

AOSpine North America Community News Winter 2016/17





Table of Contents

Content	Page
AOSNA Chairman's Message	3
From the Editor	4
AOSpine North America Board and Committees	5
Upcoming AOSNA Courses	6
Global Spine Congress 2017 Milan	7
AOSNA Young Investigator Research Grant Award Winner	9
Young Investigator Research Grant Awards	10
Committee Updates	11-13
AOSpine at NASS 2017	14-15
AOPOC - AO Patient Outcome Measurement Initiative	16-18
Management of Degenerative Cervical Myelopathy and Acute Traumatic Spinal Cord Injury	20
AONA Spine Fellowship	21-22
Dan Gelb Elected to the AOSpine North America Fellowship Chair	23
AOSNA Fellows start their fellowship experience	24
A Multi-Center, Randomized, Placebo Controlled, Double-Blinded Trial of Efficacy and Safety	25
Members Spotlight	26



Dear AOSNA Members and Colleagues,

I am honored, as the new chair of AOSpine North America (AOSNA), to welcome you to the Winter issue of the AOSpine North America Newsletter. We have been expertly led by Michael Fehlings for the previous three years. Please join me in thanking Michael, who will remain involved on the board, as Past-Chair and Treasurer of AOSNA. We have an exciting future with a committed board and great leaders in the Education, Research, Fellowship, and Community Development Committees. Our administrative staff is outstanding.

The Education Committee, led by Joe Cheng, has done an outstanding job, working on new initiatives in online education and development of the flipped classroom. Roger Hartl and Dan Gelb ran a fantastic initial effort at utilizing online resources that accompanied an in-person meeting on MIS. The online material, reviewed prior to the meeting, freed up time to focus on more case discussions and debates, and received excellent reviews from the participants. Additionally, the Education Committee has worked on the development of bioskills teaching at the resident meetings and is organizing resident education around the new milestone process that guides resident education in Orthopaedics and Neurosurgery. They are also searching for more ways to involve more faculty in the next year.

The Research Committee has new leadership under Jim Harrop, with Tom Mroz moving to Past Chair. Join me in a hardy THANK YOU to Tom for an excellent job! The committee has been quite busy overseeing three major prospective multicenter studies, as well as serving as the review body for Young Investigator Research Grants Awards (YIRGA). There is an evolution in research funding which will lead to all major research efforts being run by the AOSpine International Research Commission, which Jim sits on. Our Research Committee will form a review body for new ideas that are brought to the commission and continue to run the YIRGA program.

The Community Development Committee has also had a change in leadership, with Lali Sekhon taking over from Norm Chutkan. THANK YOU to Norm for his service to the community. The committee continues its work with a recently commissioned needs assessment and is diligently working through the data to identify member needs and how to better meet them, while improving our communication and improving access to resources held online by AOSpine. They also ran the recent AOSNA reception at NASS in Boston - an outstanding event with over 200 members and guests networking and socializing.

The Fellowship Committee, under the guidance of Ted Choma, has been hard at work on the Fellowship site selection process. This is a rigorous peer-reviewed process to award 25 fellowship sites out of 48 worthy applications. They also ran, along side the education committee, an extremely well received Fellows Advanced Spine Education Course in Seattle this past September, and are hard at work organizing the annual Banff Fellows Forum, held next year in March, along with the Research Committee and the Board.

The value and strength of AOSpine is the feeling of fellowship, the camaraderie, and the close personal relationships we have developed in a shared mission of spine knowledge creation and dissemination. I look forward to seeing you at AOSpine events in the coming year.

Sincerely,

Beedl

Darrel S Brodke, MD Chairman—AOSpine North America



Dear Colleagues:

It's my pleasure to take over from Norm Chutkan, MD as the Chairman on the ASONA Community Development Committee and continue his strong work in Community Development.

AOSNA kicked off the 2nd half of 2016 with its 3rd Annual Reception in Boston, MA on October 26, 2016. This was at the North American Spine Society meeting and was very well attended, confirming the camaraderie and collegiality that exists in the AO. This was probably our best reception to date with over 200 attendees.

AO has a busy next 12 months ahead with numerous courses and webinars for both residents/ fellows and practicing spine surgeons. Highlights of the next 12 months include the Global Spine Congress in Milan, Italy in May, 2017 and a new course focusing on nonclinical competencies for private practise spine surgeons scheduled for November 2017 in Las Vegas.

Our newsletter has the highlights of the educational, research and community development endeavors this past quarter.

It's my privilege and pleasure as a private practice neurosurgeon to take the helm of Community Development for AOSNA. For those of us in private practice and not members of the AO, there has never been a better time to join.

Sincerely,

Lali Sekhon Chairman AOSNA Community Development Committee



AOSpine North America Board and Committees

AOSNA Board

Darrel Brodke	AOSNA Chairperson
Michael Fehlings	Past Chair
Joseph Cheng	Education Committee Chair
James Harrop	Research Committee Chair
Lali Sekhon	Community Development Committee Chair
Ted Choma	Fellowship Committee Chair

AOSNA Education Committee

Chair

Chair Elect

Joseph Cheng John Devine **Rick Bransford** Dean Chou **Roger Hartl Bradley Jacobs** Eric Klineberg **Alpesh Patel**

AOSNA Research Committee

James Harrop Chair Tom Mroz Past Chair Samuel Cho Wellington Hsu Mohammed Shamji Michael Steinmetz

AOSNA Community Development Committee

Lali Sekhon Chair Norman Chutkan Past Chair Eric Massicotte **Ripul Panchal** Patrick Pritchard

AOSNA Fellowship Committee

Ted Choma Chair Daniel Gelb Chair Elect Christina Goldstein Brandon Lawrence Bob Molinari Dan Sciubba

Upcoming AOSpine North America Courses

Principles & Treatment of Spinal Disorders for Residents January 13-14, 2017 Las Vegas, Nevada

Complex Cervical Spine Surgery and Complication Management (with a Hands-on Bioskills Lab)

February 17-18, 2017 Tampa, Florida (C.A.M.L.S.)

AOSpine Fellows Forum March 30-April 2, 2017 Banff, Alberta, Canada

Adult Spinal Deformity Surgery and Complication Management (with a Hands-on Bioskills Lab)

May 11-12, 2017 Las Vegas, Nevada

Oral Board Review June 24, 2017 **Philadelphia, Pennsylvania**

Principles & Treatment of Spinal Disorders for Residents September 8-9, 2017 **Phoenix, Arizona**

Controversies in Complex Spine Surgery—A Comprehensive Handson Bioskills Course for Fellows September 14-16, 2017 Tampa, Florida

Principles & Treatment of Spinal Disorders for Residents October 13-14, 2017 Las Vegas, Nevada

Practice Essentials November 3-4, 2017 Las Vegas, Nevada

Minimally Invasive Spinal Surgery and Simulation November 11-12, 2017 Puerto Rico

For more information about the courses or to register, please go to:

http://www.aona.org

Course Spotlight Complex Cervical Spine Surgery and Complication Management

Feb. 17-18, 2017

Course Overview

Modern spinal surgery is constantly evolving and practitioners must develop treatment plans for increasingly complex conditions. Recognizing the complexity of an underlying pathology, analyzing the nature of the problem, and devising a detailed plan for accomplishing surgical goals is challenging for even the most experienced spine surgeon. The decision-making process now includes considerations of the 3-dimensional deformity aspects of complex spinal reconstructive surgery, the options for approaches to pathologies affecting different aspects of the spinal column, and selecting the most appropriate techniques to avoid potential complications associated with various spinal reconstruction techniques. This intensive course emphasizes the fundamentals of spine surgery, particularly biomechanical considerations, and the decision-making process. Through the

hands-on bioskills laboratory utilizing human anatomic specimens and didactic sessions, participants will engage in surgical techniques and strategies for a range of procedures. Complex surgical exposures in various regions of the spine will be emphasized.

Target Audience

Enrollment in this course is open to attending orthopedic and neurological spine surgeons

Course Co-Chairpersons

Dean Chou, MD University of California San Francisco

Philip Storm, MD University of Pennsylvania

Course Educational Advisor Richard Bransford, MD University of Washington



Global Spine Congress Milan, Italy | May 3–6, 2017



The GSC heads back to Europe for 2017. The AOSpine flagship event will take place in Milan, Italy, from 3-6 May, 2017 at the Milan Congress Center. For the 6th edition of the GSC, a record number of total 1048 abstracts for 25 available topics were submitted. The top 5 countries for abstract submission were USA, Korea, India, Italy and Germany, highlighting diversity of the Global Spine Congress.

High quality abstracts will gain entry into the events outstanding scientific program, providing the submitter an ideal chance to present his/ her research to hundreds of spine specialists in Milan. Additionally, all accepted abstracts will be published in the Global Spine Journal. The Scientific Program of the Global Spine Congress will include pre-Courses, AOSpine Symposia, Society Symposia, paper sessions and AOSpine Members-only sessions.

Register before December 21st, 2016 at www.gsc2017.org for an early bird discount.







The Global Spine Congress heads to Europe



Global Spine Congress Milan, Italy | May 3–6, 2017

www.gsc2017.org



AOSNA Young Investigator Research Grant Award Winner: Ankit I. Mehta, MD

Assistant Professor of Neurosurgery Adjunct Program Director, Neurosurgical Residency Program Adjunct Professor of Chemical Engineering and Orthopedic Surgery Director of Spinal Oncology Department of Neurosurgery University of Illinois at Chicago



"Intramedullary Spinal Cord Tumor: Potential Therapeutic Avenue through Nanotechnology"

As a young neurosurgery resident, I met my first spinal cord tumor patient who was a young 14-year-old girl. She had been diagnosed with a cervical intramedullary high-grade astrocytoma, and she was admitted for weakness after radiotherapy. As she visited our neurosurgery service over the next few months I saw her once bright smile disappear as the disease progressed. Eventually she did not come back, and we found out she passed away from her tumor. Unfortunately she wasn't my last patient with this terrible disease. My patients with malignant intramedullary spinal cord tumors have taught me humility in the face of this disease, one for which complex spine surgeons can offer very little.

Intramedullary astrocytomas are glial tumors responsible for 60% of all spinal cord tumors in children: 48% of such tumors are WHO Grade II, 31% are Grade I, and 21% are Grade III and IV. These Grade III and IV astrocytomas carry a poor prognosis with a mean survival of 15.5 months due to an infiltrative and aggressive behavior. The localized nature, the lack of a clear standard of care, and failure of current treatment regimens involving surgical resection, radiotherapy, and chemotherapy make these tumors an appealing target for novel, site-specific targeted therapy.

When I joined as a young faculty member at the University of Illinois at Chicago, I attempted to translate my focus on my patients from the operating room to the laboratory. In collaboration with the bioengineering department at the university, which is pioneering magnetic drug delivery in the CNS, we are attempting to utilize targeted intrathecal delivery of magnetic nanoparticles (MNPs) carrying chemotherapy to specific targets in the spinal column via an external magnet field. This platform of therapy could potentially be utilized for patients with intramedullary astrocytomas.

With the help of the AOSpine North America Young Investigator Research Grant, we have thus far demonstrated in an in-vivo model that we can successfully deliver MNPs to a specific location in the spinal cord. We have also done work to enhance the localization of the MNPs based on differing time intervals of exposure to the magnetic field. Our laboratory has now established an animal model of intramedullary astrocytoma utilizing malignant astrocytoma cells derived from human tumors and will soon perform experiments to test the localization and efficacy of chemotherapeutic-conjugated MNPs in the astrocytoma model.

We are grateful to AOSpine North America and the Young Investigator Grant in helping our laboratory provide evidence in a rat model that localization of MNPs is possible to a specific site in a spinal cord utilizing an external magnet. We look forward to continuing our research to advance the knowledge in the field of intrathecal magnetic drug delivery, and hopefully translating our work from the bench to the bedside to improve the care of our patients with spinal cord tumors.



AOSpine North America sends out call for Applications for the Young Investigators Research Grant Awards

The AOSpine North America Research Committee (AOSNARC) established research funding that is available to new investigators (within 5 years of first appointment) who have a desire to perform high-quality, clinically relevant spinal or spinal cord research in basic or clinical science. The purpose of these grants is to encourage new investigators by providing start-up funding of up to \$30,000.00 for one year. Consideration is given to two year applications, through the 2nd year of the grant will require a separate application and peer review.

Eligibility Requirements:

- The applicant and/or co-applicant must be a subscribing member of AOSNA.
- The applicant must be a physician, surgeon or scientist with focused interest in disorders of the spine/spinal cord and with an appointment at a university or hospital-based research institute.
- The grant application requires evidence that the investigator has the experience and resources to complete the proposed research.
- Successful applicants must agree to present their research findings at the Annual AOSpine North America Fellows Forum.
- AOSNA must be cited as the source of funding in any publication, presentation or in any publicity resulting from the award or its results.
- The number and amount of research grants awarded each year are at the discretion of AOSNARC.

For guidelines and application please contact Chi Lam: clam@aospine.org The deadline for submission is December 31, 2016.

Awards will be announced in March 2017 at the AOSNA Fellowship Forum.

Committee Updates

Education Committee Update

Education continues to be a cornerstone for AOSNA, and this is highlighted by the high-quality content provided by the AOSpine Education Committee. AO now delivers unparalleled education from those in training to those in practice, and continues to set the standard of educating educators. No other spinal surgery society has faculty training, which coupled with the fellowship of our group, has brought forth some of the most respected surgical educators in the world.

We recently held two successful education programs for residents; the Principles and Treatment of Spinal Disorders for Residents in Toronto on August 19-20, 2016 and in Orlando, FL on September 9-10, 2016. While we assume orthopedic and neurosurgery residents should know how to evaluate and exam patients, this curriculum is not formalized in many residency training programs. Participants remarked how they were surprised to gain a better understanding of "how to take an appropriate history, do a physical exam, and formulate an appropriate differential diagnosis". Participants also expressed they were "highly impressed with the learning style and knowledge that reflected clarity of thoughts so often needed for decision making in complex cases". This highlights our AOSNA faculty as educators, who are able to offer residents the epiphany of understanding the fundamentals of a patient history and physical exam, something many take for granted. Sometimes, we just don't know what we don't know!

The AOSNA Education Committee's work does not stop with residents, and continues on in collaboration with our AOSNA Fellowship Committee in providing the opening course of the AOSNA Fellowship Program with the Controversies in Complex Spine Surgery: A Comprehensive Hands-on Bioskills Course for Fellows held on September 15-17, 2016 in Seattle, WA. There, our AOSpine North America Fellows from 25 Fellowship sites along with the AOSpine North America Education and Fellowship Committees came together at the Seattle Science Foundation in Seattle, WA for a hybrid didactic, case based, and cadaveric training course giving our AOSpine Fellows the basic skills needed to excel in their Fellowship program. This highly interactive course highlighted advances, complications, controversies, and outcomes in the treatment of complex spinal problems, and set the bar for what is expected from a surgeon who calls themselves an AOSNA Fellow. Despite the development of Resident Milestones, we know that training differs between not only neurosurgeons and orthopedic surgeons, but from different institutions as well leading to varying degrees of skills and knowledge amongst our AO Fellowship class. This program allows the opportunity to not only cultivate the "base layer" of medical knowledge and understanding in spine surgery, but also fosters the friendships and comraderies of the AO Fellowship.

And of course, the last remaining hurdle after all the work of residency and fellowship in spine surgery is becoming board certified and taking the Oral Boards. This is why the AOSNA Education Committee developed the Oral Board Review Course such as the one held on June 25, 2016 in Philadelphia, PA. Comments from those who attended were glowing, noting that they appreciated the immediate feedback from the presenters, and how it allowed them to remain "focused on the material", as "in our busy schedules it is hard to make time for review and stay focused". The participants appreciate the helpful hints and pearls including "prepping for the presentation portion" with "good, constructive criticism". As noted in the beginning, education continues to be a cornerstone for AOSNA, and this includes our spine faculty and chairpersons. On August 5-6, 2016, we held our Spine Faculty Educators Training in Chicago, IL. Many still frequently ask "What is the goal of faculty development programs?". The goal of the faculty development programs has continually evolved and expanded, to reflect the changing needs of surgical education. Today all our AO programs are committed to offering the best educational experience possible and helping our experts in spinal surgery understand and be able to be more effective teachers and educators for the greatest benefit of our participants. This becomes easy when we begin with a cadre of such high caliber surgeons with all of us dedicated to the goal of improving patient care with new and meaningful knowledge, skills, and understanding that we develop and share as a group.

And finally, for our update, we will discuss the behind the scenes work in making all the educational offerings happen in AOSNA. On August 6-7, 2016, we held our AOSNA Education Planning Meeting in Chicago, IL, attended by all the committee members and senior educators in our group. This was a very important meeting as we are at a key inflection point in the evolution of AOSpine North America Education. The growing pressures and time constraints of a surgical practice, the plethora of industry sponsored spine courses, the declining availability of funding with healthcare reform, new regulations on surgical and resident training, are among just a few of the challenges we face at the AO. The planning meeting allowed us to work on ways and ideas to help assure that AOSNA continues to be a leader in North American medical education. We worked on specific questions which will help us to set the future of our educational programs, such as:

- Do we need to make changes in our education planning process? Why?
- Do our current education programs address the needs of our constituency?
- Is our current education relevant to our constituency?
- What is the basis for our current course portfolio? Why are we conducting these courses?
- What are the true reasons for creating and delivering education?
- What is the best way to plan education to be the most effective and ultimately help surgeons improve the outcomes of their patients?
- What is an appropriate timeline for planning our education activities?
- What are appropriate methods for marketing our education activities?

We have a challenge to rethink our approaches to education for the practicing surgeon, both those in the community and those in academics. To assure we are addressing the clinical problems of these surgeons and their educational needs, we are developing and adopting strategies such as the needs based planning process and adhering to timelines for planning. In essence, all the AOSpine Faculty are educational leaders, and we need everyone's participation as we work towards the future success of AOSNA's educational programs.

Committee Updates

Research Committee Update

We would like to thank Tom Mroz for his excellent leadership of the AOSpine North America Research Committee and guidance over the research team the last three years.

It is important to educate our membership on how the AOSNA Research Committee is set up to manage future changes that are being put into place. The AOSpine research organization, as with all of the other AOSpine efforts, consists of the 5 regions (North America, Asia Pacific, Middle East, Latin America and Europe/ Africa) with AOSpine International and ultimately the AO Foundation overseeing the organization. The Knowledge Forums (KFs) were created to focus and concentrate research interests in critical areas of spine, and are organized internationally. As such presently there are 5 KFs (SCI, Trauma, Deformity, Tumor, and Degenerative/ Biologic). The AOSNA research team is extremely proud of the tremendous leadership of our AOSNA members on these international committees.

In past years the AOSpine Regions controlled a great majority of the direction and choice of projects, with some funding going to the KFs. However, as care has improved around the world the differences between regions has lessened such that the concept of global care and treatment algorithms has evolved. AOSpine International (AOSI) and the AOSI Research Commission (AOSRC) aim is to globalize all research efforts through the AOSI Research Commission (with representatives of each region {research chair} and chairpersons of each KF), as well as board representation. As such, future research projects will go through the AOSRC from the regions and KFs. Thus any research ideas or proposals by you (our members) are encouraged and supported, and should be submitted to the AOSNA

Research Committee. We will review proposals on behalf of AOSNA and present to the commission for support of your proposal.

The AOSNA research effort has been outstanding, with patient care altering peer-reviewed studies and literature such as the AO Cervical myelopathy research, and AO odontoid fracture literature, in addition to numerous other publications. For example, in 2015, AOSpine's research efforts have resulted in 40 publications and 89 abstracts in the peer-reviewed publications. AOSNA completed a focus issue on the Management of the Aging Spine that was published by Neurosurgery in October 2015. In addition, due to the success of that publication, a second focus issue in Neurosurgery will be coming out in May 2017, concentrating on the evolving areas and instruments in spine surgery.

In addition AOSNA research will continue with the Young Investigators Research Grant Awards to encourage new investigators to perform high quality research in spine/spinal cord research in basic or clinical science. We recently sent out applications and each application will go through a rigorous review process and scored based on significance, approach, and feasibility of the study. Three winners will be selected and awarded up to \$30,000 each.

In summary, we are encouraged by continued excellent production of the AOSNA research team. The RISCIS study (Riluzole effect on acute traumatic SCI) continues to enroll successfully and is moving forward to completion. In addition the recent opening of iSpondy (Anterior vs Posterior approach for isthmic spondylolisthesis) has started enrollment. We look forward to ongoing success with highimpact, care-changing research, presentations, and publications going forward.

Fellowship Committee Update

The deadline for the call for applications for the 2017-2019 AOSNA Fellowship funding cycle has just passed. We have received 48 applications from outstanding programs throughout the United States and Canada. The committee has been hard at work improving the scoring criteria to ensure that site selection is a fair, transparent and merit-based process. A panel of 8 reviewers has been selected to score each of the applications based on the criteria of faculty involvement, clinical experience, educational environment and research opportunities at each institution.

In September, we welcomed the 2016-2017 AOSNA fellows at the Fellows Introductory course in Seattle, which allowed fellows to

meet their colleagues from other institutions as well as learn about AOSpine. In addition, fellows were given a Fellowship Handbook outlining the fellowship expectations as well as need-to-know information including a 90+ article fellows' reading list to help with self-directed learning about topics related to their clinical experience.

One of the initiatives of our Fellowship Committee is to step up efforts to engage fellows after their training ends. Beginning in 2017, we will invite some of our past fellows to serve as table instructors for the AOSNA Residents Courses. This will allow fellows to remain involved in AOSpine while also gaining further teaching experience.

Committee Updates

Community Development Committee Update

The AOSpine North America Community Development Committee has had a busy summer and fall. The highlight was 3rd Annual AOSNA reception which was also held in on October 26, 2017 at the North American Spine Society meeting, in Boston. This was very well attended and reinforced the collegiality and camaraderie of AO members and built on the 2 prior successful receptions in San Francisco and Chicago.

- 1. Women in the AO: To better assess the desires and needs of female spine surgeons the Community Development Committee aided by Michelle Clark, MD and Christine Goldstein, MD sent a pilot survey to residents in 3 programs to gauge ideas on mentorship and attitudes towards why a career in spine surgery would be taken. Initial surveys have been sent and collated. A 2nd round of surveys is going out. Once these are synthesized a questionnaire will then be developed that will be distributed to all residents at ACGME-accredited Orthopedic Surgery and Neurological Surgery training programs. The hope is we can encourage our female counterparts to become more involved with the AO.
- 2. Practice Essentials Meeting: In concert with the education committee, Joseph Cheng, MD and Chitra Subramaniam, MS, PhD, AO is developing a course aimed at developing non-clinical competencies for practicing spine surgeons. The course will be a 2 day course in Las Vegas in November, 2017 and will cover a spectrum of topics including legal issues, contracting, marketing, and other vital yet non-clinical competencies essential to running a private practice. This is an exciting endeavor building on the AO foundation of competencies in clinical care and promises to be a popular and well-received course.

- 3. Social Media: AOSpine North America is now on facebook, twitter, and instragram!
 - f facebook.com/aospine-North-America
 - e @aospineNA
 - in aospine
 - aospine_NA
- 4. Member Engagement Opportunities: Many members want to contribute and there a 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 CLam@aospine.org
- 5. The AO North America app: coming to an android and iOS in the near future!

2017 promises to be an exciting time for AOSNA and its members. If you are not a member, there has never been a better time to join.

AOSpine at NASS 2017



AOSpine North America joined AOSpine International with a booth at the North American Spine Society (NASS) Annual meeting from Oct. 26-28. Our team was on-hand to highlight the membership, upcoming educational events, newest publications, and answer general questions about AOSpine. Some participants stopped by to hear more details about how to collect patient-recorded outcomes with the AO Patient Outcomes Center.

Thank you to the many surgeons who stopped by our booth to learn more about our organization.

AOSNA Reception



AOSpine North America welcomed over 250 members and non-members alike by hosting a reception at the Sauciety American Grill at the Westin Boston Waterfront Hotel during the North American Spine Society Annual Meeting. The turnout was amazing!

The first day of the NASS Annual Meeting turned into a delightful get-together of old friends and new acquaintances getting to know each other. Networking in an informal environment was the aim of the reception held on Oct. 26. The evening set off on a friendly note as attendees crowded the venue. One could hear the happy chatter lighten up the ambiance. Some voiced their expectations for this year's NASS meeting, some socialized and met new people, and still others were quiet but curious observers.

Overall, the evening was a huge success as everyone settled into the relaxed evening in anticipation of the busy NASS schedule for the days ahead.







AOPOC—AO Patient Outcome Measurement Initiative

The AO patient outcome measurement initiative has been launched by AOPOC US Inc., and funded by the AO Foundation and AO North America. The project was initiated to create a software platform that a typical orthopedic surgeon could use to collect scientifically-validated patient reported outcome measures to help improve clinical care. The project team included multiple surgeons from different subspecialties as well as National Institute of Health (NIH) researchers from Northwestern University.

AOPOC builds on outcome measures and computer adaptive tests created by the NIH PROMIS (Patient Reported Outcomes Measurement Information System®) and allows patients to respond to questions on any internet connected device with a web browser. Computer adaptive tests make it possible to collect very accurate information in just a few questions. Patient data is stored securely in electronic form and can be shared graphically with patients at any time to help them better understand their recovery.

AOPOC has been developed specifically to support US Orthopedic surgeons' efforts, with particular emphasis on single-provider or small practices. The AOPOC system does not depend on any other electronic systems, and instead delivers a comprehensive patient-reported outcome data collection system that is ready to use with very little configuration.

Product Description

AOPOC is a stand-alone, web-based SaaS (software-as-a-service) application used by clinicians and researchers to collect patient- and physician-reported data. The platform allows flexible, surgeon-driven collection of standard, validated measures. It is a low-cost solution to a gap in patient data that many surgeons are currently looking to fill.

AOPOC can be used on any device with an internet connection and a web browser installed (i.e. a computer or tablet). A registration/license fee is required to use the system, as well as the cost of the computer or tablet used to administer the assessments.

The user starts by choosing measures from an ever-expanding list, and combining them into an assessment (or battery) that will be given to specified patients at every clinical encounter. The provider can register a patient into the system ahead of a visit, or on-the-fly when a patient arrives. During the clinical encounter, the patient completes the short group of measures while in the waiting room or in the exam room. Depending on the number of measures the provider decides to include, data collection time could be as little as under 2 minutes. After the patient completes the assessment, the provider may choose to enter data specific to that patient's injury or surgery. The data entered is immediately available through AOPOC, in a graphical form, for review by the provider, potentially with the patient, to spur discussion. The process repeats for every clinical encounter, if desired by the provider. See Figure 1 for a graphical representation of the AOPOC Clinic Workflow.

Figure 1.



This data can be used for many purposes, at the discretion of the provider and is owned by the entity, in full.

The system can be used by any professional or support staff in the clinical setting, as authorized by the contracted provider. The provider has full control over adding accounts, deleting accounts and modifying permissions within each of the accounts.

Currently, AOPOC is intended for use in a clinic, on a clinic-owned device, where a provider or support staff can log into the system and setup an assessment for a patient; a patient cannot complete the assessment on his/her own device, or from home, although this may be a feature added to the system in the future.

Data can easily and immediately be exported in CSV format, for use in statistical software, or to upload to a larger database. Data aggregation across providers, or within predefined systems (e.g. a statewide orthopaedic association) can be negotiated in concert with the AOPOC business team. Measures are designed to be administered and reported in a standard format, for ease of aggregation of datasets and interpretation of pooled results.

AOPOC instruments and data formats are recognized by qualified PQRS reporting registries as satisfying multiple required measures. PROMIS measures, specifically, are intended to cut across disease and population boundaries, to quickly obtain validated data to satisfy many quality indicators. CMS has put an emphasis on patient-reported data in recent years, and requirements for this type of data collection are predicted to expand every reporting year. The AOPOC product team is committed to staying informed about changes to CMS requirements, and ensuring the compatibility of AOPOC for use in reporting. The list of instruments available in AOPOC is ever-expanding to accommodate additional disease-specific or newly validated. All instruments are scientifically validated. The system also has the ability to collect data points relevant to the specific practice, such as patient demographic data or patient record number. Generally, AOPOC can handle any standard type of data that a provider may want to collect, and is flexible in this manner.

A unique feature of AOPOC is the inclusion of PROMIS CATs. PROMIS CATs are reliable, valid, precise, quick, psychometrically sound measures, developed using state of the science methodology and modern psychometric theory. Patients are presented with a minimum of 4 items per measure, and a maximum of 12 items. Data collection during the beta phase revealed results similar to other studies using PROMIS CAT measures. Beta patient-participants were presented, on average, 4.49 items when completing the PROMIS Physical Function CAT (n=7965), and 5.01 items when completing the PROMIS Pain Interference CAT (n=7896). Previous research shows that PROMIS items, when computer-administered, can be answered at an average rate of 5-6 items/minute. This results in AOPOC patients completing the standard battery (PROMIS Physical Function and PROMIS Pain Interference) in under 2 minutes.

PROMIS CAT measures, as administered in AOPOC, provide real-time scoring and reporting functionality. Scores reference the US population. No population-specific (e.g. total joint replacement) norms are available at this time, but research is ongoing. AOPOC will benefit from new norms as they are developed.

Scores for PROMIS CATs are displayed graphically and available to the provider immediately following data collection. All scores collected in AOPOC for that patient are displayed on one graph, for easy interpretation of self-reported health over time. The AOPOC report (see Figure 2 for an example) can easily be printed and filed with the patient's chart, or saved as a file to be uploaded to another system. This workflow is flexible and at the discretion of the individual provider.



	Jul 27, 2016	Aug 02, 2016
PROMIS Bank v1.0 - Pain Interference	59.65	59.13
PROMIS Bank v1.2 - Physical Function	44.19	48.75

ROMIS scores: 10-80. Average in American Population (not injured) is 50, Standard Deviation is 10

I'm interested!

Figure 2.

To get started using AOPOC in your practice, contact sales@aopoc.com (610.249.0388) Schedule a demo or visit the AOPOC YouTube Channel to learn more. For all other inquiries, visit our website at www.aopatientoutcomescenter.com



Education AO Surgery Reference— Expertise just when you need it

Whether you are conducting research or preparing for surgery, this is a one-stop tool for a wide range of surgical procedures and approaches.

Lawrence Lenke—Executive Editor

From diagnosis to aftercare, your detailed step-by-step guide

- AIS Thoracolumbar Trauma Subaxial Cervical
- Coming December 2016—Occipitocervical and Sacropelvic

General editor

Luiz Vialle

Renowned authors

- Carlo Bellabarba Michael Fehlings
- Marcelo Gruenberg Frank Kandziora
- Han Jo Kim Marinus de Kleuver Keith Luk
- Cumhur Oner Jean A Ouellet
- Shanmuganathan Rajasekaran Klaus Schnake
- Alex Vaccaro
 Emiliano Vialle

Executive editors

- Kenneth Cheung Lawrence Lenke
- Luiz Vialle







www.aosurgery.org

An Update on a Guideline Project for the Management of Degenerative Cervical Myelopathy and Acute Traumatic Spinal Cord Injury

While both acute traumatic and chronic compressive spinal cord pathologies have been recognized for centuries, many fundamental questions remain about their optimal management. These include such seemingly basic questions as: What is the natural history of neurologic decline (in chronic degenerative cervical myelopathy DCM) or recovery (in traumatic spinal cord injury (SCI))? And what are the best diagnostic modalities and how do these inform treatment decisions? Intrinsically linked to these enquiries is the basic question surrounding the role of decompressive surgery in stabilizing or improving neurologic function. What surgery (if any) should be performed? What are the clinical results of such an invasive intervention in terms of altering the natural course of neurologic recovery or decline? If it is to be performed, when would be the optimal timing for surgical intervention? Furthermore, questions remain about the efficacy of other potential treatments aside from surgical decompression. Might there be medical therapies that could influence neurologic outcome and/or rehabilitative interventions that could promote functional recovery?

As a result of these significant knowledge gaps, AOSpine, in collaboration with other societies, undertook an initiative to develop clinical practice guidelines to outline how to best manage patients with DCM and traumatic SCI. In order to do this, systematic reviews were first conducted to summarize the current body of evidence and to address the aforementioned clinical questions. Second, a multidisciplinary guideline development group used this knowledge, in combination with their clinical expertise to develop recommendations in a process that adhered to methodology proposed by the Grades of Recommendation, Assessment, Development and Evaluation (GRADE) Working Group. This methodology allows for consensus building that extends beyond merely the strength of the available scientific evidence and considers other important factors such as feasibility, acceptability and a balance of risks and benefits.

For DCM, the guideline development group aimed to address the following clinical questions: should operative management be used to treat patients with moderate or severe myelopathy; should operative/nonoperative management be used to treat patients with mild myelopathy; and should operative management be used to treat nonmyelopathic patients with evidence of cord compression with/without signs or symptoms of radiculopathy. To formulate recommendations, the guideline development group considered disease natural history, the effectiveness of nonoperative versus operative treatment, the impact of preoperative duration of symptoms and myelopathy severity on treatment outcomes, predictors of neurological deterioration and risk factors of myelopathy development.

For traumatic SCI, this guideline revisited some of the most controversial questions of management, including the timing of surgical decompression and the use of high-dose methylprednisolone. The guideline also considered the role of magnetic resonance imaging in clinical decision-making and prognostication, the type and timing of anticoagulation strategies and the type and timing of rehabilitation.

Both guidelines are currently undergoing external review by a spectrum of organizations, expert clinicians and patient advocates. The plan is to publish these guidelines as a focus issue in spring 2017; this issue will consist of a summary of the methodology, results from the systematic reviews and a guideline document that includes recommendations and justification for these recommendations.

Stay tuned!

AONA Spine Fellowship: Reflections on a Year Well-Spent and Advice for Future Fellows

Byron F. Stephens, MD Assistant Professor Vanderbilt University Department of Orthopaedics and Rehabilitation Vanderbilt Spine Center Nashville, Tennessee



Budding spine surgeons choose their fellowship program for a variety of reasons. Some of these reasons are professional and some are personal. Tangible factors that we all look for in our fellowship search include reputation, surgical volume, autonomy, case variety, and the clinical and research interests of the faculty. While residency provides the foundation of your skills as a surgeon, fellowship is undoubtedly the best part of the training process: the proverbial icing on the cake of our surgical education.

Rest assured, there are different flavors of fellowship to match your career goals, whether they involve rising in the ranks of academia or providing a solid foundation for a career in private practice. The same can be said for the niche of spine surgery you see yourself practicing. Minimally-invasive wizard? Degen master? Deformity guru? Well-balanced comprehensive spine surgeon? There's a fellowship out there that's right for you and your future practice.

However, one of the intangibles that is perhaps overlooked when selecting your fellowship is the people you will learn from and the relationships you will build during the year. These faculty will become lifelong mentors and friends. They will, in essence, become your spine surgery family. They will help you with everything from society memberships to your job search. And as you begin your practice, you will undoubtedly lean on these mentors for sage advice on difficult cases.

My year as an AOSpine North America fellow at Emory University was an incredible experience. I honed old surgical skills, learned some entirely new ones, and operated on all areas of the spine from all directions. I received wisdom freely imparted on me by my mentors that gave me a completely new perspective and made me a different, better surgeon than I was at the end of my residency. As Dr John Rhee says, we did the "biggest of big and the smallest of small" cases and everything in-between. I made life-long friends with my three co-fellows and our international fellow visiting from China and learned a lot from their different training backgrounds. We continue to share cases on a daily basis and I value their input immensely.



Being an AOSpine North America fellow offers advantages that should not be overlooked. A two year membership in AOSpine is included for all fellows, which grants you access to the immense online AOSpine platform of resources. The Fellows Course at the beginning of the year offers a comprehensive, hands-on overview of spine surgery. This can serve as a great platform to revisit some of the principles of spinal decompression and instrumentation from the occiput to the sacrum. In addition, it affords you the opportunity to see some different techniques than what may be taught at your fellowship. Finally, the AOSpine North America Fellows Forum in Banff, Canada serves as an incredible capstone to the year. Fellows from all AOSpine North America programs gather to present their research and network in the shadows of the Canadian Rocky Mountains.

Reflecting on his own final year of training, my fellowship director, Dr. John Heller, said that at the end of the year he was fully satisfied that he had "sucked the marrow out of the bone" of a year fully invested in becoming a spine surgeon. As I look back on my fellowship from the dawn of my practice, I feel the same and would suggest that all spine fellows approach the year with that same goal and level of enthusiasm.









Dan Gelb elected to take on the role of AOSpine North America Fellowship Chair commencing Aug. 1, 2017



AOSpine North America is happy to announce that Dr. Daniel Gelb has been elected as the new AOSNA Fellowship Chair. He will join the AOSpine Fellowship Committee as Chair Elect on Sept. 1, 2016 and start his official 3-year term as Fellowship Chair on Aug. 1, 2017. The position is currently held by Dr. Ted Choma.

Dr. Gelb currently serves as Professor of Orthopedics at the University of Maryland School of Medicine and Co-Director of the Spine Program at the University of Maryland Medical Center. A longstanding member of the AO community, Dr. Gelb has demonstrated a consistent dedication to AOSpine and has been a leader in developing new educational initiatives at the Resident, Fellow, and Attending levels. His concept of the interactive case-based curriculum has been adopted for the AOSNA Resident Course and has served as a model for other courses. Recently, his efforts were instrumental in developing a new web-based curriculum for the Minimally Invasive Course based on the "flipped classroom" model.

Please join us in congratulating Dr. Gelb has he assumes his new role within the AOSNA organization.

AOSNA Fellows start their fellowship experience with interactive course



This past fall, 42 AOSNA Fellows from 23 different institutions convened in Seattle, Washington to participate in the "Controversies for Fellows" course. Held at the Seattle Science Foundation Bioskills Lab, the highly interactive 2.5 day course covered a wide range of topics including, but not limited to, motion preservation, bone biology, minimally invasive spine surgery as well as diagnostic issues, treatment methods, patient selection, and indications for surgical techniques. The orthopedic and neurosurgical fellows participated in lectures taught by expert faculties, case presentations, small group discussions and intensive, hands-on sessions utilizing human anatomic specimens.

As part of their fellowship package, AOSpine fellows were given a complimentary AOSpine membership as well as access to a wide variety of educational resources including participation in various AOSNA courses, recommended reading lists geared towards fellows, webinars on a variety of topics, spine surgery reference modules, and many more. This coming March, the AOSNA Fellows will be invited to participate in the 15th Annual AOSNA Fellows Forum in Banff, Alberta, Canada, which will highlight the collective efforts and achievements of the fellows and their program directors.



A Multi-Center, Randomized, Placebo Controlled, Double-Blinded Trial of Efficacy and Safety

Spinal cord injury (SCI) results in devastating physical impairment and is associated with significant costs to the individual and to society. There is compelling evidence that the pathobiology of SCI involves an initial primary mechanical injury which is amplified by a complex series of secondary injury events including ischemia, ion channel dysfunction, glutamatergic excitoxicity and apoptosis. Riluzole, a sodium-glutamate antagonist, which is approved as a treatment to attenuate the rate of nerve cell degeneration in amyotrophic lateral sclerosis (ALS), has shown considerable promise as a therapeutic strategy to enhance outcomes in preclinical models of traumatic and non-traumatic SCI.

A few years ago, AOSpine North America, led by principal investigator Dr. Michael Fehlings (chair of the AOSpine SCI Knowledge Forum and past chair of AOSpine North America) set out to obtain clinical evidence on the safety and efficacy of the drug riluzole in improving outcomes after spinal cord injury (SCI) in patients. Further proof supporting its safety when delivered to patients immediately following injury had been obtained in a U.S. Department of Defense-funded phase I/IIa clinical trial (undertaken by the North American Clinical Trials Network-NACTN, in partnership with AOSpine) between 2010 and 2011 in which many AOSpine North America members participated as investigators. This Phase I/IIa prospective, cohort-controlled study also showed promising proof-of-concept data suggesting potential neuroprotective efficacy particularly after cervical SCI.

AOSpine North America's multi-center trial was initiated in 2013 under the abbreviated title "Riluzole in Acute Spinal Cord Injury Study: RISCIS". Since then, the trial has grown to include 22 sites across the United States, Canada and southeastern Australia. There are plans in motion to further expand the trial to additional North American sites and other regions in Australia. Spine clinician-scientists from Europe, Asia and the Middle East have also voiced their interest in joining this collaborative international research effort.

The RISCIS trial is now a combined project supported by the following entities: AOSpine North America, AOSpine International, Christopher and Dana Reeve Foundation's North American Clinical Trial Network (NACTN), Ontario Neurotrauma Foundation, U.S. Department of Defense and Rick Hansen Institute. In recognition of the potential significant impact that RISCIS may have on SCI treatment, the participating sites and principal investigators have all agreed to subsidize many of their internal costs in order to be able to participate in the study. Their willingness to contribute their own time and funds has technically made this a study with more than 25 sponsoring organizations.

Many of the sites have taken this opportunity to initiate SCI sub-studies. These include efforts to research: MRI biomarkers in SCI, the pharmacokinetic properties of the study drug and quality assurance comparisons for patients presenting with SCI to two separate hospitals in the same health system. As of today, RISCIS has enrolled 51 subjects.

As indicated by RISCIS principal investigator Dr. Michael Fehlings (Professor of Neurosurgery at the University of Toronto), the RISCIS trial shows "considerable promise to enhance the neurological outcomes and quality of life and reduce the costs of care for individuals with acute SCI".

AOSpine International, AOSpine North America and its collaborating partners would like to take this opportunity to thank all of the investigators, study coordinators and AO members for their continued efforts in promoting world-class SCI research through their participation in the RISCIS trial. For more information about the trial, please email: **RISCIS@nor-consult.com**

We look forward to bringing the AO community further updates about the trial as they become available.

The Knowledge Forum SCI

The Knowledge Forum SCI is one of the five pathology focused working groups acting on behalf of AOSpine. Chaired by Dr. Michael Fehlings, this group of international experts consists of Dr. Robert Grossman, Dr. Shekar Kurpad, Dr. James Harrop, Dr. Bizhan Aarabi and Dr. Brian Kwon. In addition to this flagship project, this group of key opinion leaders is also interested in two other areas: a) the development of evidence-based clinical guidelines for the treatment of acute spinal cord injury; b) an overall description of the SCI patient population through the extensive sample size provided from the merge of two databases (NACTN – The Christopher and Diana Reeve Foundation's North American Clinical Trials Network – PI: Robert Grossman; and STASCIS – The Surgical Trial in Acute Spinal Cord Injury Study – PI: Michael Fehlings).



Member Spotlight Christina Goldstein MD, FRCSC

Question: Please tell us a little about yourself.

I am an adult orthopaedic spine surgeon at the University of Missouri in Columbia, MO. I am an Assistant Professor, was recently appointed Director of Spine Research for the Department of Orthopaedic Surgery and am the only tenure-track female surgeon in our department. I completed my orthopaedic surgery training at McMaster University in Hamilton, Ontario, after which I completed three years of fellowship training at two AOSNA fellowship sites, the University of Calgary at the Foothills Medical Centre and the University of Toronto at the Toronto Western Hospital. When I am not taking care of patients, teaching, working on research, or mentoring medical students, residents and fellows, I can be found doing on-line coursework to complete an MPH degree part-time at the Johns Hopkins Bloomberg School of Public Health. I am married, have one cat, and am a proud aunt to three handsome nephews and a beautiful niece. During my free time I love to read nonfiction, knit/ crochet and watch movies.

Question: How and when did you get involved with AOSpine?

I was fortunate to become involved with AOSpine when I became a fellow at the University of Calgary in July 2011. In fact, the opportunities available to AOSNA fellows were one of the main reasons I chose to pursue my spine training at Calgary and Toronto. Since then I have been lucky enough to attend the Fellows' Forum in Banff multiple times, have been a member of the Fellowship Committee since 2014, Co-chair of the Women in Spine Task Force and this year became Faculty for AOSNA.

Question: Why do you think there are so few women in the spine field?

Fundamentally, this relates first and foremost to the low numbers of women entering the fields of orthopaedic surgery and neurosurgery. Despite the fact that 58% of undergraduate students and 47% of medical students are female, only 16% of residents in

ACGME neurosurgery programs and 12.6% of ACGME orthopaedic surgery trainees are women. Lack of female mentors and women in leadership positions, lack of exposure during medical school to orthopaedics or neurosurgery, misperceptions about the rigors of training and concerns regarding work-life balance may deter females from entering these and other surgical specialties. Subsequently, lack of female mentors in spine surgery and concerns regarding the length of fellowship training and perceived need to give up other areas of neurosurgery or orthopaedic surgery may lead residents to pursue other areas of subspecialty training. Achieving a clear understanding of this phenomenon is high on the priority list for the Women in Spine Surgery task force and is why we are actively engaged in surveying male and female orthopaedic surgery and neurosurgery residents regarding subspecialty training choices.

Question: What do you think AOSpine offers for female spine surgeons?

AOSpine offers all spine surgeons, both male and female, the opportunity to belong to a close-knit, collegial organization that fosters excellence in research, education, clinical care and mentorship. It allows surgeons with varied interests a variety of opportunities to become involved, gain new skills and pursue leadership opportunities within the organization.

Question: What advice do you have for young surgeons to get involved in our organization?

Don't be shy! If you have a passion for mentoring, teaching, research or committee work let your contacts within AOSNA, either faculty or the administrators, know. The earlier and more often you demonstrate your interest in becoming an active member of AOSNA, and can contribute productively to the activities of the organization, the more likely it is that your name will be at the forefront of the minds of course organizers, focus issue editors and webinar developers when they are looking for volunteers to assist with these important activities.



Get updates on the latest news, events, course registration openings, and much more



AOSpine North America on FACEBOOK



AOSpine_NA on Instagram



AOSpineNA on Twitter



Coming Soon AOSNA on YouTube

AOSpine North America 1700 Russell Road Paoli, PA 19301

T (610) 993-5131 F (610) 695-2420 clam@aospine.org www.aospine.org



- 🕤 aospine_NA