# WFNS
# SPINE COMMITTEE

1st Issue | 2020






# EDITORIAL

by Oscar L Alves

Dear colleagues,

The first WFNS Spine Committee Newsletter had a significant global outreach, reason why we are back with a new issue.

Meanwhile, the WFNS Spine committee promoted several consensus conferences on hot spine topics, such as cervical spondylotic mielopathy, lumbar stenosis, and cervical trauma and spinal cord injury. The recommendations have been published or are currently in press. We believe they will constitute a valuable tool to improve the outcomes of spine surgery in different latitudes

Due to the tireless effort and leadership of Prof Mehmet Zileli, a comprehensive education program was also accomplished with cadaver labs, seminars and courses in different locations in the world. For the first time, the Spine Committee promoted several webinars that were judged as very high quality ones.

As this newsletter is also your spine forum, I invite you to share your most valuable expertise with a wide community of surgeons.


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# CHAIRMEN'S MESSAGE

Dear Friends,

Welcome to the Spine Committee of the World Federation of Neurosurgical Societies. It is our honour and privilege to lead the best of the best in the Spine Section of WFNS.

The last 2 years have been wonderful for the WFNS under the leadership of Professor Franco Servadei. The Spine Committee, under the dynamic guidance of our prolific chairman Professor Mehmet Zileli, has worked tirelessly to make noticeable progress over this period of time. Our workshops and courses have helped to provide a vast platform which facilitates in imparting knowledge and expertise of the best spine practices, to help young surgeons excel in their field. We would like to thank every member for being an integral part of our committee. We would especially like to thank the members who arranged or participated in various educational activities with their never-ending enthusiasm and passion.

In this period of time, we could reach some of our aims such as "consensus meetings" and recommendations on some common spinal disorders. Recommendations were published in Neurospine Journal and in this web site. We started monthly webinars and will continue them in 2020.

For the next two years, all three of us will be co-chairing this talented family. Our goal will be to build on these achievements, by continuing to provide state of the art training in the field of Spine to doctors around the world. We aspire, as always, to research into the cause, prevention and cure of human diseases in the field of Spine through our collective expertise and knowledge.

Thank you for being with us.

Mehmet Zileli
(Turkey)

Maurizio Fornari
(Italy)

Salman Sharif
(Pakistan)

# Learning from Experience

by Noorulain Iqbal, Salman Sharif

Dr. Richard G. Fessler is a Professor at the Department of Neurological Surgery at Rush University Medical School in Chicago. He completed his Medical Doctorate with honors and completed surgical and neurosurgical residencies at The University of Chicago. In addition to surgical training, Dr. Fessler completed a Doctorate of Philosophy in Pharmacology and Physiology, and a Master of Science in Psychology. Continuing education after earning doctoral degrees, Dr. Fessler held research fellowships at The University of Chicago Medical Center in Neurological Surgery and Psychiatry. The Chicago Surgical Society honored him with the Excellence in Surgical Research award.

Dr. Fessler has made significant contributions to endoscopic and microendoscopic surgical techniques. His first area of interest in research is the development and refinement of minimally invasive spine surgical procedures. The Kambin Foundation awarded Dr. Fessler with the annual research award for his research in the field of minimally invasive spinal surgery. The second area of interest is both basic research and clinical trials involving stem cell transplantation to treat spinal cord injury and paralysis. Dr. Fessler is a member of the International Society of Minimally Invasive Spine Surgery, Lumbar Spine Study Group, Neurosurgical Society of America, and Selby Spine Society.

**1. Why did you choose neurosurgery?**

I think in many ways, neurosurgery chose me and I didn't choose it. When I started college I became very interested in human behavior and animal behavior. But then, it very quickly evolved into the chemistry and the pharmacology of behavior. And through college, through my Master's Degree and Ph.D. I was always doing neurochemistry related behavior, always related to the brain actually. Then when I got into medical school, it very quickly evolved into neurology, psychiatry, or neurosurgery. And having grown up as a carpenter, working with my hands is very enjoyable, so neurosurgery was the obvious way to go.

**2. Can you tell me about your mentors throughout residency in neurosurgery and spine surgery?**

Sure. One of my 2 major mentors was Will Rhoton, this was the years of me becoming an attending. And my chairman at the University of Chicago was also a major influence on my career was Sean Mullan. I actually learned spine surgery through one of my attending there, his name was Fred Brown. And it's really interesting how small a world it is. He taught me spine surgery and I later taught him how to do minimally invasive spine surgery and he eventually operated on my son using the operation I taught him.

**3. What I have read about you is that you've been doing research on spinal cord injury treatment. Can you just tell me first what inspired you to start this research?**

In high school and college, I was a collegiate wrestler and when I was in practice one day in college one of my fraternity brothers and close friend of mine broke his neck on the mat and immediately became a C5 quad. So that was the initiation of my interest in what clearly was a devastating injury that could occur with such little of an impact. When I then became eventually an attending at the University of Florida, they have the leading spinal cord injury research teams in the United States. So it just made sense for me to become involved in their research.

**4. How far have you come since did you start this research?**

The first research in humans was in the mid-1990s. At that time, we had not yet stem cells. So the cells we collected were from voluntarily aborted fetuses. This was extremely controversial research at the time. And we were only allowed by the FDA to do implantations in chronic injuries in the thoracic spinal cord because that was the safest way to do it. All our original patients had syringomyelia, so they were going to undergo surgery anyway. They elected to have transplantation of these embryonic cells as well as drainage of their syringomyelia.

In those early studies, we had very little in the way of positive results. Because they were chronic injuries almost 30 years old and because we were transplanting very little cells and partially because it was thoracic spinal cord and the cells don't go far enough to have an impact. In our last study, we finished recruiting for which we are still following was acute spinal cord injury. And we achieved remarkable recovery of function in 66% of our patients who recovered 2 levels of functions. Which meant they went from shrugging their shoulders to using their hands. And that's a life-changing experience. So our lab study has been extremely satisfying. I've also recently established a basic science laboratory studying stem cell biology for spinal cord injury and we are aggressively and actively looking for the next step on how we can make it better.

5. **What do you think is holding back the progression, of spreading this treatment globally basically and do you think there is a particular obstacle in getting this through?**

I think the obstacles are several folds. One is that it is such an incredibly complicated problem that you have to figure out how we can attack it successfully is really hard. You basically have two arms. An inflammatory arm and then a regenerative arm. And sometimes when you decrease inflammation you get a beneficial effect. And sometimes you get the deleterious effects. And there are many problems that have a functional effect. So that's the scientific problem and then there are governing problems, where our regulations are so strict both on stem cells and human research that it is painfully slow to do research. But it was also very important because these cells can create tumors and these cells can harm the patient by doing the surgery. So obviously have to be very careful. The barriers are substantial.

6. **You've been awarded the Kambin Foundation Award for your contribution to the minimally invasive spine surgery. How do you think that you have changed the face of spinal surgery now?**

So certainly, in the United States, many of the minimally invasive procedures that we have developed our standard of care. For example, minimally invasive TLIF is one of the most commonly performed procedures.

Where basically you replaced an open TLIF. I have not done a laminectomy for lumbar stenosis since 1993. And the procedures that we have for it now are vastly better where I can't imagine doing a laminectomy anymore. It's not even comprehensible to me now. I think we are moving the needle and we are moving towards the point where virtually all spinal procedures will be done minimally invasively. For example, I do all my scoliosis minimally invasively now. It's had a monstrous impact on recovery and complications so I really think we have moved the needle now.

7. **Do you think in residency training programs you should be taught minimally invasive procedures instead of the old school ones or they should do a separate fellowship/training for minimally invasive operations?**

It all depends on the faculty at your institutions. For example, at Rush University we have five dedicated spine surgeons 4 of them do minimally invasive spine surgery. A resident here does not need to do a fellowship for minimally invasive separately. But, you really do need a fellowship because it takes yearlong to learn the techniques for minimally invasive.

8. **Do you consider that the worldwide management and guidelines in spine surgery are useful at this stage? Do you think there should be a uniformity of guidelines?**

A uniformity of guidelines is good in one aspect because it gives you a level of where you should be at. A technique or skill level set that would be beneficial to your patients. All the places in the world don't have similar resources. So it shouldn't ever be used as a judgment or a punishment if you don't do minimally invasive yet. Yet it should be giving you something to shoot for to improve your spine technique.

9. **What advice would you give to a young neurosurgeon who's interested in spine surgery?**

Specifically, advice regarding spine surgery is to jump into it and do as much of it as you can and in many ways spine surgery is harder than many of the procedures we do in neurosurgery.

With the exception of, an open basilar tip or a very complicated aneurysm at the bifurcation of the carotid artery or something like that. And you are also judged much more harshly on your results. If I'm doing an aneurysm and the patients dies, well that was much more expected. But if I'm doing a complicated spine surgery and the patient doesn't come out with no pain then somehow I failed. So if you're interested in spine surgery you really got to jump in there and do as much of it as you can. And you got to be willing to learn for the rest of your life, because our techniques are changing so rapidly that if you stop learning you become outdated very quickly.

**10. Now that you have given some advice on spine surgery, so what about someone that is interested in stem cell research? Or a young neurosurgeon would like to get involved what advice would you give them?**

If you really want to get into the basic science side of it, you're going have to take some time off and get into the laboratory. Maybe one to two years to get enough background to be able to establish your own research laboratory. Trying to do basic research in the early years of establishing your practice is extremely difficult. Because they are both 150% of your time. And you need a family life on top of that. It's really hard.

**11. How do you balance your priorities and your clinical work, research work and family life? How do you deal with it?**

Well, when I first started after doing my Ph.D. and then getting into medicine, I took my first job I did not do any basic research. I only did stem cell research. In recent years, I have established my laboratory. Part of it is because my children are grown and out of the house. But when I started out my rule was that even when I was working long hours, when I came home, I was theirs. It was my children's and my wife's time. And I did not go back to work until they were all in bed.

**12. So recently, Prof Salman Sharif told me that you spoke to him and you told him that there is a new game changer you are working on. Do you want to shed some light on that?**

Sure. About 10 years ago I established my own company. It's an intellectual property generating company.

I invent things and I patent them and take them to various levels of development and sell them. I think the game-changer that you will be seeing fairly soon, within a year or two years is the three lumbar stabilization systems that do not rely on rods. They are completely rod-less stabilization systems. The cool thing is that they can all be done minimally invasively and because there is no rod it is very inexpensive to manufacture. So this will be good for developing countries that can't afford seven thousand dollar constructs for every patient because these will be pennies on the dollar. I think not only for the United States market but for the international market these will be real game-changers. You only need three trays of instruments. Only a handful of instruments to put them in.

**13. Let's talk about you a little bit. What do you do for relaxing or get time off, if you get time off?**

I enjoy golfing. I exercise virtually every day. I'm an avid reader. I like to collect antiquities. I like white water rafting and snowboarding. And I like bird watching. I have two ways to relax. One of the things I've done for 30 years is that I've got an inground Jacuzzi at home and before I go to bed virtually every night whether its summer or winter, 30 degrees below zero. I like to get in my Jacuzzi and I sleep very well. And for me, a perfect Saturday or Sunday morning is like to sit on my kitchen table with a cup of coffee listening to classical music watching all the birds eating from my bird feeders.

**14. Can you tell me a little bit about your family?**

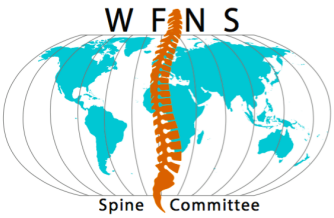
Yeah, so I have three children. My wife's original career was opera, she was an opera singer and she, later on, did an MBA in business and just recently published her first book. She's quite a multi-talented woman. My eldest daughter is also an opera singer and then decided she needed to make money, so she's now a nurse practitioner living and practicing in Houston. My son followed the same pathway as I did, he did his Ph.D. in neurosciences. And then went to medical school. He's now a third-year resident in my program. My youngest is an artist living in LA.

**15. Can you tell us about the WFNS spine committee and the progress, they have made?**

The progress they have made for example in the last three years is phenomenal. From sponsoring courses all over the world to collaborating with other societies to sponsor additional courses. They've got a great newsletter. They are putting out guidelines they've been extremely active. It's a great group of guys putting out some really good stuff.

**16. Is there any particular question you think I should be asking you or that I've missed out on?**

No. I think the only thing is that I would encourage our young neurosurgeons to stay up to date and continuing their learning. Neurosurgery is still advancing so rapidly and it's so encouraging. And I suggest anybody go into neurosurgery. It's been a great career for me and I would do it all over again.




# All Things Considered

by B Roitberg, C Kim

## *Perioperative pain management in spine surgery – the proper role of opioids.*

Pain control after spine operations is an important topic and involves unique aspects compared to many other types of surgery. A review of 179 surgical procedures has rated spinal surgeries among the top six procedures causing highest degree of postsurgical pain (Gerbershagen et al 2013). The operations are sometimes extensive and thus painful, especially for the first several days post op. Muscle dissection and bone pain produce separate types of painful stimuli that may persist for days and often weeks after the operation. Control of pain is important after any operation, but the need for early mobilization is clear and especially pertinent for spine operations. For example, spine operations carry an elevated risk of venous thromboembolism. Patients often refuse mobilization or therapy if their pain is uncontrolled. Adequate pain management in post-operative period is correlated with improved functional outcome, decreased respiratory complications, early ambulation, early discharge, and preventing chronic pain. (Kurd et all 2017).

In the US, and in other countries, we have gone through an evolution of the thinking about opioid prescriptions. An enthusiasm for more complete pain control and increased prescriptions were prevalent 10-15 years ago, and have been replaced by a pressure by legislators, payers and institutions to cut opioid prescriptions. The current trend of continuous pressure to cut opioids is swinging the pendulum far in the direction of reducing opioid prescriptions. Some insurance companies are demanding pre-approval for postoperative oral opioids. Some institutions want to see prescriptions numbers by each doctor to decrease every year.

We must acknowledge that the abuse of prescription opioids and overdoses are a serious public health issue. The "opioid epidemic" has been called the "most consequential preventable public health problem in the United States."

Though there is wide recognition of the role of prescription opioids in the epidemic, evidence has shown that heroin and synthetic opioids contribute to most opioid overdose deaths. It is essential to reframe the preventive strategies in place against the opioid crisis with attention to factors surrounding the illicit use of fentanyl and heroin. Data on opioid overdose deaths shows 42,000 deaths in 2016 in the US. Of these, synthetic opioids other than methadone were responsible for over 20,000, heroin for over 15,000, and natural and semi-synthetic opioids other than methadone responsible for over 14,000. (Manchikanti et al 2018)

Opioids have been used extensively for postoperative pain control, with excellent efficacy and safety. However, there is scarce data, if any on correct dose/duration. Data – based rational approach to opioid prescription for the perioperative period is important but appears to be lacking. After joint and spine surgery, many patients reported unused opioids, infrequent use of analgesic alternatives, and lack of knowledge regarding safe opioid storage and disposal. Interventions are needed to better tailor postoperative analgesia and improve the safe storage and disposal of prescription opioids (Bicket et al 2019).

After spine surgery, nearly all patients had discontinued opioid use by 6 months following discharge. As only 0.1% of the patients continued opioid use at 6 months following surgery, these results indicate that spine surgery among opioid-naive patients is not a major driver of long-term prescription opioid use. Socioeconomic status and pre-existing mental health disorders may be factors associated with sustained opioid use following spine surgery (Schoenfeld et al 2017).

Many patients had chronic or prolonged pain before they were referred for an operation. Such patients are a separate population, with different management considerations compared to the general or opioid-naïve population. Patients treated with chronic opioids prior to spine surgery are significantly less likely to achieve meaningful improvements at 1-year in pain, function, and quality of life; and less likely to be satisfied at 1-year with higher odds of 90-day complications, regardless of dosage.

Both preoperative chronic opioid therapy and high-preoperative dosage are independently associated with postoperative chronic opioid use. (Oleisky et al 2019). Another study tested for an association between MED values prescribed at discharge and sustained opioid use after lumbar spine surgery. In addition to previously reported risk factors, discharge prescription dose exceeding 120 mg/day is independently associated with opioid dependence following spine surgery (Wright et al 2019).

Increased preoperative opioid consumption, Modified Somatic Perception Questionnaire score, and Zung Depression Scale score prior to undergoing spine surgery predicted worse patient-reported outcomes. This suggests the potential benefit of psychological and opioid screening with a multidisciplinary approach that includes weaning of opioid use in the preoperative period and close opioid monitoring postoperatively. (Lee et al 2014)

Some oversight over prescription opioids has been effective. A comprehensive program to eliminate the over-prescription of opioids decreased the amount of opioid prescribed by half, without a concurrent increase in opioid refills, demonstrating that simple measures can be used to deliver sustained and reproducible improvements in offering source control in the opioid epidemic (Chiu et al 2019). In another study, implementation of mandatory opioid prescribing limits effectively decreased 30-day postoperative opioid utilization following ACDF without a rebound increase in prescription refills, ED visits, unplanned hospital readmissions, or reoperations for pain (Reid et al, 2019).

However, this data does not prove that continues decreases in prescribed dose and duration will have the same net beneficial result. Pain control after spine surgery is rarely a source of addiction; therefore our policies should be guided by a careful balance of risks and benefits and by rational use of all available strategies for pain control.

To optimize postoperative pain control, we should make extensive use of non-pharmacological and non-opioid pharmacological methods to control pain.

Available methods include: Regional blocks, local anesthetics in injectable or cream forms, cold packs, music and art therapy, acupuncture, hypnosis, social interaction, electrical stimulators… meds like Toradol, IV acetaminophen and Ketamine for extreme cases. Most non-opioid interventions only produced mild analgesic effects, suggesting a multimodal approach is necessary to achieve optimal pain control after spine surgery. Regional techniques and NSAIDs were effective but because of their risks, their usage should be discussed with the surgical team. (Alboog et al 2019). Administering a selective COX-2 inhibitor and GABA-analogue preoperatively can significantly decrease 24-hour postoperative opioid consumption, VAS pain scores, and elapsed time to postoperative mobility in patients undergoing elective spine fusion surgery of ≤5 levels. Optimal standardized dosing and drug combination for preoperative multimodal analgesia remains to be elucidated (Haffner et al 2019).

Postoperative pain management in spine surgery is maximized if perioperative painful stimuli can be inhibited, which requires adequate blood levels of analgesic, anti-inflammatory, and neuropathic drugs intraoperatively. The employed strategy of preoperative administration of balanced analgesia resulted in lesser pain intensity, allowed better ambulation tolerance, improved functional outcomes and has also reduced the requirement of opioids and duration of hospital stay with no additional complications. Thus, this balanced analgesia administered preoperatively would address the complicated postsurgical pain (Raja et al 2019).

Opioid use should be performed according to best available evidence, in consultation with pain specialists whenever available. Reasonable doses should be prescribed, and balance of risks and benefits established for the use of opioids. Balance is a key factor. Patient education, risk screening, multimodal care and individualized care should be considered when possible.

This brief review does not aim to make specific prescriptive recommendations, but we believe that guidelines for the use of opioids should be locally established, with certain limits placed on the constant drive to lower their use.

One possible guideline: For patients admitted after surgical procedures, post-discharge opioid use is best predicted by usage the day before discharge. Use of this guideline could decrease opioid prescriptions substantially and effectively treat patients' pain. (Hill et al, 2018). A sizeable proportion of postoperative patients reported using no or few opioids following discharge (Thiels et al, 2018). Thus, guidelines can be developed to minimize opioid prescribing rationally, and identify patients requiring low doses or additional multimodal pain control.

Patients with chronic pain and prior chronic opioid use are a separate population, who should be managed together with pain specialists to offer multimodality management, preoperative weaning of opioids and psychological support.

**Conclusions:**

Pain control after spine surgery is both challenging and important for patient outcomes. Clear guidelines are lacking, and we are facing an opioid abuse and overdose epidemic that complicates medical decision-making related to perioperative pain management. Opioids continue to be effective and safe for most of our patients, their reasonable perioperative use is very rarely the cause of opioid addiction and abuse. Proper control and rational limits to opioid prescription, use of multimodality pain control methods, and consulting pain specialists are all important methods to achieve a combination of pain control and safe prescribing.

I believe that the Spine Committee should engage in a consensus process regarding the Spine Surgeons' position in this regard. A well-described theoretical and consensual framework would be the backdrop against which targeted interventions or policies may be developed.

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# Journal Club

by D'jamel Kitumba, Oscar L Alves

## *Indirect decompression in spinal surgery*

Hiroyuki Yoshihara, Journal of Clinical Neuroscience 44 (2017) 63-68

Indirect decompression is an appealing concept. It can decompress the neural structures without removing the compressive elements, thus reducing the decompressive surgery –related complications. Some of these complications, such as nerve root injury or epidural hematomas, will negatively impact on the overall outcome.

In recent years, in parallel with the development of sagittal balance concepts, indirect decompression gained momentum in spinal surgery. However, indirect decompression is an old concept. Performing an anterior discectomy and fusion (ACDF) is an effective method to decompress a cervical nerve root by increasing foraminal height. It is an indirect technique since it is virtually impossible to directly decompress the full length of the nerve root by this approach, unless vertebral artery is mobilized to expose it. Many other interbody devices, such as LLIF, may also increase bilateral foraminal height.

However, when it comes to central stenosis, especially lumbar, indirect decompression fully relies on ligamentotaxis. This outcome is always much more effective in increasing segment height than canal diameter, especially when facets joints are sclerotic or ligaments are calcified. There is an evident trade-off between ligamentotaxis and risk of subsidence, since higher cages show a higher rate of subsidence.

Ligamentotaxis is also possible to obtain with posterior elements based hardware, for example lateral mass or pedicle screws, in different clinical setting. Other devices, used *ad nauseum* to indirectly decompress, such as interspinous process devices, may actually induce kyphosis due to a longer lever arm to the segment center of rotation. Most of these devices are inserted with a fashionable minimally invasive (MIS) technique, appealing both to surgeons and patients, especially those with co-morbidities and/or older age.

Compared with direct decompression alone, indirect decompression offers the bonus of spinal fusion, but it can really be useful for degenerative stenotic patients? What is the critical canal diameter that can be solved by stretching disc bulging and hypertrophic ligaments to result in a sustainable neurological improvement? A volumetric spinal canal diameter study like this has never been done.

Additionally, indirect decompression interbody devices may also offer a gain on segmental and global lordosis, but how much of this is needed in 1-2 levels degenerative imbalances remains to be proved. However, it has to be acknowledge that ligamentotaxis produces better clinical results when lordosis is obtained, as it is the case in cervical spine, due to the posterior displacement of the spinal cord.

Driven by industry and attractive reimbursement from rather quick operations, MIS indirect decompression has been probably overused, and we may be left in the future with many complications and failures of the concept, whose revision strategies are not easy to plan.

Nevertheless, the author present a very elegant review of indirect decompression techniques and concepts, and the rational behind the clinical outcome, that may impact in spinal surgery practice.

# WFNS's Spine Committee Recommendations

During the last two years, WFNS Spine Committee has started a new activity. It was the recommendations of the most common spinal disorders. Many committee members spent long times to search for the last 10 years publications on special topics and prepared statements to guide the neurosurgeons worldwide. We organized a consensus meeting in that each speaker had the task to create questions, find answers to those questions and make statements of recommendation. Statements were voted by the committee members using Delphi method and approved statements were declared as recommendations of the WFNS Spine Committee.

The first recommendations were on "Cervical Spondylotic Myelopathy and OPLL". They were published in a special issue of the Neurospine Journal. There were 5 papers:

(1) Techniques for diagnosis and natural course,

(2) Values of surgery and nonsurgical approaches for CSM,

(3) Anterior surgical techniques for CSM,

(4) Posterior surgical techniques for CSM,

(5) Outcome measures and variables affecting prognosis of CSM.

Following is a summary of the "**Cervical Spondylotic Myelopathy and OPLL**" recommendations:

Natural course of CSM was examined in 4 different groups:

(1) Moderate to severe CSM patients (modified Japanese Orthopedic Association scale [mJOA] scores less than 13),

(2) Mild CSM patients (mJOA scores between 13-170),

(3) Patients with myelopathy signs but no symptoms,

(4) Patients with no symptoms having significant stenosis (premyelopathic).

Diagnostic tests for CSM are reviewed in 2 parts: electrophysiological tests and radiologic imaging. Value of surgery and nonsurgical approaches for CSM is another discussion. Especially decision for surgery or nonsurgical therapies is not well established for mild CSM, although there is a general consensus for surgery in moderate to severe CSM patients.

In different geographic locations of the world, the treatment options may also change according to the available resources and local practices. The indications for surgery include persistent or recurrent radiculopathy nonresponsive to conservative treatment, progressive neurological deficit, static neurological deficit with severe radicular pain when associated with confirmatory imaging and clinical-radiological correlation.

Regarding anterior surgical techniques for CSM has complication rate of anterior surgeries for CSM varies from 1.6% to 31.3% and most are approach related or graft and fusion related complications. Improvement after anterior surgery for CSM has been reported in 70% to 80% of patients. Posterior surgical techniques for CSM consist of laminectomy alone, laminectomy with fusion and laminoplasty. Posterior surgery is used in cases with significant posterior compression at 1 or 2 levels and if there are 3 or more levels anterior compressions.

In comparing laminectomy to laminoplasty, there is a trend towards laminoplasty being better than traditional laminectomy but relatively equivalent to newer techniques of minimally invasive skip laminectomies. Ideal outcome scale for CSM is the mJOA which is validated by many studies and has been adapted to be used by almost every country and nation. Three clinical variables that affect the outcomes are age, duration of symptoms and severity of the myelopathy.

The predictive variables affecting the outcomes among examination findings are hand atrophy, leg spasticity, clonus and Babinski's sign.

Among the radiological variables, the curvature of the cervical spine is the most important predictor of prognosis. Patients with instability are expected to have a poor surgical outcome. Spinal cord compression ratio and high signal intensity on T2 weighted magnetic resonance images are negative predictors for prognosis.

After "Cervical Spondylotic Myelopathy", "Lumbar Spinal Stenosis", "Cervical Spine Trauma" and "Spinal Cord Injury" recommendations were finished. All of them can be seen and downloaded on the web page http://wfns-spine.org/recommendations.

We are about to publish "Lumbar Spinal Stenosis" recommendations in a special issue of the World

# WFNS Spine Committee's WEBINARS

Webinars are new form of communication in which it is easy to communicate with the help of web and it is an easy way of communicating having seminar via using World Wide Web.

WFNS spine committee in the leadership of Mehmet Zileli, decided to start webinars for the spinal surgeons worldwide including orthopedic surgeons. It is to spread the knowledge of important topics via expert spinal surgeons who excel in his field, conducted various webinars.

If you want to listen to these webinars just click on the topic and click on the link before and you will be able to access it. Webinars variable to ask questions and get answers from experts.

## Webinar 1

**December 21, 2018:** Maurizio Fornari, Francesco Costa

**Posterior Vertebrectomy for Anterior Column Restoration in Spinal Trauma and Metastatic Tumors**

https://www.youtube.com/watch?v=c7rGAMYejTE


## Webinar 2

**January 30, 2019**: Oscar L Alves

**Surgery around V2 segment of vertebral artery: Tips and Tricks**

https://www.youtube.com/watch?v=KNc7QwM3tCA


## Webinar 3

**February 27, 2019:** Wilco C. Peul

**Degenerative Spine Surgery: What is the Evidence**

https://www.youtube.com/watch?v=Z47bMjhAkEQ


## Webinar 4

**April 24, 2019:** Muhammad Tariq Imtiaz

**Intraoperative Monitoring During Spine Surgery**

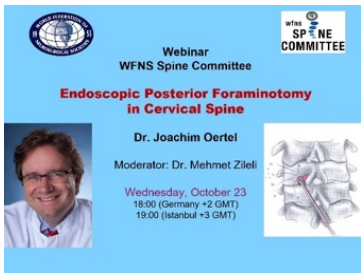
https://www.youtube.com/watch?v=nl_zXik2Geg


## Webinar 5

**October 23, 2019:** Joachim Oertel

**Endoscopic Posterior Foraminotomy in Cervical Spine**

https://www.youtube.com/watch?v=hXB-D6xgUxs




## Webinar 6

**January 15, 2020:** Onur Yaman

**Planning for Deformity Surgery: Use of Surgimap**

https://www.youtube.com/watch?v=beEozDpM2rw