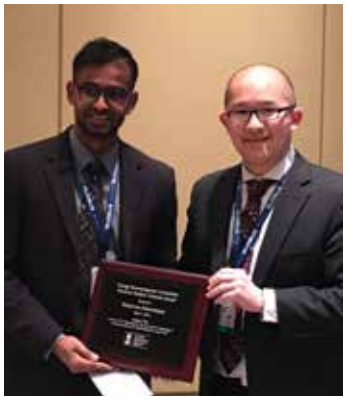
Young Neurosurgeons Research forum winners with Donald O. Quest, MD, FAANS; Duke Sampson, MD, FAANS; Krystal Tomei, MD; and Michael Strong, MD



First Place in the Team Competition, Washington University residents Eric J. Arias, MD, and Jarod Roland, MD, with Kris Kimmell, MD (center)

Young Neurosurgeons Luncheon:

Nancy Abu-Bonsrah, newly-elected YNC Medical Student member, with Khoi Than, MD



Branavan Manoranjan, Medical Student Abstract Award winner, with Khoi Than, MD

William T. Couldwell, MD, PhD, FAANS, presenting at the Tumor Section

Interview with M. Daniel Eggart, MD, Public Service Citation Recipient

M. Daniel Eggart, MD, a resident at LSU Neurosurgery New Orleans, was awarded the Young Neurosurgeons Committee (YNC) Public Service Citation award at the 2016 AANS Annual Scientific Meeting. Kimon Bekelis, MD, conducted this interview after Eggart received the award.

Kimon Bekelis (KB): First of all, we want to congratulate you on winning the YNC Public Service Citation. What was the inspiration for your involvement in public service and international health?

M. Daniel Eggart (ME): I would like to thank my parents, Drs. Jeff and Jeanne Eggart. My father, an OBGYN, and my mother, a periodontist, have served the needs of Low Country South Carolina and Haiti for 18 years. Their service record, faith and happiness have inspired me to emulate their lives. I also thank Dr. Frank Culicchia, chairman of LSU Neurosurgery New Orleans, who has encouraged me to continue international service in residency. Dr. Culicchia made annual trips to Thailand to operate and teach and now serves on the board of directors for FIENS, the Foundation for International Education in Neurologic Surgery. Through FIENS, he sponsored me to leave New Orleans in 2014 and work as a house officer for three months at CURE Hospital Uganda.

KB: How did your involvement with international service work start?

ME: In 2007, with Burn Care International, I traveled with two medical students to work in the pediatric burn center of Cochabamba, Bolivia. We carried a couple hundred Bolivian alpaca scarves back home with us in the hope of selling them to support orphaned children in the burn rehab center. Returning home to South Carolina, we did not anticipate the response to our first annual fundraiser. The demand far outstripped supply, which made for busy medical school holidays with exams, international shipping and scarf delivery. I am grateful for all of the help from my fellow medical students at the University of South Carolina School of Medicine; they put their hearts into this project, and it was only through a team approach and hard work that this project was successful.

KB: How different is the practice of neurosurgery in limited-resource settings?

ME: With limited resources, medical decision making relies more on history and examination and less on confirmatory tests and serial imaging. Treatments are targeted toward curable diseases, and surgeries are planned in accordance with facility capabilities. For example, a craniotomy that requires prolonged intubation in a hospital would require the utilization of the only OR ventilator, pausing all other surgeries. Otherwise, the patient would need 24-hour personnel to provide oxygen and bedside hand ventilation using a bag valve device.

KB: How do you envision making an impact in these communities after you graduate?

ME: One of the challenges with international health care is continuity of care and patient follow up. I do not know where I will work after graduation, but I think that wherever that is, my goal is to establish a medical record and a safety net to communicate with post-operative patients. This will have an impact greater than individual surgeries.

KB: What resources would you recommend to medical students and residents interested in their own international service projects?

ME: I recommend emailing FIENS. The organization does an excellent job sorting out where specific surgeons are working, and they can tailor your experience to your interests and skill level.

Editor: Do you know of a young neurosurgeon whose public service deserves recognition? Look out for the call for nominations for the 2017 Public Service Citation!

Interview with Dr Muraszko, Past YNC Chair

Karin Muraszko, MD, FAANS, is the chair and Julian T. Hoff, MD, Professor of Neurological Surgery at the University of Michigan. She served as the Young Neurosurgeons Committee (YNC) co-chair from 1996 to 1997. She was interviewed by Khoi Than, MD, our current vice-chair and one of her trainees, as part of our ongoing series examining how the YNC has changed over the years.

Khoi Than (KT): Tell me about your involvement in the YNC.

Karin Muraszko (KM): I became involved in the Young Neurosurgeons early in my career. I served as president of the organization and helped restructure it as it became more prominent within the workings of the AANS/CNS. Early on, this organization was primarily meant to help young neurosurgeons network. It soon grew beyond that and provided young neurosurgeons with the ability to stand as liaisons on all the major committees within the AANS and the CNS. I'm happy to say that I was part of that movement, which allowed young neurosurgeons to become more integrated within organized neurosurgery and thereby offer their services, as well as their talents, to organized neurosurgery.

KT: What were some of your accomplishments as YNC chair?

KM: As a YNC chair, among the important accomplishments that our group worked on were developing liaisons positions with the major organizations such as the CNS and the AANS. We were able to make certain that representatives of YNC sat on all major committees including the Scientific Program Committee of each group, the Executive Committee of each group, as well as important groups such as the Education Committee of the Congress and the Membership Committee of the AANS. Because we also saw that it was important that these individuals be allowed an opportunity to be known by their colleagues, we often made these appointments for two years. This allowed the young neurosurgeon involved a better opportunity to be known and valued, especially within the more significant committees.

KT: How did the YNC shape your continued involvement in neurosurgical leadership?

KM: The YNC provided me with strong mentoring as well as a network of individuals that I could rely on throughout my career. It also gave me a framework from which to launch a career that not only involved my own department but also organized neurosurgery. By allowing young neurosurgeons the opportunity to see how organized neurosurgery works, both nationally and locally, they become the catalyst for the thought process and allows one to develop his or her unique and individualized career. In my own case, it helped me understand

that I enjoyed leadership and that, in spite of being a pediatric neurosurgeon, it was possible to rise to a leadership position within neurosurgery.

KT: You have overcome major obstacles to get to where you are today. What are challenges that young neurosurgeons face today that you didn't have to face?

KM: Young neurosurgeons are often faced with obstacles, some of which they create for themselves and some which are placed upon them. Many young neurosurgeons believe that their focus must be absolutely laser on with respect to their own lives. They have a difficult time imagining that there can be multiple points of attack for a given problem or that a variety of methods could be used to obtain success. I'm struck by the fact that the world of organized medicine has changed drastically, even within the last five years. The demand of patients for always available, effable and affordable neurosurgical care has not changed. The extent to which a neurosurgeon may only worry about their medical and surgical skills is gone. The average neurosurgeon now must also worry about the upkeep on their practices. They must worry about the cost of their practice relative to the benefits they obtain.

Finally, I think the recognition of work-life balance has much greater importance for individuals of this generation then it did for those of the older generation. I anticipate that the young neurosurgeons of the future will in fact be strapped with more financial burden, greater financial obligations, and much less control of their individual lives.

A Neurosurgeon's Perspective on Surviving "The Match" - Part 1, Preparing to Apply

The residency application process understandably brings on palpable anxiety amongst neurosurgical applicants. Years of hard work and dedication to studies and research will be miniaturized into succinct, sterilized answers repeated a dozen times or more on the interview trail. And finally, a rather impersonal supercomputer will tabulate the preferences of the applicants and programs and render verdicts on Match Day, propelling applicants into cross-country moves and radical life changes. In the series of articles to follow, I would like to outline for our medical student members my strategies for the residency application process, and share ideas on how to survive The Match neurologically intact.

The key to any successful neurosurgical application begins well before the Electronic Residency Application Service (ERAS) applications are ever filled out. That key is a strong academic background. Every applicant should strive to score as high as possible on the United States Medical Licensing Exam (USMLE) Step 1 examination, since it is one of the few universal comparisons between applications. This test may have very little to do with being a good neurosurgeon, but it has a great deal to do with becoming a neurosurgeon, period, and it should thus be taken very seriously. If the Alpha Omega Alpha honor society is available at your institution, attaining this honor can also help to set you apart from your peers. Similarly, although core clerkship grades may be inflated or deflated at individual schools, each neurosurgical applicant owes it to him or herself to collect as many Honors grades as possible during their clinical curriculum. An Honors grade in the Surgery core rotation is nearly essential, and some programs use this metric as a determinant for even granting interviews. The practice of pediatrics or family medicine may not seem to correlate at all with neurosurgery, but Honors grades, even in the non-surgical specialties, demonstrate a strong commitment to getting the job done and performing well even while performing duties that one may not strongly desire to do. You could, in fact, argue that this is a key characteristic of a good neurosurgical resident.

Regarding research, the importance of this varies from institution to institution, but historically, most neurosurgery residency programs have incorporated some amount of research time into the core residency schedule. This is particularly true of some of the more competitive programs at big universities. If that is the sort of institution where you would like to train, it should be reflected in your time and your research experiences. If you have a PhD or publications from an honors thesis, gap year or Master's degree, those are fantastic, but even the medical student who is planning to go straight through to medical school and then to residency can demonstrate an aptitude for research along the way. Offer to help dig through charts for a clinical trial, offer to present an interesting case at a regional meeting, or submit an abstract to one of the national meetings, then see if you can get it accepted by one of the neurosurgical journals. Of note, the research performed does not have to be directly related to neurosurgery. If you came to neurosurgery late, but you spent your first summer writing up a clinical trial on skin cream, that is still good, as you will have demonstrated an aptitude for research. No one is expecting a medical student to be ready to apply for an R01 grant before residency, but showing that you are interested in research and, perhaps as important, are capable of completing a project, can be very valuable.

Lastly, the successful applicant must engage with neurosurgeons in a meaningful way. This allows for important mentorship and, critically, allows mentors to write more personal and compelling letters of recommendation. These letters of recommendation can make or break the application of borderline candidates well before the interview. For those applicants at medical schools that do not have a strong neurosurgery presence, away rotations take on added significance, as one must find a way to attract strong letters of recommendation from well-respected neurosurgeons. An unexpectedly long and glowing letter about an applicant can go a long way towards smoothing over deficiencies elsewhere in the application. Similarly, many a candidate who looks amazing on paper has been hurt greatly by recommendations that are lukewarm or downright cold. Participating in organized neurosurgery, through an AANS Medical Student Chapter, the MISSION fellowship or as a YNC Medical Student member is another way to show your dedication to neurosurgery and obtain an additional set of mentors who could make a phone call on your behalf or write a letter when the application process comes around.

We hope that these tips help those of you considering a career in what we believe is truly the greatest specialty there is. Have questions? Let us know! Look out for Part 2 of this series in the Fall 2016 newsletter!

Douglas Hardesty, MD, is a fifth-year neurosurgical resident at the Barrow Neurological Institute and an elected member of the AANS Young Neurosurgeons Committee. He may be reached at Douglas.Hardesty@barrowbrainandspine.com. *He would like to acknowledge BNI Residency Program Director Peter Nakaji, MD, FAANS, for feedback on this article*

YNC Subcommittees

Young Neurosurgeons Luncheon:
This year's event went well, with Khoi Than, MD, taking over the reins mid-cycle from Gabe Zada, MD, PhD, FRCS. Roberto Heros, MD, FAANS(L), provided a wonderful lecture, and the Public Service Citation and Young Neurosurgeon Research Form Awards were given.

Marshals:
The Marshals program went well this year with the help of Lily Talan, education coordinator for the AANS. We had a relatively low no-show rate for Marshals this year and are working on ways to automate the system to increase effectiveness for next year.

Top Gun:
The competition had a continued increase in stations participation this year, particularly from our medical student members. Pictures of the winners are included in the "Annual Meeting Highlights" section.

YNC Newsletter:
The shift to post-meeting newsletters is complete! To ensure an on-time delivery of the publication, we are asking that any new ideas for articles come to us before the annual meetings of the AANS and CNS, instead of after, for inclusion in the next newsletter. Please forward any ideas to Edjah Nduom, MD, at dreknduom@gmail.com.

YNC Information Technology:
The YNC Twitter feed has about half the followers as the AANS feed. Anyone interesting in submitting an idea for a YNC logo should contact Jeremiah Johnson, MD, at jjohnson.neuro@gmail.com.

Medical Students:
The medical student category is the fastest growing AANS membership category. Current chapters range in size from six to more than 200 students. Last year, of the 49 submitted abstracts from Chapter members, 40 were accepted. YNC medical student members are encouraged to start a chapter at their institutions.

Communications Division
Public Education: The committee is working towards creating a comprehensive online platform describing neurosurgical procedures and the risks associated with them with simplified language in order to be compliant with guidelines from the American College of Surgeons (ACS).

NREF Development:
The committee reports increasing contributions by individuals and industry sponsors. The "Honor Your Mentor" (HYM) initiative has been the most successful endeavor undertaken by the committee. Amanda Saratsis, MD, also noted that NREF is looking to collect testimonials from grateful AANS members' patients. Please contact her at ASaratsis@luriechildrens.org.

Information Technology:
The most discussed topics were:

1) The newly-approved AANS Neurosurgery Technology Development Grant which is a collaborative effort between the IT Committee and YNC. The current questions are how to best advertise it to students, residents and fellows. Current ideas are blog posts, e-blasts, YNC/AANS Twitter feeds, AANS E-news and reaching out to medical student chapters as well as residency program coordinators;

2) Single sign-on to all the neurosurgery resources as well as a comprehensive AANS app; and

3) Ongoing discussion about electronic availability of Greenberg Handbook.

AANS Neurosurgeon:
The latest issue of *AANS Neurosurgeon* came out in June. The theme is ACOs, Mergers and Acquisitions. The next issue will be published in September, and the theme is neurotrauma. Anyone interested in contributing to the publication should contact Kris Kimmel, MD, at kkimmell@gmail.com.

Education Division
EPM Committee: Debraj Mukherjee,MD, reported that residents who would like to provide a 10-15 minute CME talk for the AANS on specific topics should see him.

CME/MOC:
The MOC is changing the 10-year examination cycle to an annual one-hour learning tool and that they are investigating a reduction of CME requirements.

Operations Division
Board of Directors: Krystal Tomei, MD, reported on the Board's continued interest in YNC activities with medical students.

Ethics:
Andrew Carlson, MD, reported that the discussion focused on conflicts of interest.

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Affiliated Organizations Division

Joint Guidelines: The committee discussed new ways to provide sustainable training on evidence creation and evaluation, including online availability of an educational PowerPoint. There were at least six guideline documents reviewed by the committee since the last meeting. There was a considerable push for guideline development by the committee members themselves.

Washington Committee:

The committee discussed current issues of duty hours and concurrent surgery.

ThinkFirst:

There was a well-attended 30th Anniversary celebration of the organization at the House of Blues in Chicago. The new president-elect is Rocco Armonda, MD, FAANS.

Sections Division:

Cerebrovascular (CV): The CV Section is currently finalizing the institutional CAST approval process for open and endovascular fellowship programs. The number of approved fellowships are continuing to rise. Additionally, there has been an increase in funding for various resident, fellow and young attending clinical and basic research grants, the details of which can be found on the joint section website. The next CV Section Annual Meeting will take place Feb. 20-21, 2017, in Houston.

History:

The History Section produced videos highlighting the meeting theme: "Neurosurgery Leading the Way." These were featured at the 2016 AANS Annual Scientific Meeting and are now available on the AANS YouTube channel. The section is welcoming anyone, especially young neurosurgeons, to get involved in the History section by sending new ideas,helping with the annual history video and planning of the next meeting.

Pain:

The Pain Section is offering the Oakley Fellowship this year, which supports a two to three month traveling experience to learn neurosurgical pain techniques to all interested residents, PGY-4 and above, fellows and attendings in the first two years of practice. Look out for the 2017 biennial pain meeting which will feature seminars and practical clinics in neuromodulation as well as neuroablation techniques.

Pediatrics:

The "fast abstract" concept was well received at the Pediatric Section annual meeting, and it will continue to allow two-minute talks on approved abstracts for medical students and residents. They will host their annual meeting Dec. 5-8, 2016, in Orlando, Fla.

Spine and Peripheral Nerve:

The past annual meeting was very successful with nearly 600 attendees. Follow the section on Twitter at @spinesection. They will host their next annual meeting in March 8-11, 2017, in Las Vegas.

Stereotactic Functional:

The American Society for Stereotactic and Functional Neurosurgery (ASSFN) hosted a successful resident social hour at the last CNS annual meeting and will host another this year at the CNS in San Diego. This is a forum for all interested medical students, residents and fellows to learn more about fellowship and new job opportunities and interact with the leaders in the field of functional neurosurgery. For more information regarding functional neurosurgery fellowship programs in the U.S. and Canada, visit the education section of ASSFN's recently updated website at http://www.assfn.org/education.html. Additionally, the Journal of Stereotactic and Functional Neurosurgery (SFN) has a growing impact factor and encourages young neurosurgeons to submit their manuscripts. The ASSFN biennial meeting took place this year in Chicago, from June 18-21.

Neurotrauma:

The section is finalizing multiple guidelines that are in the process of publication. Additionally, they have launched a webinar series on "hot button" topics, including football injuries and concussion, progesterone treatment for TBI and multimodality monitoring. Both can be accessed on their website. They hosted their National Neurotrauma Symposium June 26-29, 2016, in Lexington, Ky.

Tumor:

The Tumor Section will introduce the Parsa fund, in honor of the late Andrew Parsa, MD, PhD, to sponsor mentored research in neuro-oncology for young neurosurgeons. The Young Neurosurgeon Reception at the 2016 AANS Annual Meeting went well, with honored guest and former AANS president, William Couldwell, MD, FAANS, who spoke on the importance of mentorship. They will host their biennial satellite tumor symposium in conjunction with the CNS Annual Meeting Sept. 23-24, 2016, in San Diego.

Women in Neurosurgery (WINS):

This year, WINS has been involved in recommending adoption of new guidelines changes to the American Board of Neurological Surgery (ABNS) with respect to medical and family leave extensions for board certification requirements during the first five years of practice. WINS continues to offer a successful mentorship program for medical students and encourages new applicants. Also, this year WINS has developed a new initiative called "Lean-In" circles to foster support and leadership amongst the female neurosurgery community and encourages young members to get involved.

YNC MISSION Fellow Interview

Michael J. Strong is a rising fourth year MD/PhD student at Tulane University and a current MISSION fellow of the YNC. Ann Liu is an MS4 at Wake Forest School of Medicine and conducted this interview.

Ann Liu (AL): How did you hear about the MISSION Fellowship and what made you apply?

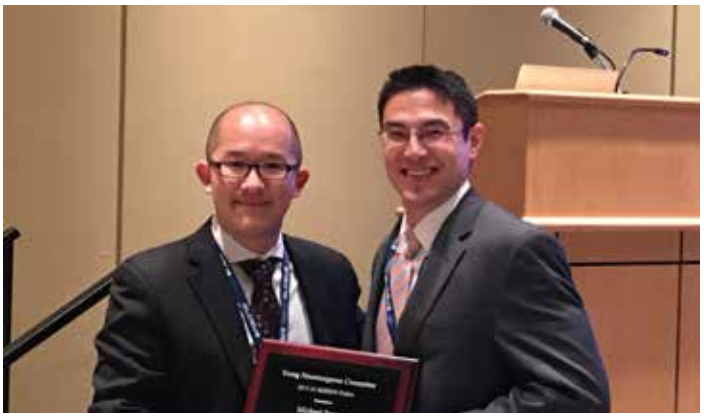
Michael Strong (MS): I heard about the MISSION Fellowship through the American Association of Neurological Surgeons (AANS) website. I believe the largest factors driving medical students to pursue a career in neurosurgery are mentorship from established neurosurgeons and early exposure to the field. As a medical student, I have had the fortunate opportunity to engage in various aspects of the field through interactions with several outstanding mentors, which have solidified my interest in and continued pursuit of a career in neurosurgery. The YNC MISSION Fellowship provides the perfect opportunity to help bring a medical student's perspective to the committee to help guide mentoring efforts and other opportunities to medical students on a national, organized level. This concerted effort to increase early exposure to neurosurgery and mentorship opportunities is the reason why I applied to be a YNC MISSION Fellow.

AL: Applicants are required to propose a research topic addressing a system/practice issue—what did you propose and how did you come up with the idea? How is the project going so far?

MS: My proposed research topic, in a general sense, is to determine why medical students pursue a career in neurosurgery. This idea was developed in partnership with my YNC MISSION Fellowship mentor, Debraj "Raj" Mukherjee, MD. Our thought was to take advantage of the recent establishment of the AANS medical student chapters across the nation and generate measurable data that we could use as a framework to better attract medical students to the field. Our goal is to accrue this data over time. We have designed a survey that is currently being vetted by AANS leadership, and we plan on sending it out to the AANS Medical Student Chapter members soon.

AL: What YNC subcommittees have you been able to get involved with and what has been your experience so far with them?

MS: I am a medical student member of the Cerebrovascular section. Recently, I became involved with the Spine section by helping to establish a medical student membership within the section.



Michael Strong MISSION fellow

AL: How has your experience been attending the YNC meetings and the AANS Annual Scientific Meeting?

MS: Attending the AANS Annual Scientific Meetings has been an amazing experience. The ability to listen to experts in the field present cutting edge research and techniques is incredible. The numerous social and networking opportunities are always fun and a great opportunity to meet people.

Sitting at the YNC meetings the last couple of years has been a truly rewarding experience. Each time I attend, I learn something new. The opportunity to interact with the young faculty of organized neurosurgery is humbling. I highly recommend all medical students interested in neurosurgery to attend the YNC meetings at the AANS and Congress of Neurological Surgeons (CNS) annual meetings.

AL: What are your future career plans/where are you headed next?

MS: My future career plans are to pursue a career as a physician scientist in the field of neurological surgery. As for where I am headed next, only time will tell. I will be applying for residency this coming year.

AL: Any other comments about the fellowship?

MS: As a MISSION fellow for the YNC committee, I have had the opportunity to engage in various activities that will potentially promote and stimulate the pursuit for excellence in neurosurgery. I would like to thank the AANS Executive Committee and the YNC leadership for establishing this opportunity through the MISSION Fellowship. I would also like to thank my fellowship mentor, Dr. Raj Mukherjee, for his guidance and continued support.

Career Corner: Mentorship

Casey Halpern, MD, is an assistant professor of neurosurgery at Stanford University. We asked him to present a reflection on mentorship and how it helped him successfully transition from being a medical student to a faculty member at an academic institution.

Mentorship has been a critical part of my early career development. Given an early interest in neurosciences, I joined the laboratory of Murray Grossman, MD, while in college at the University of Pennsylvania (Penn). We used various neuroimaging techniques to identify neural correlates of cognition and cognitive deficits in various dementia subtypes. During all four years of my undergraduate period, I learned how to develop testable hypotheses, present findings in both poster and oral platform format and write papers summarizing our findings. I stayed at Penn for medical school where I continued working with Dr. Grossman, but developed an interest in neurosurgery. I began attending Grand Rounds and various teaching and journal clubs that were designed for resident training. These meetings provided me an opportunity to introduce myself to all of the neurosurgical residents in Penn's program. I quickly joined various research teams and implemented some of the skills I had learned in my prior experiences to neurosurgical studies, ranging from basic science to clinical research. I found that developing strong ties with the residents at Penn was another invaluable source of mentorship as I began to model my preparation for a residency application after their successful approaches. Needless to say, these residents also became amazing advocates for me as I interviewed for a residency position, not only at Penn, but also at many programs across the country.

After matching at Penn, mentorship only continued to grow in importance. Developing role models to emulate both in the clinics and in the operating room was the crux of my training. With an interest in functional neurosurgery, I worked very closely with Gordon Baltuch, MD, PhD, FAANS, with whom I did an enfolded fellowship and learned the fundamentals of epilepsy and deep brain stimulation surgery (DBS). I spent my protected research time immersed in the basic science laboratory of Tracy Bale, MD, who taught me how to best identify mouse models suitable for testing mechanisms and the expanding indications of DBS. With this clinical and research fellowship during my seven-year training program, I felt well-prepared for an assistant professor position with an independent laboratory at Stanford University.

It was of no surprise to me that my inclination to seek out mentorship did not stop when I finished my training. When I started at Stanford, I adopted the frameless stereotactic techniques of Jaimie Henderson, MD, FAANS, who provided me with tremendous guidance as I initiated my practice. As my partner in functional neurosurgery, we continue to work together to meet the needs of our growing specialty, but I never hesitate to seek out his input on complicated cases. As my mentors at Penn taught me, residency is best intended to provide us with the fundamentals of neurosurgery as well as to prepare us to continue to learn new techniques following training. Within six months of starting at Stanford, I was performing DBS and other stereotactic procedures routinely using techniques I never attempted as a resident. I am grateful for all of my mentors who provided me with a rich foundation of skills that I plan to spend the rest of my career building.

Book Reviews

"Handbook of Skull Base Surgery"

Antonio Di Ieva, MD; John M. Lee, MD, FAANS; Michael D. Cusimano, MD, PHD, FAACS, FRCS

This is an excellent, quick-reference text that attempts to cover all things related to the skull base, primarily from a neurosurgical perspective, though topics of interest to otorhinolaryngologists are also covered. That said, it is not a comprehensive reference, as it lacks the diagrams and depth to act as a sole source of reference for the varied complex approaches to skull base pathology. Also, while approaches for vascular pathologies are discussed in the description of various surgical approaches to the skull base, the diseases referenced are predominantly neoplastic in nature, so it is, in effect, more of a handbook of skull base tumor surgery than a handbook of skull base surgery in general. The book covers quite a bit of ground with its bulleted format, starting with general principles and preoperative evaluation, then discussing surgical approaches to skull base pathology, primarily organized by anatomical location and then focusing on the post-operative concerns faced by these patients. All in all, this is a great quick guide for residents interested in pursuing a career in skull base surgery or the practicing neurosurgeon looking for a refresher on skull base topics.

"Synopsis of Spine Surgery"

Howard S. An; Kern Singh, MD

This slim reference is designed as a bulleted, quick-reference guide to cover all of spine surgery. It is written from an orthopaedic surgeon's perspective, though it is aimed at both neurosurgeons in

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training and orthopaedic surgeons in training. Given that it aims to be a portable reference guide, it is not a comprehensive text and is certainly best suited to those physicians that do not actively practice in spinal surgery, as it lacks the requisite depth needed by a practicing physician. That said, for the trainee who wants to quickly gain information on a particular portion of spinal anatomy, the physical examination of a patient with spine disease or spinal trauma, this book can provide a scaffolding from which to build upon. Each chapter does provide suggested reading for the trainee looking to explore any particular topic in further depth.

"Neurosurgery Board Review"

Cargill H. Alleyne Jr., MD, FAANS; M. Neil Wodall; Jonathan Stuart Citow, MD, FAANS

Any neurosurgery resident who has prepared for and taken the written neurosurgical board examination will be at least partially familiar, if not intimately so, with an edition of Neurosurgery Board Review. Now in its third edition, this concise question and answer text is an invaluable addition to the war chest for any resident preparing for the written examination. With over 1,000 questions in this edition, the book provides the necessary repetitions that a resident needs to drill the minutiae often tested on the examination into one's mind. While not intended to be a primary reference text, the more detailed answers to various questions, together with numerous illustrations and anatomical dissections provided from the Rhoton Collection®, provide a great deal of primary reference information to study in addition to the value gained simply by answering questions as a tool for recall. The updates to the reference greatly enhance its value and make it as close to a must-own resource as one could find in neurosurgical board preparation.

"Handbook of Spine Surgery"

Ali A. Baaj, MD, FAANS; Praveen V. Mummaneni, MD, FAANS; Juan S. Uribe, MD; Alexander R. Vaccaro; Mark S. Greenberg, MD, FAANS

This is a handbook of spinal surgery written by neurosurgeons and aimed primarily at residents and physicians that care for patients with spinal pathology. The bulleted format is meant to hit highlights on each topic, and each chapter contains a few questions that are similar to what one might encounter during one's board examination. The handbook is split into sections covering Anatomy, Clinical Spine Surgery, Spinal Pathology and Surgical Approaches. They also provide an appendix that provides information on positioning of spinal surgery patients, spinal orthoses and outcome scales. With the breadth of readily available information and board-friendly questions, this is a great reference for those looking to quickly brush up on spine surgery topics, whether before a case, during a rotation or as part of comprehensive board preparation.

"Neuro-Ophthalmology Illustrated"

Valerie Biousse; Nancy J. Newman, MD

Neuro-ophthalmology is a hybrid field, sitting at the junction between the brain and the visual system. It can be frustratingly complex due to the rare disorders that it covers and the detail required to separate one obscure disorder from another. For trainees or practicing physicians navigating these disorders, Neuro-Ophthalmology Illustrated provides a wonderful guide. While the level of detail in this bulleted text may not be enough for a practicing neuro-ophthalmologist, for the neurologically-oriented trainee, the rich color illustrations, diagrams and photographs provide a wealth of information that can be used to better understand neuro-ophthalmological pathology and the physical exam findings associated with these. Of particular value are the various fundoscopic pictures and photograph series that examine the various ophthalmoplegias that are associated with various diseases. This is an excellent text for the training or practicing neurosurgeon who frequently encounters disorders of the optic pathways.

"Early Onset Scoliosis"

Colin Nnadi

Early onset scoliosis, scoliosis that develops between birth and the age of 10 years old, has become a focus of many clinicians due the profound functional consequences of this condition. These conditions require coordinated multidisciplinary care that can involve massive surgeries. This text aims to provide a reference to all physicians involved in the care of these patients, from spine surgeons to rehab physicians. By examining topics such as growth and development, neuromuscular scoliosis and perioperative care, the authors attempt to cover the breadth of the conditions encountered by those that treat these children, while sections such as "The Experts' View," "International Viewpoints" and "The Future" put treatment of these conditions into the broader context of medical care. For those interested in these disorders, this book provides a great starting point from which to understand the best approaches to these related conditions.

"Facial Nerve Disorders and Diseases: Diagnosis and Management"

Orlando Guntinas-Lichius, Barry M. Shaitkin, MD

The anatomy of the facial nerve and its relationship to various structures can be a daunting subject to study due to its complexity. As neurosurgeons, we tend to be most familiar with the ways in which it interacts with pathologies that are common in neurosurgical practice. This book focuses on the facial nerve itself, reviewing its primary pathologies, its physiology, anatomy and the ways in which it is affected by various surgical and non-surgical disorders. This is a very thorough text for anyone that has any questions about any aspect of facial nerve physiology or pathology. They also provide 16 videos that accompany the text that can

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be accessed online with purchase of the book. This would be a wonderful addition to the detailed reference library of any practice or residency program that manages skull base pathology to help better understand this vital cranial nerve.

"Intracranial Stereotactic Radiosurgery"

L. Dade Lunsford, MD, FAANS; Jason P. Sheehan, MD, PhD, FAANS

This is the second edition of a text that has continued to evolve with the rapidly advancing field of radiosurgery. By focusing only on cranial radiosurgery, the authors are able to present a great depth of information about the approach to various different pathologies. After handling the history and fundamentals of radiosurgery, including the physics involved, the text focuses on the various pathologies that are approached with intracranial radiosurgery, vascular disorders, benign and malignant tumors, pediatric and ocular lesions as well as functional disorders. The chapters are based on the available literature, and provide patient images and treatment plans to help the reader understand the approaches to each lesion. This is an excellent reference text for any resident or practicing physician who wants to better understand intracranial stereotactic radiosurgery.

"Spine Radiosurgery"

Peter C. Gerszten; Samuel Ryu, MD

This is the second edition of a reference text focused solely on radiosurgery for spinal lesions. Spinal radiosurgery has made several changes in how spinal pathology is approached, and this provides an excellent reference not only for those who treat patients with radiosurgery, but also patients that treat spinal lesions surgically. They go over the radiobiology of stereotactic radio surgery (SRS) and how it differs from conventional radiotherapy, then focus on physics, spine metastases, benign and malignant spinal cord lesions and then end by covering how to integrate spine radiosurgery into the treatment of metastatic spinal lesions. With this well-referenced volume, one has all the relevant information needed to see how best to incorporate spinal radiosurgery into one's practice.

"Brain Tumor Imaging"

Rajan Jain, Marco Essig, MD

In comparison to the more widely available imaging atlases which show the appearance of various pathologies on different imaging modalities, Brain Tumor Imaging is a reference that spends time explaining the various techniques and how they can be used to image brain tumors. This makes it a valuable complement to the other imaging atlases that would typically be present in the library of a practice or residency program. The authors aim to put the various imaging techniques into context, letting the reader know what information can be gained from fMRI vs. DTI tractography or the advantages and disadvantages of PET imaging versus MRI perfusion in determining pseudoprogression versus tumor recurrence. In this way, the text is quite comprehensive, covering the various tools that a neuro-oncologist, neurosurgical oncologist or neuroradiologist use in diagnosing and following intracranial lesions.

"Neurovascular Surgery"

Robert F. Spetzler, MD, FAANS; M. Yashar S. Kalani, MD; Peter Nakaji

Neurovascular surgery has been written as a comprehensive, thorough reference text that covers all things related to cerebrovascular disease for the neurosurgeon. They begin with development, anatomy and physiology of the cerebrovascular system and then discuss evaluation of patients with potential cerebrovascular pathology. From there, the text is mostly organized by pathology, covering ischemic disease, cavernous malformations, aneurysms, arteriovenous malformations and fistulas and finally, disorders of ephatic transmission, such as trigeminal neuralgia and hemifacial spasm. They also cover surgical approaches, cerebral revascularization and the vascular considerations in the management of tumors. In addition, each text comes with web access to a collection of videos that accompany many of the chapters, helping to illustrate the content provided. This would make a welcome addition to the library of any practicing neurosurgeon and would help provide a strong base reference for any residency program.

"Imaging of Neurodegenerative Disease"

Sangam G. Kanekar, MD

With the aging population and the need to treat more of these patients, the number of patients who are referred to neurosurgeons with neurodegenerative disorders is only going to continue to increase. While many of these diseases are non-surgical in nature, there is enough overlap between many of them and certain diseases that do have surgical treatments, such as normal pressure hydrocephalus and Parkinson's disease, that it is important for the practicing neurosurgeon to know how to distinguish these disorders on imaging. The text explains these all in depth, examining the clinical findings, imaging findings and even correlating these with the pathological findings in each condition. This is an excellent reference text for any resident or practicing physician to ensure that they have a thorough grasp of the imaging evaluation of these diseases.

"Atlas of Neurosurgical Techniques, Brain"

Laligam N. Sekhar, MD, FAANS; Richard G. Fessler, MD, PhD, FAANS

This two-volume text was developed with residents and junior faculty in mind. The idea is to give those who are just getting started in their careers a way to quickly call up information on various neurosurgical techniques, all contained within one reference. Now in its second edition, the atlas contains numerous chapters addressing various pathologies and how best to approach

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them surgically, and they have added several videos that can be accessed online to further supplement the information presented. Each chapter includes information on patient selection, the considerations for choosing an operative approach, positioning, the finer points of the relevant techniques as well as a discussion of potential complications and their avoidance – something particularly relevant as one prepares for oral board examination. This is an excellent reference for the young neurosurgeon looking for a cranial operative atlas to refer to quickly the night before a case.

"Pediatric Neurosurgery"

Alan R. Cohen, MD, FAANS

We have all heard the old saying that when it comes to medicine, children are not just "little adults." For that reason, pediatric neurosurgery can be quite challenging, given that most of us spend the majority of our residencies treating adults. As such, there is a definite need for resources that address the neurosurgical conditions of this patient population. This text attempts to fill this void by asking pediatric neurosurgeons across the field to present their tips and tricks to help neurosurgeons identify ways to improve their pediatric practice. Each chapter presents the relevant background for a given condition, the factors one must consider while evaluating a patient for surgery together with tips for surgical management and what to expect after surgery. This text is also accompanied by videos which can be accessed online. For any pediatric neurosurgeon building their practice or any neurosurgery residency program building its library, this provides an excellent quick reference to get a concise understanding of any given problem or procedure before working up a given pediatric patient.

"Endovascular Surgical Neuroradiology – Theory and Clinical Practice"

Charles J. Prestigiacomo, MD, FAANS

Endovascular neurosurgery as a neurosurgical subspecialty has experienced rapid growth and expansion of its indications over the last several years. The average neurosurgeon now needs to have a good understanding of where and how endovascular management is the right option for one's patients, and this is becoming a requirement for residency training. This book attempts to provide this information by presenting a general overview of neurovascular biology and the perioperative management of these patients before then focusing on the treatment of the neurovascular pathologies that can be treated in this way. The text includes complication avoidance as part of its educational materials, and each chapter ends with a brief summary of a few bulleted points to ensure that the salient points are remembered by the reader. This text will provide a broad introduction to endovascular therapy for the training or practicing neurosurgeon.

"Atlas of Anatomy"

Anne M. Gilroy, Brian R. MacPherson, MD

While the average practicing neurosurgeon is beyond the days of repetitive memorization that characterize the anatomy lab of one's first year of medical school, an anatomy atlas remains helpful in practice, particularly when one is exploring those areas of the body that are not often visited. While there is little new in anatomy, the resources available have changed significantly, and this edition of the Atlas of Anatomy bolsters its well indexed collection of anatomical pictures with sectional anatomy radiographic anatomy that helps to put the anatomy into clinical context. For medical students, the volume also comes with access to WinkingSkull.com, an anatomy question-and-answer resource for study. For the student just starting on their medical journey or for a neurosurgeon looking to replace an outdated atlas in his or her library, this is a wonderful option.

"Neuroendoscopic Surgery"

Jaime Torres-Corzo, MD; Leonardo Rangell-Castilla, MD; Peter Nakaji

The use of the endoscope in neurosurgery is no longer something that is confined to the practice of a few specialists. While there are excellent and highly specialized neurosurgeons who will use the endoscope to push the envelope of neuroendoscopic surgery, the general neurosurgeon of today is expected to have a basic understanding of the use of the endoscope for procedures, such as endoscopic third ventriculostomies and endoscopic biopsies. This text has been developed to focus specifically on the indications for the use of neuroendoscopy for intraventricular and extra-axial intracranial applications. While there is some discussion of endoscope-assisted surgery, the considerations for endoscopic skull base surgery are not covered. This should be viewed as a strength, as the text and numerous accompanying videos provide an extremely comprehensive yet focused review of the ability of a neurosurgeon to use the endoscope to approach this subset of lesions. As we continue to push the frontiers of minimally invasive neurosurgery, this text is a great book to have as a reference while one ponders the possibilities offered by neuroendoscopy for our patients.

The Path to Neurosurgery in Mexico

By Alberto Varon, 5th year medical student at Universidad Anáhuac and president of the AANS Medical student chapter

Every year in Mexico around 30,000 medical graduates compete for a places in residency programs. An exam, the national examination of aspirants to a medical residency [ENARM], is administered and verified by the Interinstitutional Commission for the Formation of Human Resources in Healthcare [CIFHRS]. The exam is similar to what the UMSLE represents to U.S. medical programs, but it is only one test that can be presented annually. Before taking the exam, medical graduates choose which of the specialties they are applying for. Even though one may end up with a great score for a particularly specialty, if that is not the one for which the medical student registered, the student may end up being left out. Last year alone 33,434 candidates took the exam, but only 7,529 (22.5%) 'matched' into a program. 25,905 medical graduates were left out of their pursuit of a medical specialty for at least a year, until they can try again.

There are two types of residency programs recognized by the Secretariat of Health. The first type is considered a "direct entry" program, in which a graduate can enter immediately after obtaining the score required for the specialty of their choice on the ENARM. Neurosurgery is an "indirect entry" program, as one is required to apply for and successfully complete one year of general surgery to be eligible to transfer to a neurosurgical training program.

In Mexico there are currently 16 neurosurgical programs, as reported on the Mexican Society of Neurological Surgeons' [SMCN] webpage. There are a few differences in term of pre-requisites for different programs, but they all require at least one year of general surgery. In general, as in the United States, the neurosurgery programs are very competitive, demanding the most dedicated and experienced applicants in both research and academics.

Samuel Romano, MD is currently the neurological surgery chief resident at the Instituto Nacional de Neurologia y Neurocirugia.

In general, could you share your experience while doing the residency in neurosurgery in Mexico?
Neurosurgery residency in Mexico is a great experience. Even though not all hospitals manage patients the same way, I think that one of the things that stands out in most hospitals is the opportunity to get involved with a great number of patients with different pathologies and to have an active part in treating them. It is certainly not an easy specialty to choose, and it takes a lot of determination and "love for the art" in order to be able to endure the hard and long working hours and shifts, but in the end it is all worth it.

How many years of training are required? Are all programs the same?
Not all neurosurgery programs in Mexico are the same. In general, we are required to have successfully completed at least one year of general surgery in order to be able to apply for neurosurgery and neurosurgery itself lasts for 5 years. That said, each hospital has its own acceptance process and criteria, and there are also differences in the syllabuses.

Can you briefly describe each year of residency at your institution?
PGY-1: Each month is spent with a different service including neurosurgery hospitalization ward, neuro-endocrinology, neuro-ophthalmology, neurology hospitalization ward and emergency room.

PGY-2: Each month is also spent with different services including operating room, post-op care unit/intermediate care unit, radiosurgery and the neurosurgery hospitalization ward. During the operating room rotation, you assist in all fields of neurosurgery.

PGY-3: Most of the time is spent in the OR, except for a rotation lasting two to three months (depending on the number of residents each year) in the microsurgery lab.

PGY-4: Entire year is spent at the OR performing as first assistant to the main surgeon

PGY-5: "Elective year." Each resident is able to organize him/herself to spend the year in external rotations (national or international) according to each resident's interests.

Also, each year there is an option to apply for a two-month external rotation (national or international).

On average, how many hours a week do you work? How many nights are you on call?
On average we work around 100 hours a week (including regular work hours and call). In my current hospital we are on call q4.

Is there any required annual exam that you have to take in order to stay on the program?
Since all neurosurgery programs have to be accredited by a university there are annual exams that have to be taken in order to stay and advance within the program. At my hospital this exam is applied by the Universidad Nacional Autónoma de México (UNAM). Also, there is an internal annual exam given by the hospital.

Are you happy with your decision to pursue neurosurgery?
I am very happy with the decision I made. After looking into different options for my residency, both in Mexico and abroad, I decided to apply for my hospital and I am happy to say that it has exceeded my expectations, since I have a lot of opportunities both to study and learn with experts and also to perform a great number of surgeries under supervision thus acquiring excellent experience and knowledge.

Will you recommend neurosurgery training to others?
I would definitely recommend others to pursue a career in neurosurgery as long as they are convinced that it is what they want to do. Neurosurgery is one of the most demanding specialties, both mentally and physically, but it is also very rewarding. It comes with great responsibilities, since you deal with life changing decisions and procedures, and patients rely entirely on your knowledge, preparation, skills and ethics, so you have to be the best in the field to offer excellent results.