

# **AO Spine North America Community News**

## Winter 2020-2021





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# From the Editor

Dear Colleagues:

I hope this finds you doing well. 2020 has been a roller coaster of a year and I, like many of you, have been hoping that we would be able to return to some kind of normal by the end of the year. I remain optimistic that good things will be coming in 2021 and we will be able to connect “in-person” with each other again soon. Even with the setbacks caused by the pandemic, AO Spine North America continues to forge on by finding new ways to learn, do research, and connect with people.

In this issue, Tom Mroz talks about how the COVID-19 pandemic has shaped how people communicate including the fast-forwarded digitalization of medical education. Dan Sciubba reflects on his experience with utilizing augmented reality in spine surgery. Canadian surgeon and former AO Spine North America fellow, Raphaële Charest-Morin encourages more women to pursue careers in spine surgery. Our Spotlight section is on two of our current fellows who met in residency and are now completing their fellowship together at the Cleveland Clinic.

I also want to take a moment to wish everyone a Happy New Year! This is the time of year when many people take time to resolve to change aspects of themselves or their lives. Whatever it is you are focused on this year, may it bring you happiness and fulfillment.

Sincerely,

A handwritten signature in black ink that reads "Brandon Lawrence". The signature is written in a cursive, flowing style.

**Brandon Lawrence, MD**

Editor

# AO Spine North America Board and Committees



## AO Spine North America Board and Committees

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# Committee updates

## AO SNA Education Committee

Rick Bransford, MD

Happy holidays from the AO SNA Education Committee as we approach Thanksgiving, Hanukkah, Christmas, and New Year's. This is my first report as the AO SNA Education Chair now taking over from John DeVine as of July 1, 2020. I want to sincerely thank Dr. DeVine for his leadership over the past three+ years and for all that he has implemented. It has been easy to pick up from him, though I am sure none of us, particularly me, had anticipated the impact of COVID on the way we have managed education for the past decades. This has certainly been a learning experience for all of us. I also would like to welcome Michael Weber (McGill University, Montreal, Canada) and Elizabeth Yu (Ohio State University, Wexner Medical Center, Columbus, Ohio, USA) who have joined the Education Committee taking over from Michelle Clarke and David Gloystein. They are both outstanding individuals who have already been part of AO NA for a while and have proven themselves.

AO SNA Education has not had a live, in-person meeting, since February 2020. This is likely the longest gap without people seeing each other face-to-face in the history of AO SNA. We continue to cancel face-to-face meetings in exchange for virtual Zoom meetings/courses instead. Although we had some concerns with respect to this format, these have actually turned out to be relatively successful given the current state of affairs. We recently have completed a six week course for the fellows titled "That's Debatable" covering roughly eight to nine hours of discussion that was well received. We are currently in the process of trying to develop our first online resident principles course, to be held in November and December, spearheaded by Michelle Clarke, Ali Baaj and Joshua Herzog.

John France has recently started having an online course every other Monday with case consultations. There are three faculty involved during these courses and the goal is to involve fellows who have been out in practice for approximately zero to five years presenting cases for discussion. To date, this has been very successful and quite interactive.

The first "advanced course" on complications that was held for the first time in December 2019 in San Diego was due to re-occur in Jacksonville, Florida in October 2020. Unfortunately, but not unexpectedly, that course was canceled and it has been postponed until the fall of 2021 to be held November 19-20 in New Orleans. This will continue in the previous format of "complicated case" presentations with either litigation or potential litigation with discussion of these cases.

Our goal at this point is to return to live events in the second half of 2021. Obviously, this will be dependent on the state of COVID in North America. We anticipate having five face-to-face resident courses through the latter part of 2021 to try and make up for lost time and courses. The Banff Fellows' Forum has been held annually in March or April for the past 18 years but will be held virtually in May 2021.

**We are doing the best we can in this COVID epidemic. Please do not hesitate to share any ideas, thoughts, or recommendations in this changing realm of education. Feel free to email me at [rbransfo@uw.edu](mailto:rbransfo@uw.edu)**

## AO SNA Research Committee

Daniel Sciubba, MD

2020 has been a challenging year for all of us. For those who have been able to remain healthy and financially solvent, please remember to be grateful for your fortunes and look to help those less fortunate. For those who have been severely and directly affected, please know that you are not alone, and we at AO SNA are part of your professional family to help in any way possible.

Despite the challenges of the pandemic, the world has quickly and drastically pivoted to an even more virtual world. Video conferences, video meetings, and telehealth are now the norm for many of us. The AO SNA Research committee has similarly adopted new skills. We thus have been able to efficiently and routinely accomplish research-related tasks from the safety of our own offices or homes. With regard to supported studies, we have continued to enroll and follow patients for both the riluzole myelopathy and isthmus spondylolisthesis prospective studies under the leadership of Michael Fehlings and Paul Arnold, respectively. We expect to complete both of these studies within the year and anxiously await analysis and publication when done.

The research committee has worked to create current and future avenues of scholarship for its members. First, the team of Zohar Ghogawala, Shekar Kurpad, Zorica Buser, Jeff Wilson and Jim Harrop have led a Global Spine Journal Supplement edition on cost of spine care and predictive analytics/clinical calculators. These papers have been written by various members of AO, and they will be published within the next several weeks. The manuscripts will highlight the immediately relevant issues of how to provide/determine value in light of increasing costs of spine care. Once completed, we will immediately begin on the next supplement. Any ideas from our membership would be appreciated, but we are currently considering topics such as: robotics in spine, augmented reality, and new technologies in fusion.

In addition to the scholarship cited above, the committee is working to make all datasets from previous AO studies more available to its members. In this way, new creative ideas and questions can be applied to previously accrued patient data. We hope that such access will allow for deeper and broader research endeavors within AO. Finally, a more robust virtual presence has allowed us to more actively work with our international AO colleagues. Under the leadership of Dino Samartzis, the various AO research regions (e.g., North America, Latin America, Europe, Pacific, Middle East, etc.) have collaborated on many projects. Recently, our groups have published several papers looking at worldwide spine surgeon responses to the pandemic regarding clinical practice, adoption of telehealth and physical health of surgeons themselves. We anticipate that such collaboration of AO Spine research across these regions will only increase in the coming year.

**In closing, the AO SNA Research Committee plans to continue all of its plans as outlined before the pandemic. In fact, we believe that the increasingly virtual nature of the world will support greater collaboration as individual researchers and surgeons can interact and contribute valuable research from the safety of their homes and offices. Please feel free to reach out to me or any members of AO SNA research committee to add to these amazing efforts. Please also remember to protect yourselves and those around you.**

# Committee updates

## AO SNA Fellowship Committee

Eric Klineberg, MD

This fellowship cycle continues to be challenging due to the COVID pandemic, and social distancing.

The Fellows Webinar series has been successful again this year. We had the Fellows Kick-off Webinar of the 2020/21 academic year on September 1, 2020 and have scheduled educational webinars for the fellows for the remainder of the '20/21 academic year.

We have expanded our virtual activities, transitioned the Fall Fellowship course to online. Rick Bransford and Ryan Spiker transitioned the traditionally in-person course to virtual "That's Debatable" webinar series that occurred every evening for the month of October. We have considered renaming October "AO Fellows Month". Topics ranged from trauma and degenerative to adult deformity. The courses were well-attended by faculty and fellows and led to lively online discussion and participation.

The committee has converted the application process to an online system as well. Together we have developed a rigorous evaluation process for fellowship selection to award both fully funded fellowships as well as unfunded sites. The application process will be closing soon, and then that's when the real work begins. We will be spending many hours of work carefully reviewing the many applications that we will receive. Although difficult decisions will need to be made due to the many excellent programs applying, I feel confident that we can select the most deserving programs. We wish all applying programs good luck throughout this process.

**The Fellowship Committee continues to look for opportunities for current and former fellows to get together at national meetings to foster the sense of fellowship in community that is so crucial to AO Spine.**

## AO SNA Community Development Committee

Brandon Lawrence, MD

**Greetings from the Community Development Committee as we continue to navigate these challenging times. We at AO Spine North America hope that everyone is staying safe and healthy during these unprecedented times! Some of the exciting projects that we are working on in the CDC continue to be the quarterly release of our curated articles that has been commissioned internationally, most recently by Latin America. We are also continuing to develop an innovative podcast series. Please be sure to visit our [website](#) to see some of these projects roll out over the next several months.**

In addition to these initiatives there is also refreshing update to our social media efforts. We feel these will allow for some very interesting and novel ways to engage our members with online content, sharing of cases and updates on courses being offered, both past and present.

The next event that we are looking forward to is the GSC in Paris this spring (COVID-19 permitting) that will engage all members with a hybrid of in-person and virtual options so stay tuned and register for the GSC for incredible international engagement of our AO Spine community. We hope to see as many of you there, or virtually, as possible!

As we move into 2021, we at AO Spine North America are hopeful that we can continue to remain progressive with our patient care, education, teaching, and health efforts. Many members want to contribute and there are lots of ways to do it. Members have opportunities to get involved in education, research, marketing and promotion, fellowship outreach and professional growth.

**For those interested in becoming more involved, email Chi Lam at [lam.chi@aona.org](mailto:lam.chi@aona.org).**

### AO SPINE ONLINE

We continue to have a strong and growing social media presence: Facebook, Twitter, and Instagram. Make sure you visit and follow us!

 [facebook.com/AOSpineNA](https://facebook.com/AOSpineNA)

 [@AOSpineNA](https://twitter.com/AOSpineNA)

 [AOSpine](https://in.linkedin.com/company/AOSpine)

 [AOSpine\\_NA](https://www.instagram.com/AOSpine_NA)

# The role of the spine surgeon in medical education

## Education will never be the same again.

We are witnessing a remarkable change in both teaching and learning experiences. The COVID-19 pandemic has shaped all forms of human communication and fast-forwarded digitalization in education—medical education is no exception. AO Spine recently conducted a study on COVID-19 and the current and future challenges in spine care and education (\*). For reflections from an educator's perspective, we talked with Dr. Thomas E. Mroz about the role of the spine surgeon in medical education.

In the AO Spine survey, over 80% of respondents said they were interested in continued use of novel learning modalities. If a centralized web-based collaboration platform were established, 33.9% said they would be active readers and 59.8% would both read and contribute. But when asked if they would attend a scheduled medical conference from March–April 2021, already then 33.7% reported being either unsure or not likely to attend.

The research gathered views from 902 spine surgeons around the world. The results testify to the rapid change and adoption of the new medical education landscape.

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“The pandemic accelerated the adoption of digital platforms.”

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Amidst the uncertainty, Thomas Mroz sees a silver lining in the fast digitalization of medical education. “The pandemic accelerated the adoption of digital platforms. The technologies existed already before, but the adoption in medical education lagged. The situation forced medical education to evolve and to maintain our ability to educate fellows, spine surgeons, and practitioners around the world,” Mroz summarizes.

Although the outreach with digital channels is wide, Mroz is concerned about opportunities for interaction. “A very important part of learning, the different face-to-face settings where we can actively share ideas over microphone or across a table, is decreasing now. We all have attended conference calls or e-meetings with lectures on various platforms. These are not environments where it is easy to ask questions.”

85.2% of respondents of the AO Spine COVID-19 study with residents and fellows, reported that the pandemic has hurt their overall experience. Mroz stresses the importance of fellowships as well in the current environment. “I don't think the pandemic has in any way, shape, or form diminished the importance of fellowships. A fellowship is an important stage in a surgeon's career, in the educational and training processes, where one moves from residency into a fellowship and really owns the skillset.”

## Peer learning more popular than ever

Peer-to-peer learning has taken many new forms with digitalization, and while there are many advantages, Mroz also sees a strong need for an anchor. “This means someone must keep challenging individuals to become better, regardless of the level they're at. Sharing



ideas with peers is a robust platform for growth, but you also need to challenge peers in a discussion or conversation to do the same.”

Mroz reminds us that having an objective and validated data source for driving the peer-to-peer learning or exercise is an absolute must. “When talking about peer learning, I think it is important to understand the part of the conversation on standards and guidelines in spine surgery. They are the pillars of how we practice as a spine community. It does not mean that we should not share ideas beyond existing standards or guidelines and question them.

Can we do things better? Can we adopt new technologies? Or can we use machine learning, as an example, to change how we approach spine care?

I fully support and recognize the importance of peer learning, but it must be anchored to what the acceptable standards are,” Mroz concludes.

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“I fully support and recognize the importance of peer learning, but it must be anchored to what the acceptable standards are.”

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Online assignments have become one of the most common forms of peer-to-peer learning. What are the cons of online peer learning—is there a possibility for spreading false information? “The freedom to exchange ideas is paramount and incredibly important.

Oftentimes, the threat with digital platforms is simply this: anybody can say whatever they want and the recipient of the knowledge or information might think: wow, this person has a million followers, it must have merit, it must be true!



Thomas Mroz co-edited the AO Spine Textbook 2020 with Michael Steinmetz and Jeffrey Wang. The Textbook is a comprehensive overview on surgical management of the spine and aims to improve spine surgery education throughout the world.

(\*\*) Steinmetz MP, Mroz TE, Wang JC. AO Spine Textbook: Comprehensive Overview on Surgical Management of the Spine: Jaypee Brothers, Medical Publishers Pvt. Limited; (736 pages) 2020.

That is a real threat, because not everything propagated on digital and social platforms is necessarily true. It may not be the right thing to do for patient care, it's just somebody's idea."

Like most of us, Mroz also follows influencers online, many of whom are real thought leaders. "The majority of their approaches, I totally get and agree with. But then I come across other things that—from where I sit—don't make a lot of sense and are not in the best interest of the spine community. So, the question of the hour is, what mechanism could there be, not to censor, but to fact-check the content of online discourse in the context of medical education? I don't have the answer, but I want to make sure that there is no negative influence on how a patient is treated, regardless of who that patient is."

### The role of a mentor remains the same

There are already certain differences visible in fellowships of pre-COVID times and now. Mroz points out that already before COVID, a lot of our networking happened online and digitally, but it was always enhanced by face-to-face interactions and society meetings. "Now, the face-to-face-part has almost completely gone away. Thus, fellowships, mentors, fellowship directors, and the staff at the institutions have become even more paramount to one's career path."

Networking has always been a big advantage of being part of the AO Spine community, and Mroz is happy to see AO Spine opening new platforms for discussion. "Being a part of AO Spine has been incredibly important for me. Year after year at our annual meetings and through the variety of digital platforms, there has been just an amazing amount of conversations between fellows from different programs. When you have that kind of freedom to share ideas, it engenders a healthier conversation about spine care. For fellowships within the AO Spine community, it provides for unprecedented networking."

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"Networking has always been a big advantage of being part of the AO Spine community."

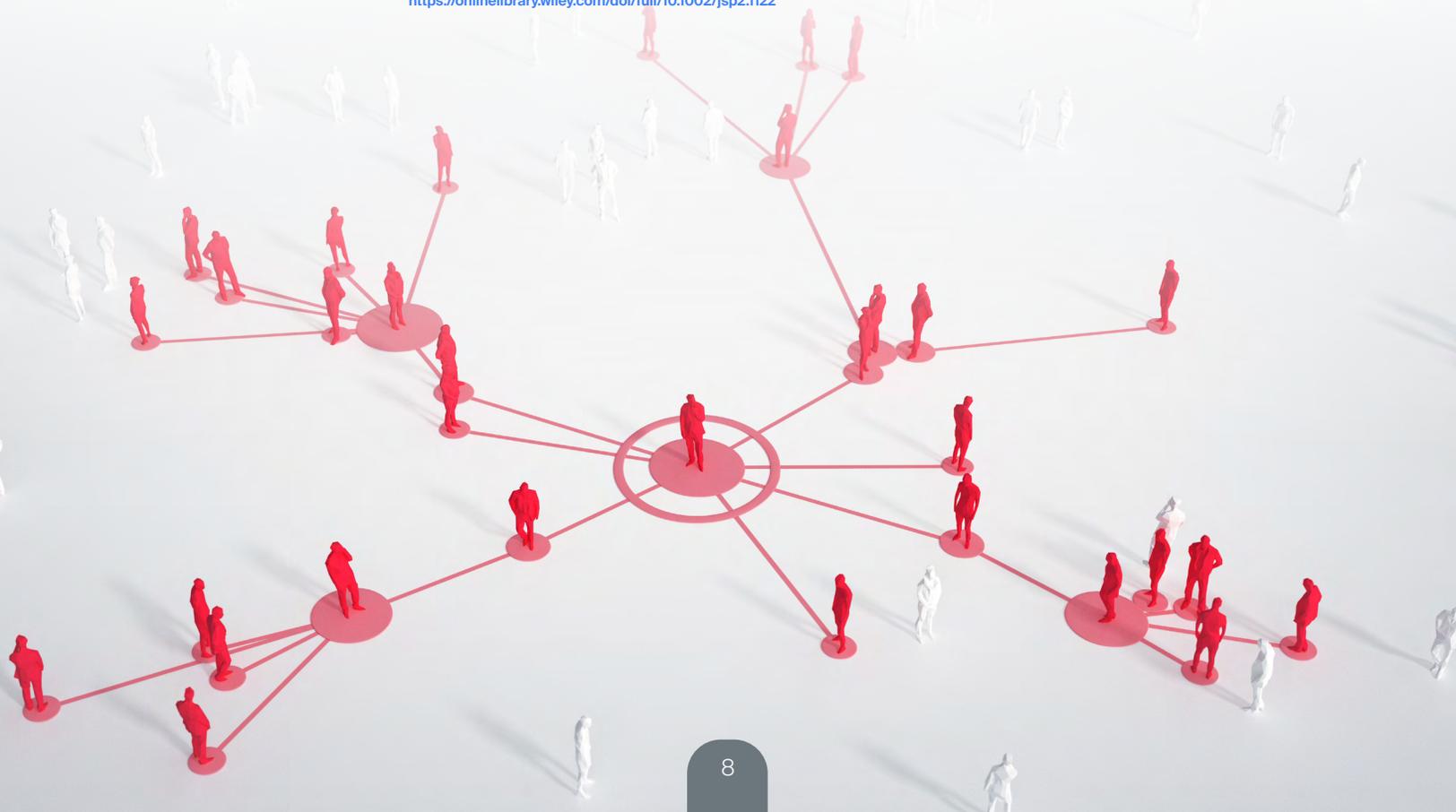
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Mroz continues, the role of a mentor cannot be overstated. "My mentor was Dr. Jeff Wang, and if one is as lucky as I was to come across a mentor like him—selfless and interested in your professional development—the value of the experience cannot be overstated. Training with Jeff Wang was the best decision of my professional life.

"I always recommend that people who are interviewing for a fellowship really look into the mentor. Our goals are different: some want to go into private practice, others into an academic setting at a tertiary care center. The requirements and expectations from the mentor are also going to be different. A good mentor can enhance and propel your career to a trajectory that not every program can."

(\*) Nolte MT, Harada GK, Louie PK, McCarthy MH, Sayari AJ, Mallow GM, Siyaji Z, Gernscheid N, Cheung JP, Neva MH, El-Sharkawi M, Valacco M, Sciubba DM, Chutkan NB, An HS, Samartzis D. COVID-19: Current and future challenges in spine care and education - a worldwide study. JOR SPINE: (e1122).

<https://onlinelibrary.wiley.com/doi/full/10.1002/jsp2.1122>



# When augmented reality became reality—the vanguard spirit of Daniel Sciubba



**“We are living in one of the most exciting times in the history of surgery and medicine,” says Daniel Sciubba, who with his team accomplished the world’s first augmented reality (AR)-supported spine surgeries earlier this year.**

“What inspires me most is innovation.” The answer comes without a blink of an eye when Sciubba talks about inspiration. “Whether it happens with surgery, research, teaching, or raising children—seeing things that can be done better than they are being done now.”

Here, Sciubba dives with AO Spine deep into AR and into the future of spine surgery.

## **How has AO Spine influenced your career?**

AO has been part of my career journey for decades. I first joined as a resident and was extremely impressed by not only the world-class people that were involved, but the fact that they wanted to connect with the participants. I became a fellow in AO Spine and received the Young Researcher Grant as young faculty. Currently, I lead the AO Spine North America Research Committee.

I owe a great deal to AO for my career: it’s a large part of how I think, how I approach problems, and I look forward to seeing those colleagues regularly because I do consider AO a professional family for me.

AO serves many roles in the world currently. When people think of AO, they really think of it as an institution: where to get an unbiased, evidence-based, world-class education in orthopedics, neurosurgery, and various other disciplines. Beyond that, AO has now become a vanguard, a leader in research, as well as innovations.

## **Moving on to the hot topic of augmented reality and spine surgery: Can you tell us about the idea to develop an AR system platform for spine surgery?**

Some years ago, I had the opportunity to become involved in the development of AR for spine surgery. This was extremely inspiring. The question was, to put it simply, how to combine the natural operating that we do every day by looking at a patient with the benefits of navigation in a less bulky way?

Augmented reality is different than virtual reality. Virtual reality is if you closed your eyes and you were surrounded by a completely new environment. You don’t see the world around you; you see an environment someone created.

Augmented reality is different: you see the world around you but with things added to it in a specific time and space. So, if you would be driving and looking down the street and had to turn left, an arrow would appear on the street, maybe on the ground to guide you. Imagine seeing the sign on the street and not on your car’s navigation screen—that would be augmented reality. Our idea was to find out if we can create such for spine surgery.

## **In what kind of surgery was the AR system used and why was this specific surgery chosen?**

The first surgery was an open lumbar fusion case. We wanted to show a case that went smoothly from beginning to end. We knew that whether or not the augmented reality provided us with what we thought it could, the surgery would go fine.

The second surgery was much more advanced. We used *en bloc* resection for chordoma, in which we not only used the navigation to place screws, but also the navigation to plan our osteotomies around the tumor to be as accurate and safe as possible, getting the tumor out with good oncological margins, but minimizing the damage to the local tissues.

One can see from the very first case, which was an open lumbar fusion, to the more advanced tumor and MIS operations, that the platform is extremely robust, and I think has saved us time and energy. It is adding value to these very challenging cases.

## **How was the patient chosen? Did it require any special arrangements?**

The augmented reality system went through the FDA clearance and was based on a predicate of prior navigation. In light of talking to patients about AR, we’ve used that same protocol. In other words, we’ve told patients, “We use the navigation at times in the operating room, and this is no different.” But we still wanted to educate them that this was a new technology when we first used it.

The patients that we chose were extremely excited about the opportunity to be involved and saw that this may benefit their surgery. Secondly, they knew, as we told them, that if the technology did not work, it would not affect their outcome in any way.

I think this is in part of the partnership we had, not only with the government but also with the patients themselves to make this happen. Everyone has been on the same page with the partnership to innovate.

The actual AR system platform consists of the following:

- **A wireless headset**—Think of the headset as the wand or probe used in navigation, by just wearing the headset which is basically like wearing a headlight.
- **A wireless foot pedal**—This is for changing the view of what you want to see on your augmented display. If you want to see nothing, just look through the headset, and you will see the patient as you normally see them. If you hit a button of the pedal, configure it differently, you can add in different components like sagittal navigation, axial navigation, et cetera, or you can have a completely topographic 3D reconstruction of the spine overlaid over the spine in the operating room.
- **The patient reference frame** is a clamp placed on a patient's spine. The clamp is already placed when the person comes into the operation room.
- **There is no camera needed outside** like in other navigation. The cameras and the navigation points are inside the headset.
- **You can quickly and easily turn the AR on and off** or layer in the amount of augmented reality that you would like to add to your augmented world while operating. It can picture where your head is in space so that as you move your head around looking at the patient, you can see through the augmented reality the spine or at least the 3D reconstructions of the spine in real-time.

#### Was there any backup used during the surgery?

In the first few patients, we did use backup. We had prepared without the presence of augmented reality to do that surgery without any navigation. In other words, we placed screws freehand and

corroborated the placement of our hardware using intraoperative imaging, with x-rays or even intraoperative CT scans.

Without the AR platform, it would have been business as usual. So, as a backup, we had our normal standard. We felt very confident that, if there were any problems with the system, the patient would be protected, because we would revert to the normal safe operations that we have been doing for decades.

#### How would you describe the user experience of the augmented reality system?

For me, it has all the positives with none of the negatives of navigation. I must admit that I have not used navigation in a large part of my practice over the last several years. I think navigation provides the potential for increased accuracy and possibly for increased speed and efficiency in the operating room.

I have never enjoyed having to—myself or my colleagues who help me operate—turn away from the patient's spine to look at a monitor. This is especially concerning when the spinal cord is exposed, or when other significant structures are exposed.

For someone who shares that feeling, the AR platform might be impressive to try. For people who have not embraced navigation, like me, this is quite a natural technology to use.

For people who like navigation and have embraced it fully in their practice, the AR system provides a faster and easier form of navigation. The AR system does not involve a camera that can be blocked by arms or drapes or has to be moved around. And it doesn't require the extra looking into a monitor. The image is really projected right onto your retina.



Finally, for those of you who are really good at placing hardware, this will only make you better. You have the same tools you always used with an added benefit of navigation. And those surgeons who are novices at placing screws and manipulating the spine, this will bring them to an advanced level.

So, in short, the AR system is very impactful—it will bring novices to expert levels, and it will bring experts to even higher levels.

### **What were the most important advantages that AR provided in this operation?**

Navigation has the advantage, potentially, of making the surgery more accurate because it is based on very specific advanced imaging that surgeons might not have access to if they do things freehand.

On the other hand, if surgeons operate the way they normally do and are looking at the patient and not a panel or a screen like is classically done in navigated procedures, surgeons feel more comfortable, and surgery should be therefore safer and more efficient.

I've often felt these two were at odds. If one operates in a naturally comfortable environment without having a monitor or a camera or even a robot between them, the surgery would be ideal in a way, but we might miss out on the benefits of navigation. On the other hand, if someone uses navigation, they may get the benefits of that extra accuracy, but at the expense of a bulky system that might be more inefficient.

If we can combine these two in this new augmented reality platform, we have the best of both worlds. That means a more efficient operation, potentially a faster operation, more accurate use of implants and tools, which in theory means a safer, better outcome for the patient.

### **How do you think AR will shape the future of spine surgeons' work?**

The basic thing that it will give is an easier, faster, and more accurate operation in a way that's simpler and more intuitive than all the previous navigation systems to date.

It's going to be much more natural for a surgeon to be looking at the patient rather than a monitor when navigating. It is going to be much more natural for the surgeon to put their hands on the patient, rather than having a robot in between.

There are so many times in the operating room where we don't see what we want to see and we have to assume, or we have to use our judgment. For example, making maneuvers around structures that are too delicate because we can't see around them, or manipulating things without actually seeing through all the bone, the vessels, or the spinal canal, and knowing where our instrument is and where it's going to be.

If we can see those things, we can be less invasive. If we can be less invasive, we can do surgeries that we've never done before in a minimally invasive manner. AR is going to become more robust and more refined; we are going to be able to see things and do things that we found too difficult to do in the past.

### **What new technologies do you think could be launched in the next few years?**

There will be some novel innovations that we've not thought of but which will have an even greater impact combining technology that we already have.

Currently, predictive analytics means taking pictures of patients in the clinic or the operating room and running a series of analyses to try to figure out angles, failures, complications, and outcomes in a way that the average human cannot compute. So, rather than augmented

reality just showing me pictures and navigating, it's giving me guidance or judgment about what I should be doing when I'm looking at the incision. AR is giving me red flags of areas to avoid. It's giving me green target areas that I should address by showing opportunity based on big data and machine learning data.

I can imagine a time in the future where the benefits of robotics combined with augmented reality and predictive analytics will revolutionize the way that the surgeries are done. Surgeons may not be interacting with patients in the operating room as they used to in a very old-fashioned way, but will be using real-time input from machines, from computer analysis, and from improved imaging to give us insight on the best way a surgery should be done in real-time.

But even more inspirational and aspirational is that you should look for what you can provide as you see different technologies working together.

It is through our combined experience that we can innovate together, something that the AO has laid its foundation on for decades. If we continue trying new things together, look at them critically, and continue to advance, we're helping each other, our fellow man, and all of our patients simultaneously.



### **Daniel Sciubba—Summary of CV**

Dr. Daniel Michael Sciubba is Professor of neurological surgery, oncology, and orthopaedic surgery at the Johns Hopkins University School of Medicine. He serves as Director of spine tumor and spinal deformity research in the Department of Neurosurgery.

Sciubba specializes in the surgical treatment of complex spinal conditions including tumors, degenerative spine diseases, spinal deformities, and scoliosis, employing minimally invasive techniques when possible. He looks to create and capitalize on innovative opportunities at the crossroads of healthcare, medical sciences, and business.

His goal is to make transformative improvements to the current care paradigms for such challenging conditions while still treating patients with precise individualized care.

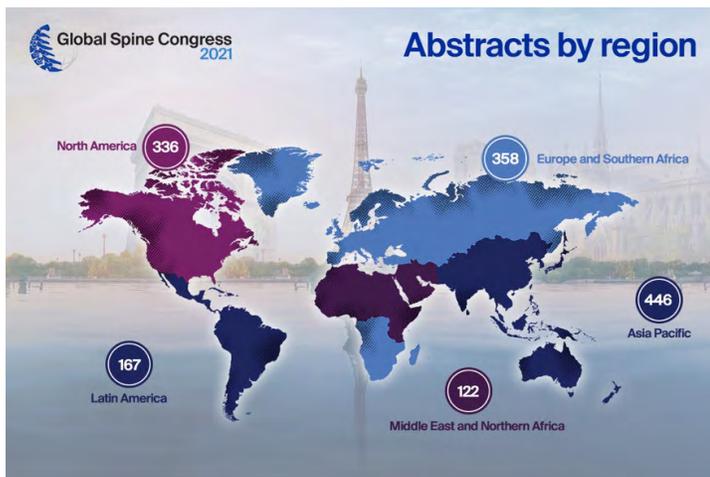
Sciubba is the AO Spine North America Research Committee Chairperson, and a valued member of the AO Spine Knowledge Forum Tumor participating in several AO Spine studies.

# Global Spine Congress 2021: The Abstract Results are in

The abstract numbers are in for the Global Spine Congress (GSC) 2021, AO Spine's annual meeting and one of the largest spine gatherings in 2021. We are excited to announce that we have received a total of 1,429 abstracts which were submitted in over 25 categories from Spine professionals in 69 countries.

This number has exceeded our expectations given the current global pandemic. As the GSC has moved to a hybrid event, the call for abstracts was open for a shorter time period, yet the submission rate was higher than in previous years. In addition, this is the highest number of abstracts submitted for a GSC taking place in Europe, surpassing GSC 2017 in Milan by nearly 400 abstracts.

See below how each region of the world contributed to the total number of abstract submissions, and which abstract topics are the most popular.



## Be part of the conversation and register early

The GSC is heading to **Paris, France** from **May 5–8, 2021** and will be a hybrid event for the first time. Participants can experience the congress in person from the venue in Paris, or virtually, with our exclusive online platform, anywhere around the world. GSC will combine our traditional meeting with a live, online presence, bringing our Spine community even closer. Both options will provide participants exclusive networking opportunities and access to all our scientific sessions.

It's never too early to start planning—register to take advantage of our early bird savings which ends December 21. The GSC and its new meeting format is a great venue to network with spine professionals from around the world, explore career development opportunities, and gain access to the world's best research and clinical experts.

Additional discounts also apply for medical or research students, residents, fellows and participants from low-income countries. Not an AO Spine member? [Sign up](#) for membership today.

[Visit the registration page](#) on our official GSC website for more information.



Global Spine Congress 2021

**Paris, France**  
May 5–8, 2021

GSC 2021 goes **hybrid!**

**REGISTER NOW!**  
EARLY BIRD DISCOUNT ENDS DECEMBER 21

# Fall Updates— *Global Spine Journal*

*Global Spine Journal* is having its most successful year yet, with a record number of submissions thus far and greatly surpassing last year's counts.

We would like to thank our authors for their continued support during COVID-19 and we also thank our reviewers for their tireless efforts during a very difficult time and when there is a reviewer shortage.

We would like to recognize some of the top articles of the year so far:

## Most Cited Regular Issue Articles:

1. [Degenerative Lumbar Spine Disease Estimating Global Incidence and Worldwide Volume](#)
2. [Incidence of Osteoporosis-Related Complications Following Posterior Lumbar Fusion](#)
3. [The Role of Prognostic Scoring Systems in Assessing Surgical Candidacy for Patients With Vertebral Metastasis: A Narrative Review](#)

## Most Cited Special Issue Articles:

1. [Essential Concepts for the Management of Metastatic Spine Disease: What the Surgeon Should Know and Practice](#)
2. [Treatment of Odontoid Fractures: Recommendations of the Spine Section of the German Society for Orthopaedics and Trauma \(DGOU\)](#)
3. [RE-CODE DCM \(Research Objectives and Common Data Elements for Degenerative Cervical Myelopathy\): A Consensus Process to Improve Research Efficiency in DCM, Through Establishment of a Standardized Dataset for Clinical Research and the Definition of the Research Priorities](#)
4. [Surgical Site Infection in Spine Surgery: Who Is at Risk?](#)

## Top Downloaded Regular Issue Articles:

1. [Does Size Matter? An Analysis of the Effect of Lumbar Disc Herniation Size on the Success of Nonoperative Treatment](#)
2. [Overlapping, Masquerading, and Causative Cervical Spine and Shoulder Pathology: A Systematic Review](#)
3. [The Impact of COVID-19 Pandemic on Spine Surgeons Worldwide](#)

## Top Downloaded Special Issue Articles:

1. [Classification of Osteoporotic Thoracolumbar Spine Fractures: Recommendations of the Spine Section of the German Society for Orthopaedics and Trauma \(DGOU\)](#)
2. [Essential Concepts for the Management of Metastatic Spine Disease: What the Surgeon Should Know and Practice](#)
3. [Spinal Tuberculosis: Current Concepts](#)



## Don't forget to also check out our 2020 Special Issues:

### The 6 T's of Minimally Invasive Spine Surgery: Target, Technology, Technique, Training, Testing, and Talent

Top Articles from this issue:

1. [Evolving Navigation, Robotics, and Augmented Reality in Minimally Invasive Spine Surgery](#)
2. [Indirect Decompression Failure After Lateral Lumbar Interbody Fusion—Reported Failures and Predictive Factors Systematic Review](#)

### Quality Improvement and Spine Surgery

Top articles from this issue to read:

1. [Anticoagulation and Spine Surgery](#)
2. [The Use of Intraoperative Neurophysiological Monitoring in Spine Surgery](#)

If you are interested in reading more GSJ special issues, please go [here](#).

Please also check out our **special collections** featuring articles grouped by topic.

## We also have these special collections highlighted for the month:

1. [Editor's Choice Articles](#)
2. [EBSJ Systematic Reviews](#)
3. [COVID-19](#)

GSJ also has a journal club group in the new **myAO** platform. This is a group where editors, authors, reviewers, readers, and any AO Spine members can discuss and exchange knowledge about the journal in an open forum that is a safe and private space. We encourage all of you to join the group and participate in the discussions. The group link can be found [here](#).

# A marathon, not a sprint



Raphaële Charest-Morin, MD, FRCSC

**Acclaimed Canadian orthopedic surgeon, former AO Spine North America Fellow, and AO Spine Knowledge Forum (KF) Tumor associate member Raphaële Charest-Morin, MD, FRCSC, enthusiastically encourages women to pursue careers in spine surgery and spine research. She says these careers are “a marathon, not a sprint” and asserts that a strong drive—and a strong support network, including mentors—is essential.**

For the past two years, I have practiced spine surgery at the Vancouver Spine Surgery Institute, a highly specialized organization in Vancouver, Canada. Previously, I was in Quebec City, Canada, for three years. I have wanted to be a surgeon for as long as I can remember. My dad was a donor to Doctors Without Borders and from an early age I was fascinated by surgery. I wanted to help people.

My involvement with AO Spine started with my AO Spine North America Fellowship at Vancouver General Hospital in 2014–2015. One of my mentors was Dr. Charles Fisher, who is the Chairperson of the AO Spine KF Tumor, and he integrated me into the Knowledge Forum.

AO Spine is a useful network in terms of all of the people I can engage in discussion about complex cases. It's a very collegial environment. It's easy to reach out to people all over the world, and that's really a strength of this KF.

I know that there are women surgeons and researchers who have faced a lot of challenges, but I have been very lucky as I feel that throughout my education and career, people have encouraged and helped me. I never felt I was treated differently because I was a woman.

It might be hard for some people to reconcile this career with having a family, but if you have great family and social support, you can have

both family and a career as a spine surgeon. I have two children, eight and four years old, and I have a really helpful partner. I know from personal experience that it can be done. In fact, I had one of my children during my residency, which is one of the craziest, busiest times in any surgeon's life.

I'm in a great group of surgeons, including young fellows and residents who are here to learn. They push us forward. The role of mentor is an important one: I have had excellent mentors and by being a mentor, I can pass this support on to the next generation. I believe that by being a role model, I am encouraging women to find their own places in spine surgery. Whether a young woman is considering a career in research or a career in surgery: understand that you will have to make some sacrifices, but work hard, and don't be afraid to ask for help. Give yourself objectives and stick to them. It will pay off. It's a marathon, not a sprint. You'll get there.

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“We do need more women who are working as spine surgeons to inspire the next generation. There are not a lot of women spine surgeons, but there's a lot of opportunity. Every year when I go to conferences, I'm approached by residents wanting to do spine surgery or spine research.”

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# AO Spine NA Fellows Course: “That’s Debatable”



The COVID-19 pandemic required us to think about engaging our learners in ways outside of our traditional face-to-face events. Many of the AO NA offerings were delivered online and the annual fall Fellows Course with the supplemental Practice Essentials component was no exception. Leading this effort were Co-Chairs, Rick Bransford and Ryan Spiker. The “That’s Debatable” Series featured six modules of asynchronous self-study material and 90 minutes of synchronous live sessions. The six modules included Cervical Trauma, Cervical Radiculopathy, Cervical Spondylolytic Myelopathy, Thoracolumbar Trauma, Lumbar Spinal Stenosis and Attaining Global Spinal Alignment.

The asynchronous self-study material was delivered to learners through Totara, the AO NA Learning Management System (LMS). Participants were to complete the self-study material prior to attending the synchronous live session.

The synchronous live sessions featured panelists discussing cases in a debate-like format that allowed for the exploration and analysis of controversies in management and treatment options. The online self-study materials provided prior to the synchronous sessions helped learners prepare for such a discussion. Archived versions of the synchronous sessions are available to all learners including those that were not able to participate.

The Practice Essentials component of the Fellows Course, led by Lali Sekhon, will be presented in four consecutive Thursday evening sessions starting on January 7, 2021 from 8:00–9:30 PM EST.

These sessions cover several non-clinical topics important for fellows transitioning into practice.

According to Ron Costello, AO North America’s Digital Learning Manager:

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“The Spine Fellows Course was in many ways the ‘maiden voyage’ for Totara, AO North America’s new learning management system (LMS). The Totara LMS is based on Moodle open source code, used in many colleges and universities around the country. Totara provides us with the opportunity to customize the end user experience.

Specific dashboards and learning hubs that are set up according to experience level and clinical division allow peer groups to share and exchange ideas, perspective and thoughts on topics that are important to them. The Spine Fellows Course also allowed us to pilot Totara as our ‘One Stop Shop’ for online learning in AO NA. Additionally, Totara provided a forum where learners could give the faculty feedback from the sessions or ask questions; in turn faculty were able to respond to questions, thus creating a dialogue with the participants.

In addition, flexibility of accessing content and reviewing it again at a later time was made possible. We want to provide both our faculty and learners with a robust system that meets their needs, is device agnostic and can be accessible any time, anywhere.”

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## Fellowship Opening

Penn Medicine at the University of Pennsylvania has a 5-month adult spine reconstruction fellowship opportunity from **February to August 2021**.

The fellowship is heavily weighted on adult scoliosis and complex spines.

The opportunity is open to neurosurgery or Orthopedic residents from a North American residency program.

Interested candidates should contact Dr. Amrit Khalsa at [akhalsa1@gmail.com](mailto:akhalsa1@gmail.com).

# Fellows Spotlight: Christina & James Wright

**Christina & James Wright met in residency at Case Western Reserve University, got married, and are now completing their fellowship together at the Cleveland Clinic. We interviewed Christina and James Wright on how they balance each other both at home and work.**

## **Please tell us about yourselves.**

**Christina:** “I grew up in Washington, DC, in a pretty close-knit family and spent most of my youth and college years playing competitive soccer. Before med school, I spent a year traveling and working in Southeast Asia which was a formative experience for my perception of healthcare, neurosurgery, and now the delivery of spine care. In my spare time I enjoy running, yoga, cooking, soccer, armchair activism, and hanging with our two-year-old son and our two pitbulls.”

**James:** “My background is of a pretty typical middle-class upbringing in Georgia. I wasn’t one of the lucky ones that always knew I’d be a doctor and thought I would end up in a career in business. I gravitated more towards the sciences in undergraduate and just never got away from it and kept going. I’m a huge sports fan, enjoy international travel, the outdoors, and spending as much time with my family as I can.”

## **Why did you decide to go into spine?**

**Christina:** “For me, spine was the perfect mix of biomechanics, procedural diversity, and functional restoration. I also think that it is a field with great potential to do as much harm as we do good. So to me, spine is one of the most challenging fields because not much is very straightforward. I think there are huge knowledge gaps in the field that warrant exploration and I’m excited to engage with less commonly explored topics such as spine psychology, alternative medicine, and creative ways to improve quality measures in spine surgery.”

**James:** “Between the first and second years of medical school I was lucky enough to be accepted to complete a summer internship on the general surgical trauma service. I had an interest in trauma early on but wasn’t sure at that point exactly what I wanted to do. An experience with a patient during that internship left a lasting impact. I was involved in the care of a young man who presented after an ATV rollover with a cervical fracture-dislocation, spinal shock, and tetraplegia. I was drawn in by the complex multidisciplinary management required to get this kid, not much younger than I was at the time, and his family, through this horrible experience. I found the prospect of being involved in all aspects of a patient’s care from the emergency surgery required at the time he presented, complicated postoperative critical care of spinal cord injury, to the long-term relationship built with these patients and families very difficult but rewarding. I’m maybe a little atypical for a spine surgeon in that I’m also board eligible in neurocritical care, but those were the types of patients that drove me to this career.”

## **It is really unique that you are married to each other and completing your fellowship at the Cleveland Clinic. What is that like? Are there any advantages or disadvantages to being in the same fellowship program at the same time?**

**Christina:** “We were in the same residency program for six years so to us it’s not that different. I transferred to UH / Case Western my PGY2 year from California. Perhaps to others it may seem a little bit unusual but in general I think it’s been advantageous. Given we’ve been in Cleveland for six years and have a core group of co-residents that we consider family still here, it was both a convenient and awesome opportunity to complete a fellowship just down the street. But our personalities are very different and we have our own individual ways of operating and working with people. It’s great to have James as a sounding board and from each faculty we work with we share the different tips and techniques we learn with one another. As a team we like to think we function in a synergistic manner with regard to collaboration, research, building a community. We operate together on occasion which is always fun but we have to pre-emptively decide who is the lead to avoid any domestic disputes across the operating table!”

**James:** “I think there are some pros and cons, as with anything, but on the whole we both have benefited tremendously by being together through residency and now fellowship. We don’t ever have any disagreements about scheduling or unrealistic expectations for how many nights a week we might be able to have dinner as a family. We very much understand the complexity of our lives, that things are going to be unpredictable, and that emergencies happen. It probably is a bit of an advantage for us to be able to talk about what birthday presents we’ll get for our son one minute and then bounce ideas for what the other might do for a complex spinal trauma the next. We certainly have strength in number. The other major advantage is that we had the option to get what we wanted out of fellowship without having to separate. I don’t think I could be away from my family for a year, and I really feel for those that have to make that decision. The only disadvantage that comes to mind from completing the same training programs is that we lack some diversity of background with regard to what we’ve been exposed to. I’m a big





believer in that the more diverse the training experiences of the team, the stronger the team. We're lucky in that the fellowship at Cleveland Clinic is a combined ortho-neuro program and all the staff bring something different to the table."

#### What is your typical day like?

**Christina:** "It's pretty unremarkable and I'm sure similar to other residents and fellows with kids and dogs...always on the tipping points of chaos! The best thing about our lives and this job is that it's never typical. I'm currently at MetroHealth at our Level I trauma center and I'm learning from several fantastic surgeons right now. Spine trauma is pretty complex and I enjoy the mental calisthenics involved in the decision making. When not operating or rounding, I try to spend a few minutes or hours on research, reading, and exercising. It truly depends on what the toddler, dogs, and life will allow!"

**James:** "On the whole I think we're up by 6 a.m. most days of the week and out the door pretty quickly. The Cleveland Clinic is interesting in the number of different rotations that the fellows go through, so we're exposed to diverse pathologies and decision-

making. Most rotations entail a couple days of outpatient clinic, a day or two of 2-4 routine cases, and a day or two of more complex procedures. We certainly take advantage of the later clinic mornings and earlier evenings when we can. Most days we're home between 6-8 p.m. and do everything we can at that point to throw together some type of dinner and spend some family time before our little one is off to bed. We have a few days with dedicated time for academic conferences and clinical research/medical student labs that we're involved with at both Cleveland Clinic and University Hospitals/Case Western and we devote at least a few hours a week to our work as section editors of the Early Career Forum that we started at World Neurosurgery."

#### How do you balance your home and work life?

**Christina:** "I'd probably have to say that it's all relative. Nothing is ever more out of balance than during chief year, so fellowship has truly allowed us to breathe. We have had a lot more time to spend with our toddler and our dogs as well as resume some extra-curriculars we neglected for the past few years. With regard to how, I'm sure for anybody in medicine with kids, life always feels like it's moving 100 mph, I'd have to say constant communication, persistence, afternoon naps when feasible, and prioritization. I play soccer Thursday and Friday nights which is probably a poor decision at my age, but I still can't let it go! James is way better at saying no, delegating tasks, and prioritizing so he probably feels a little bit less like he's drowning at all times. But, we're incredibly lucky to have grandmas intermittently living with us so I really can't take much credit for how our household survives."

**James:** "I think this is hard and I don't think we're ever perfectly balanced, like most. Most days are some sort of controlled chaos and I'm sure any two-physician family with a small child can relate, it may be a little exaggerated given the difficulty of neurosurgery residency and now fellowship, but the challenges are the same. I think I might be the lazy one in the relationship, but I'm fortunate that Christina really is the force that keeps our family moving. We're always tired, but she finds the energy to will us out to some adventure every weekend and I think having that time together is immeasurably important. The thing that has changed for me the most was efficiency of time management after we had our son. There are certain sacrifices that I learned to make and things I learned to do more quickly, because that short period of time at the end of each day with all of us together is really important for me and keeps things in perspective. I've also found that it's much easier to get through a tough day at work when there's something at home that you just can't wait to get back to."

We were also really fortunate in that we also trained with such a wonderful group of people, in both residency at Case Western and now in fellowship at Cleveland Clinic. If I could give any piece of advice to those who come after us, it would be to surround yourself with good people and do everything you can to not let spending time with them become a second-tier priority."



# The new online AO Spine North America Case Consult

## Discuss your cases in confidence with the North America surgeon panel

AO Spine North America recently started a new online education activity as a service for surgeons. If you have a spine case coming up and wish you had access to expert input in the planning, or if you recently completed a case on which you would like to receive feedback from the experts, or if you are interested in observing and learning from others' experiences, these sessions are for you.

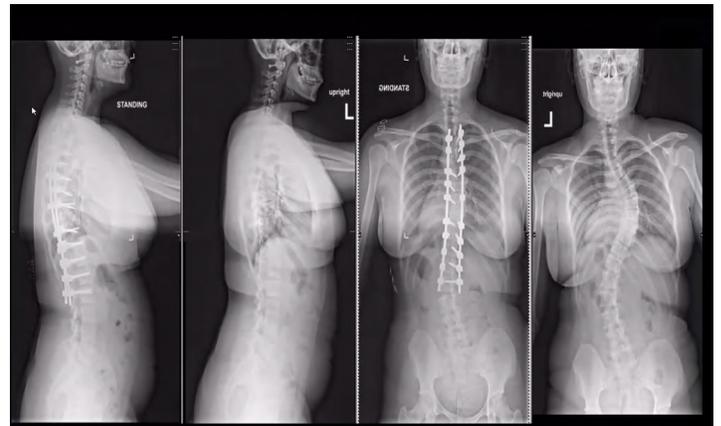
The AO Spine North America Case Consult series is held on the first and the third Monday of each month at 9:00 PM EST. The forum allows surgeons to present cases in a secure, safe environment, receive input on their treatment plans, and get feedback on completed cases.

The series is moderated by Dr. John France and different panelists are invited for each session. Participants are required to bring all supporting materials which contribute to the discussion. The structure and the processes supporting this session offer easy interactions with the learner and logistical efficiencies.

The Case Consult platform is aimed primarily at attending orthopedic spine and neurosurgeons, recent spine fellow graduates, and current spine fellows.

The discussions are relevant to orthopedic spine and neurosurgical practices, and address diagnosis, treatment, and management of spinal disorders and deformities. Expert input, coaching and advice helps with reflection and self-assessment.

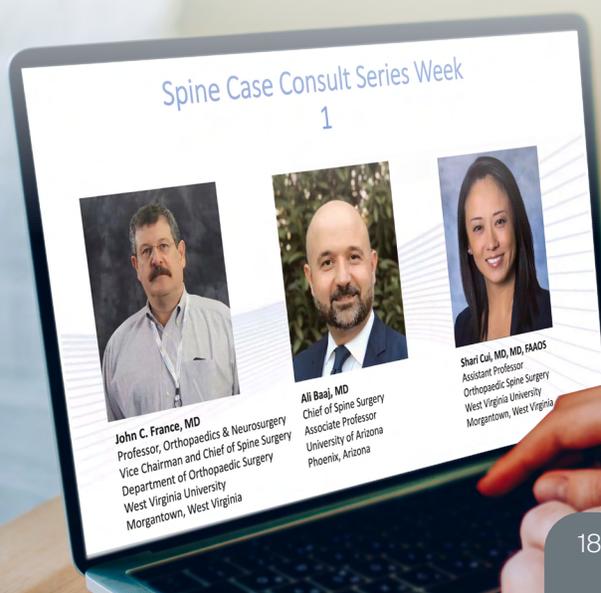
Such interactions in turn promote higher order thinking and clinical reasoning and decision making through effective facilitation and



group thinking. It also addresses barriers and challenges in obtaining optimal patient outcomes., Effective articulation of decision-making strategies adopted promote retention and comprehension.

The case consult sessions help surgeons presenting their case to articulate their thoughts and decision-making rationale to experts who in turn provide the feedback and coaching necessary to augment the experience and ensure learning happens.

Dr. France wants to keep the concept as easy going and simple as possible and to let the concept evolve. He encourages participants to share documents and images, and to bring along as many cases as possible to develop the sessions into online mentoring events.



## Navigating the grey zone

Ali Baaj and Shari Cui were invited as panelists for the first Case Consult on October 19, 2020. Both find the concept highly valuable. Baaj highlighted the value from the direct focus on the proposed diagnostic and management questions of your actual cases. "It's a safe and secure learning platform in which fellows and surgeons can share management questions and ideas of real clinical cases seen in their practice. It is a great platform to share knowledge and to answer questions in a confidential and collegial fashion."

Cui believes the initiative will evolve into a great resource for both established surgeons and for those early in practice. "Especially those who are the only spine-trained surgeons in a group practice can benefit a lot. There is so much gray area in spine surgery that having a second, third, or fourth pair of eyes on a difficult case can be beneficial to surgical decision making and patient counseling," Cui says. "This is a fantastic way of getting those perspectives from a diversely trained group of spine surgeons, and to hear their experiences with that particular pathology," Cui concludes.

## Making the decision can be the most challenging part

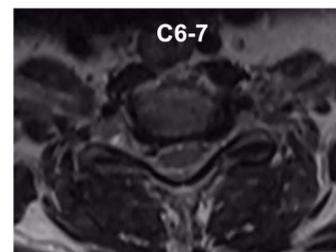
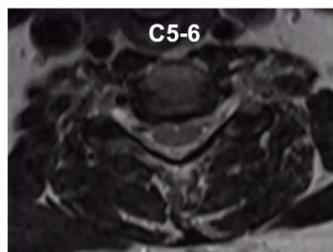
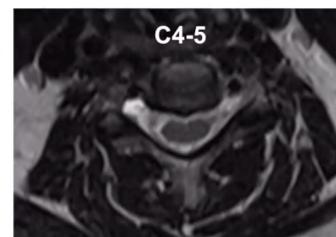
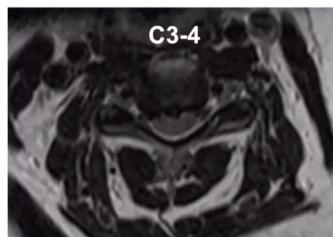
In the inaugural session, the panel kicked off with a debate on a "bread and butter" case of myeloradiculopathy from Cui. Not an unusual case, but one which can present a therapeutic dilemma, and where patient expectations may greatly vary to what the surgeon finds important to address.

"You've got to talk to the patient in order to not end up with a very unhappy patient," Baaj stressed, after which Dr. France polled the group for their views on treating the case. The differing approaches were eventually voted on, demonstrating that treatment decisions may be not clear cut at all.

A second case was presented by Michael Galgano, who says the feedback was exactly what he was looking for in his ongoing scoliosis case. "Traditional neurosurgery residency programs and spine fellowships tend to lack formal education on pediatric spinal deformity, because this subset of patients has traditionally been managed by orthopedic surgeons," Galgano explains.

"However, there are some dedicated neuro-spine surgeons, such as me, who have a growing interest in pediatric deformity."

## Diagnostic Testing and Imaging Studies



For Galgano it makes sense that, if you are taking on complex adult deformity surgeries, you should be able to apply your skillset also to the pediatric population. "The most challenging part of pediatric spinal deformity I have come across in my own practice is not necessarily the technical execution of the surgeries, but the complex decision-making and concepts unique to this sub-field," Galgano continues. "In an effort to deliver high quality spine care to my pediatric patients, I feel obligated to seek out every educational opportunity that arises."

## Continue to grow with feedback

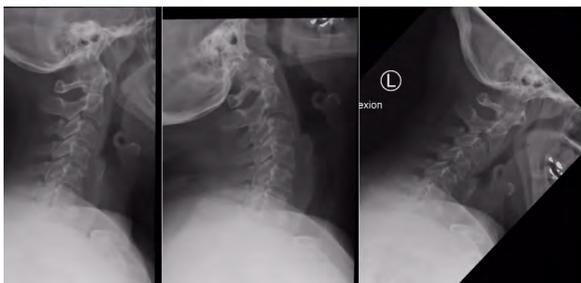
The AO Spine North America Case Consult series gives surgeons new to the profession an opportunity to put their critical thinking and decision-making on display for feedback from experts.

Galgano sees these kinds of experiences as necessary for continued growth as a surgeon. He welcomes any opportunity to discuss a recently completed case or upcoming surgery with someone more experienced and finds it to be of great value. "Although we may be comfortable in our current practice, the constructive feedback is what allows us to grow in the way we approach a case. It allows us to keep ourselves in check."

Galgano expects a good mix of retrospective review of completed cases as well as prospective discussions about upcoming surgeries to be the way forward with the Case Consult Series. "There are times when I am seeking input on a very complex surgery that I have yet to take on. Other times, I am looking for constructive feedback about a complex surgery I have completed and would like to discuss what I could have done differently. This would bring the most value."

Find out more about the upcoming Case Consult sessions and sign up [here](#).

## Diagnostic Testing and Imaging Studies

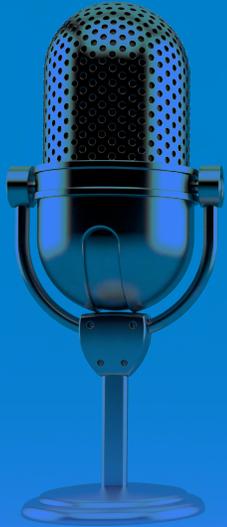


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### FOOTNOTE:

Galgano found out about the AO case consult on social media through Ali Baaj, who actively posts online about upcoming virtual educational events.



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is **important**

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What would you like to see in this newsletter? Would you like to write an article?  
Send an email request to:  
[lam.chi@aona.org](mailto:lam.chi@aona.org)

### In the Summer 2021 Issue...

- 2021-2023 AO Spine North America Fellowship Sites
- Congratulations to the 2021 Young Investigator Research Grant Award Winners
- 2021 Fellows Forum

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