

SMISS Annual Forum '22
September 29–October 1, 2022
The Bellagio, Las Vegas, NV
Scientific Program

Thursday, September 29, 2022

Session 1: Lateral Access Surgery & Lagers (Sponsored by SOLAS) Raphael Ballroom

Not CME-Accredited

5:00 pm Welcome P. Mummaneni, MD

Part 1: From Revolution to Evolution: The Lateral Approach Toolbelt

Mods: M. Steinmetz, MD & J. Sembrano, MD

5:05 pm Case presentation: L4/5 spondylolisthesis with stenosis
(vessel near psoas on imaging) J. Sembrano, MD

5:08 pm Tranpsoas (video) J. Uribe, MD

5:13 pm Ante-psoas (video) R. Lehman, MD

5:18 pm Shallow docking (video) H. Bae, MD

5:23 pm Prone lateral (video) L. Pimenta, MD

5:28 pm Advantages and disadvantages of each &
what the data supports V. Deviren, MD

5:36 pm Q & A

5:46 pm When I use standalone, and when I don't B. Ozgur, MD

5:53 pm Navigation & monitoring advances that have made
lateral faster/safer J. Ashgar, MD

6:00 pm Advances in interbody cage design and function:
How implants have evolved to improve outcomes F. Phillips, MD

6:07 pm Are we still evolving? What's next? L. Pimenta, MD

6:14 pm Q & A

6:20 pm Tech Update: Novel Surgical Guidance for Posterior
Screw Insertion During Single-Position Lumbar
Interbody Fusion S. Menachem, MD
Supported by: VUZE Medical

6:26 pm Tech Update: Utilizing Viseon MaxView™ as Enabling
Technology for Prone Lateral Surgery and Beyond P. Louie, MD
Supported by: Viseon

6:32 pm Q & A

Part 2: Controversial Utilization of LLIF

Mods: A. Kanter, MD & R. Eastlack, MD

6:40 pm	Case presentation	D. Hafez, MD
6:42 pm	LLIF for pseudarthrosis & broken rod in deformity	D. Okonwko, MD
6:49 pm	Q & A	
6:52 pm	Case presentation	E. Lord, MD
6:54 pm	LLIF for ASD above previous fusion	B. Kwon, MD
7:01 pm	Q & A	
7:04 pm	Case presentation	N. Agarwal, MD
7:06 pm	LLIF & ACR for flat back	S. Ryu, MD
7:13 pm	Q & A	
7:16 pm	Case presentation	C. Walker, MD
7:18 pm	LLIF for hi-grade spondys	J. Uribe, MD
7:25 pm	Q & A	
7:30 pm	Lateral Access Pioneer Award Supported by: NuVasive	
7:35 pm	Adjourn	

Friday, September 30, 2022

7:30 am– 8:30 am	Corporate Workshops with Breakfast <i>Not CME-accredited</i>	
7:30 am	Cross-Fire Debate: Strategies for Post-Op Pain Management Following Minimally Invasive Spine Surgery Mod: J. Gonzales, MD, MA Panelists: P. Mummaneni, MD; R. Teames, BSN, MD; M. Wang, MD, FACS	Tower Ballroom 1 Supported by: Pacira Biosciences
7:30 am	MIS+ Navigated Prone Lateral: Our Experience with 250 Levels W. Hotchkiss, MD	Tower Ballroom 3 Supported by: Medtronic
7:30 am	Minimally Invasive Lateral Single Position Surgery Featuring the Potential Benefits of ExcelsiusGPS® N. Kazemi, MD, FACS	Tower Ballroom 2 Supported by: Globus Medical

Session 2: MIS Complication Management & Revision Strategies

DaVinci Ballroom

Mods: A. Vivas, MD & A. Kanter, MD

8:30 am	Welcome	A. Kanter, MD
8:35 am	Durotomy through a tube during a redo MCD: How I fix it	J. Heller, MD
8:43 am	Lateral cage migration with new radic: How I fix it	P. Alikhani, MD
8:51 am	ALIF to address pseudarthrosis after TLIF: Tips & tricks	D. Blaskiewicz, MD
8:59 am	MIS deformity correction alignment goals not achieved: What next?	I. Lieberman, MD
9:06 am	Q & A	
9:13 am	Arthroplasty revision: How to get it out & what to put back in	J. Chi, MD
9:20 am	MIS TLIF expandables to recreate lordosis after decompression surgery induced kyphosis	Z. Ray, MD
9:27 am	Augmented reality for MIS screw placement when anatomic landmarks are gone	R. Louis, MD
9:34 am	When I open things up after failed MIS surgery, this is what I usually find...	C. Ames, MD
9:40 am	Q & A	

Challenging Cases

Mods: A. Chan, MD

9:50 am	MIS lateral for calcified central thoracic disc with myelopathy	M. Perez-Cruet, MD
9:57 am	Getting elite athletes back on the field with MIS techniques	L. Tumialan, MD
10:04 am	MIS in the elderly: Beware of the red flags	A. Clark, MD
10:11 am	Panel discussion	
10:15 am	MIS for Spondylolysis Repair	I. Lieberman, MD
10:17 am	MIS percutaneous instrumentation without arthrodesis in trauma	J. McGowan, MD
10:25 am	MIS treatment of fractional curve only in deformity	P. Mummaneni, MD
10:32 am	Panel discussion	
10:40 am	Refreshment Break with Exhibits	Tower Ballroom 4-8

Concurrent Sessions 3–5

11:20 am **Concurrent Session 3: Free Papers 1–12** **Raphael Ballroom**

Mods: L. Tan, MD; B. Pennicooke, MD

- 11:20 Paper 2: Intraoperative Methylprednisolone Reduced ODI but Not VAS: Results from the ROIDs Trial
TJ Florence, MD PhD; Daniel C. Lu, MD, PhD
- 11:24 Paper 3: Association Between Muscle Health and Patient-Reported Outcomes After Lumbar Microdiscectomy
Junho Song; Kasra Araghi; Marcel Dupont; Pratyush Shahi; Patawut Bovonratwet; Daniel Shinn; Sidhant Dalal; Evan Sheha; James Dowdell; Sohrab Virk, MD; Sravisht Iyer; Sheeraz Qureshi
- 11:28 Discussion
- 11:32 Paper 4: What Factors Drive Delayed Deterioration of Oswestry Disability Index Following Minimally Invasive Surgery for Adult Spinal Deformity?
Andrew K. Chan, MD; Dean Chou; Robert K. Eastlack; Richard Fessler; Khoi D. Than; Kai-Ming Fu; Paul Park; Michael Y. Wang, MD, FACS; Adam S. Kanter; David O. Okonkwo; Pierce D. Nunley; Neel Anand; Juan Uribe; Jay Turner; Gregory Mundis; Peter Passias; Shay Bess; Christopher Shaffrey; Saman Shabani; Vivian Le, MPH; Praveen Mummaneni
- 11:36 Paper 5: Pre-operative Predictors of Distal Failure Following Minimally Invasive Deformity Surgery with Sparing of the Lumbosacral Junction
Joseph Didomenico; James Zhou; S. Harrison Farber, MD; Joseph Abbatematteo; Timothy Gooldy; Juan Uribe; Jay Turner
- 11:40 Paper 6: Outcomes and Complications After Anterior Lumbar Interbody Fusion with Percutaneous Pedicle Screws for Grade II/III Isthmic Spondylolisthesis
Mauro Tavares Junior, MD; Andre Jakoi, MD; Peter Derman, MD, MBA; Joshua Bunch; Jake Kreck; Brandon B. Carlson, MD, MPH
- 11:44 Discussion
- 11:48 Paper 7: The Incidence of Complications and Neurological Deficits in Split Tubular, Endoscopic and Robotic-assisted Endoscopic TLIFs: There is a Difference
Michael Gerling, MD; Melissa Baker; Evan Chaladoff; Zorica Buser, PhD MBA
- 11:52 Paper 8: Two-Year Outcomes of Full-endoscopic Versus Open Discectomy for Sciatica
Pravesh S. Gadjradj; Biswadjiyet Sanjay Harhangi, MD, PhD

- 11:56 Paper 9: Robotics Reduces Radiation Exposure in Minimally Invasive Lumbar Fusion Compared To Navigation
Pratyush Shahi; Avani Vaishnav; Kasra Araghi; Daniel Shinn; Junho Song; Sidhant Dalal; Dimitra Melissaridou; Eric Mai; Marcel Dupont; Evan Sheha; James Dowdell; Sravisht Iyer; Sheeraz Qureshi
- 12:00 Discussion
- 12:04 Paper 10: Incidence of Radiographic and Clinically Significant Pneumothorax after Minimally Invasive Lateral Retropleural Approach for Thoracic Disc Herniation: Consecutive Case Series
Nima Alan; S. Harrison Farber, MD; James Zhou; Steve S. Cho, MD, MS; Luke O'Neil; Robert K. Dugan; Kate L. Petty; Laura Snyder; Jay Turner; Juan Uribe
- 12:08 Paper 11: Early Compensatory Segmental Angle Changes at L3–4 and L4–5 Following a L5–S1 Anterior Versus Transforaminal Lumbar Interbody Fusion
Bailey O'Connor; Gina Canlas; Caroline Drolet; Jesse Shen; Venu Nemani; Jean-Christophe Leveque; Rajiv Sethi; Philip K. Louie
- 12:12 Paper 12: 7-year Patient-reported Outcomes (PRO) After Lumbar Total Disc Replacement: A Post Hoc Analysis of a Prospective Clinical Trial with 7-year Follow-up
Jack Zigler; Domagoj Coric; Peter B. Derman, MD, MBA; Ernest E. E Braxton, MD; Kris Radcliff; Glen Buttermann; Anton Jorgensen; Aaron Situ; Nicole Ferko; Leena Patel
- 12:16 Paper 1: Comparison of Reimbursement Rates Between Anterior Lumbar Interbody Fusion and Lumbar Disc Replacement from 2007 to 2022
Vincent Federico; Athan Zavras; Alexander J. Butler, MD; Michael Nolte; Mohammed Munim; Samy Gabriel; Augustus Rush; Matthew Colman, MD; Frank Phillips, MD
- 12:20 Discussion

11:20 am

Concurrent Session 4: Free Papers 13–24

DaVinci Ballroom

Mods: C. Walker, MD, K. Than, MD

- 11:20 Paper 13: Single Position Transpsoas Corpectomy and Posterior Instrumentation in the Thoracolumbar Spine for Different Clinical Scenarios
Alfredo J. Guiroy; Jahangir Asghar; Ashish Patel; Alex Thomas; Michael Rogers; Gaston Camino-Willhuber; Justin Seale; Cristiano Menezes; William Smith; Gergely Bodon
- 11:24 Paper 14: Cervical Disc Arthroplasty and Range of Motion at 7-years: Impact on Adjacent Level Degeneration
Alexander M. Satin, MD; Mary P. Rogers-LaVanne, PhD; Peter B. Derman, MD, MBA

- 11:28 Paper 15: Multimodal Analgesic Protocol for Cervical Disc Replacement in the Ambulatory Setting: Clinical Case Series
Michael C. Prabhu, BS; James W. Nie, BS; Timothy J. Hartman, BS; Kevin C. Jacob, BS; Madhav R. Patel, BS; Keith R. MacGregor, BS; Omolabake O. Oyetayo, BS; Eileen Zheng, BS; Kern Singh, MD
- 11:32 Discussion
- 11:36 Paper 16: Proximal Adjacent Segment Disease Over Ten Years After Lateral Lumbar Interbody Fusion
Molly Monsour, BS; Elliot Pressman, MD; Deborah Liaw, BS; Puya Alikhani, MD
- 11:40 Paper 17: Oblique Lateral Interbody Fusion at L5-S1: Feasibility, Surgical Approach Window, Incision Line, and Influencing Factors
Jacob Razzouk; Shaurya Mehta; Gideon Harianja; Omar Ramos; Nathaniel Wycliffe; Olumide Danisa; Wayne Cheng
- 11:44 Paper 18: Patient-centered Outcomes Following Prone Lateral Single-Position Approach to Same-Day Circumferential Spine Surgery
Peter Passias; Tyler Williamson; Oscar Krol; Rachel Joujon-Roche; Bailey Imbo; Peter Tretiakov; Jamshaid M. Mir; Stephane Owusu-Sarprong; Jordan Lebovic; Ekamjeet Dhillon; Kimberly McFarland; Pooja Dave; Claudia Bennett-Caso; Dean Chou; Paul Park; Praveen Mummaneni; Justin S. Smith; Shaleen Virra; Bassel Diebo
- 11:48 Discussion
- 11:52 Paper 19: Twenty-four Month Radiographic and Clinical Outcomes in Subjects with Risk Factors for Non-union that Underwent Single Level or Multi-Level Lumbar Fusion with a Cellular Bone Allograft
Pierce D. Nunley; Daniel Park, MD; Joshua Wind
- 11:56 Paper 20: Does Peri-Operative PTH Analogues in Osteoporotic Patients Help Increase Bone Density, and Decrease Mechanical Complications – Minimum 2-year Radiological Study Measuring Hounsfield Units
Neel Anand; David Gendelberg; Anita Anand; Bardia Khandehroo; Jose Jimenez Almonte; Andrew Chung; Babak Khandehroo; Sheila Kahwaty
- 12:00 Paper 21: Radiological and Clinical Outcomes Comparing 2-level MIS Lateral and MIS Transforaminal Lumbar Interbody Fusion in Degenerative Lumbar Spinal Stenosis
Elliot Y. Chong; Reuben Soh; Don Koh; lenice Tan; Christoph Chong; Jiang Lei; Guo Chang Min; Lenice Tan Yue Tong
- 12:04 Discussion

- 12:08 Paper 22: A Retrospective Review of 110 Prone Lateral Lumbar Interbody Fusion Cases: A Single Surgeon Experience
Ashish Patel; Michael Rogers; Eshan Doshi
- 12:12 Paper 23: Vascular and Visceral Complications Following Prone Transpsoas Lateral Lumbar Interbody Fusion: A Comparative Study to A Historical Survey Study on Standard Lateral Lumbar Interbody Fusion
Mohamed A. Soliman, MD, MSc, PhD; Luis Diaz-Aguilar; Rodrigo Amaral; Bryan S. Lee; Muhammad Abd-El-Barr; Gene Massey, MD; Craig McMains; David Schwartz; Gurvinder S. Deol; Andrew D. Nguyen, MD, PhD; Tyler Smith; Luiz Pimenta, MD, PhD; William Taylor, MD; John Pollina
- 12:16 Paper 24: Early Clinical Outcomes of Prone Transpsoas Lumbar Interbody Fusion Technique
Ian J. Wellington, MD; Christopher Antonacci, MD; Chirag Chaudhary, MD; Ergin Coskun, MD; Mark Cote, DPT, MSCTR; Hardeep Singh, MD; Scott Mallozzi, MD; Isaac Moss, MD, MAsc, FRCSC

12:20 Discussion

11:20 am **Concurrent Session 5: Young Surgeon Free Papers 25–36** **Tower Ballroom 1-2**

Mods: J. Laratta, MD, B. Hirsch, MD

- 11:20 Paper 25: Long-term Durability of Stand-alone Lateral Lumbar Interbody Fusion
Nitin Agarwal; Michael D. White, MD; Souvik Roy; Alp Ozpinar; Nima Alan; David O. Okonkwo; David Hamilton; Adam S. Kanter
- 11:24 Paper 26: Lateral Single Position Anterior-Posterior Lumbar Fusion Outperforms Conventional Anterior-Posterior Lumbar Fusion with Patient Repositioning at 2-year Minimum Follow-Up
Aaron J. Buckland, MBBS, FRACS; Brett Braly; Nicholas A. O'Malley, M.S.; Dylan Proctor; Kimberly Ashayeri; Brian Kwon; Ivan Cheng; Themistocles Protopsaltis; J. Alex Thomas
- 11:28 Paper 27: Implant Size and Position Affects Patient Reported Outcomes After Lateral Lumbar Interbody Fusion
Alexander J. Butler, MD; Mohammed Munim; Athan Zavras; Matthew Colman, MD; Frank Phillips, MD
- 11:32 Discussion
- 11:36 Paper 28: High-level Evidence of Posterior Minimally Invasive Scoliosis Surgery Versus the Standard Posterior Approach for the Management of Adolescent Idiopathic Scoliosis
Honghao Yang; Xiangyuan Jia; Yong Hai

- 11:40 Paper 29: Comparing 12-month Quality of Life, Work Status, and Disability Outcomes Between Decompression & Dynamic Sagittal Tether Stabilization vs Transforaminal Lumbar Interbody Fusion for the Management of Lumbar Degenerative Spondylolisthesis. Interim Results of an FDA IDE Study
Hania Shahzad, MBBS; Elizabeth Yu, MD; Nazihah Bhatti, BS; Rick Sasso; Serena Hu; Eugene Carragee, MD; Hyun Bae; Mick Perez-Cruet, MD, MS; Alan T Villavicencio, MD; Tim Yoon, MD, PhD; Kee D Kim, MD; William F Lavelle; Jeffrey L Gum, MD; Ravi S. Bains, MD; Calvin C. Kuo, MD; Harvinder S. Sandhu, MD, MBA; Michael P. Stauff, MD; Michael Y. Wang, MD, FACS; Dennis G Crandall; Sigurd H. Berven, MD; Harel Deutsch, MD; Jeffrey S. Fischgrund, MD; Wilson Z. Ray, MD; Matthew Mermer, MD; Khalid Sethi, MD; Adam L. Shimer, MD; Reginald J. Davis, MD; Jens R. Chapman, MD; Andrew P. White, MD; Richard D. Guyer, MD; Louis C. Fielding, MS; Todd F. Alamin, MD; William C. Welch, MD, FACS, FICS
- 11:44 Paper 30: Are 2-year Reoperation Rates Different for Circumferential Minimally Invasive Surgery (cMIS) vs. Open ASD Surgery? A Propensity Matched Cohort Study Using a Prospective ASD Database
Saman Shabani, MD; Andrew K. Chan, MD; Nitin Agarwal; Vivian Le, MPH; Alexander A. Abedi; Paul Park; Juan Uribe; Jay Turner; Robert K. Eastlack; Richard Fessler; Khoi D. Than; Kai-Ming Fu; Michael Y. Wang, MD, FACS; Adam S. Kanter; David O. Okonkwo; Pierce D. Nunley; Neel Anand; Gregory M. Mundis; Peter Passias; Shay Bess; Christopher Shaffrey; Dean Chou; Praveen Mummaneni
- 11:48 Discussion
- 11:52 Paper 31: Comparing Long-Term Deformity Correction and Other Outcomes Between Single Level Circumferential XLIF and MI-TLIF: A Retrospective Review With 5-Year Minimum Follow Up
Stephen Saela; Daniel Coban; Stuart Changoor; Neil Patel; Kumar Sinha; Ki Hwang; Michael Faloon; Arash Emami
- 11:56 Paper 32: A Powerful Tool to Create Lordosis, Anterior Column Release Can Come with Its Own Complications - A Case Series
Elliot Pressman, MD; Mohammad Noureldine, MD; Puya Alikhani, MD
- 12:00 Paper 33: The Anatomical Positioning of Retroperitoneal Organs in Single-Position Prone Lateral Lumbar Surgery
Yusuke Dodo; Ichiro Okano; Neil Kelly; Henryk Haffer; Maximillian Muellner; Erika Chiapparelli; Jennifer Shue; Darren Lebl, MD, MBA; Frank Cammisa, MD; Federico Girardi, MD; Alexander Hughes; Gbolabo Sokunbi, MD; Andrew Sama
- 12:04 Discussion

- 12:08 Paper 34: VR Simulation Module for Spinal Instrumentation Demonstrates Improved Procedural Confidence and Performance Dose Response in Neurosurgical Trainees: Pilot Study
Nicholas M. Laskay, MD; Matthew Parr; James Mooney; S. Harrison Farber, MD; Ryan Ehredt; Chinami Michaels; Juan Uribe; Jake Godzik
- 12:12 Paper 35: The Safety and Efficacy of Erector Spinae Plane Blocks in Minimally Invasive Spine Surgery: Modulation of Pain Scores, Opioid Requirements and Adverse Events
Joshua Woodward, MD, MCR; Samuel Meza, MD; Daniel I. Wolfson, MD; Ryan M. Kelly, MD; Mena Kerolus, MD; Mitchell Bosman, MD; Asokumar Buvanendran, MD; Andrew Platt, MD MS; Ricardo Fontes, MD PhD; Harel Deutsch, MD; Richard Fessler; Neal Mehta, MD; John O'Toole, MD
- 12:16 Paper 36: Impact of Pandemic-induced Staff Shortages and Utilization of Immediate Use Surgical Sterilization on Surgical Site Infection After Spine Surgery
Sharath Kumar Anand, MD; Nima Alan; Adam S. Kanter

12:20 Discussion

12:30 pm **Lunch in Exhibit Hall** **Tower Ballroom 4-8**

12:30 pm **Young Surgeon Lunch** **Tower Ballroom 1-2**

Mod: P. Derman, MD

12:35 Medtronic Presentation

12:45 Panel Discussion: How and When to Incorporate Minimally Invasive Techniques into Your Practice
Panelists: Drs. Iyer, Qureshi, Steinberger, Walker, & Wang

Concurrent Session 6: Go Small or Go Home -- in Deformity **Raphael Ballroom**

Mods: N. Anand, MD & K. Foley, MD

- 1:30 pm How to evaluate a deformity patient for MIS surgery: Patient-specific concerns, imaging, etc. K. Poelstra, MD
- 1:38 pm When hybrid approaches are necessary G. Mundis, MD
- 1:46 pm When & where to incorporate lateral ACR L. Khoo, MD
- 1:54 pm Performing PSO: How to do it safely through an MIS portal M. Wang, MD
- 2:02 pm Q & A
- 2:10 pm Tips to avoid PJK when crossing the junction with MIS techniques N. Anand, MD

2:18 pm	Most common MIS complications in deformity surgery: How to avoid them!	P. Nunley, MD
2:26 pm	Achieving MCID in MIS Deformity: How correction goals change with patient age	P. Park, MD
2:34 pm	Q & A	
2:40 pm	MIS fixation to the pelvis: Indications, MIS techniques & pearls, and outcomes	T. Chryssikos, MD
2:48 pm	How Intraop-navigation has improved reconciliation with pre-op plan	S. Qureshi, MD
2:56 pm	Q & A	

Concurrent Session 7: Endoscopic Spine Surgery

DaVinci Ballroom

Mods: C. Kim, MD & Luke Kim, MD

I have mastered the basics, How do I take the next step?

1:20 pm	Cervical spinal cord decompression - with video	J. Shen, MD
1:28 pm	Thoracic disc herniation - with video	M. Huang, MD
1:36 pm	Far lateral disc herniation - with video	J. Yoon, MD
1:44 pm	Discussion	
1:50 pm	Intradural tumor resection - with video	C. Hofstetter, MD
1:58 pm	Biportal laminectomy - with video	D. Park, MD
2:04 pm	Discussion	
2:12 pm	Endoscopic management of a CSF leak	J.S. Kim, MD
2:20 pm	Pearls for avoiding and managing complications during endoscopic surgery	R. Fessler, MD
2:29 pm	Making the economics work? Convince your CFO to invest in endoscopy	P. Whang, MD
2:38 pm	Are robotics and navigation the future of endoscopy?	C. Kim, MD
2:47 pm	Discussion	

3:00–3:30 pm **Refreshment Break with Exhibits**

Tower Ballroom 4–8

Session 8: Keynote Lecture & Presidential Address

DaVinci Ballroom

Mods: D. Okonkwo, MD & R. Louis, MD

3:30 pm	Introduction of Keynote Speaker	S. Qureshi, MD
3:35 pm	Special Lecture: Team leader traits that create legacies	S. Walker

4:10 pm	Traveling Fellowship Recap and Recognition	
4:15 pm	Introduction of President	J. Uribe, MD
4:20 pm	Presidential address: Mentoring: A Lifelong Pursuit to Mastery	A. Kanter, MD

Session 9: New Technologies

DaVinci Ballroom

Mods: Y. Kotani, MD & I. Moss, MD

4:35 pm	Robotics & augmented realities: Have they really improved what we do?	F. Phillips, MD
4:43 pm	Utilizing AI technology in the pre-op planning stages	S. Cho, MD
4:51 pm	How machine learning has impacted MIS surgery	J Kim, MD
4:56 pm	Discussion	
5:05 pm	Patient-specific implants and precontoured rods for advanced use	K. Than, MD
5:13 pm	Latest cervical arthroplasty advances: The future is bright	J. Beckett, MD
5:21 pm	Training our future MIS Leaders: What metrics matter?	K. Foley, MD
5:29 pm	Discussion	
5:35 pm	Adjourn	
5:35–6:35 pm	Welcome Reception in Exhibit Hall	Tower Ballroom 4–8

Saturday, October 1, 2022

7:30 am– 8:20 am	Corporate Workshop with Breakfast <i>Not CME-accredited</i>	
	Real-Time Software Overlays Tools from Intra-Op 2D X-Rays on 3D Views from Standard Pre-Op CT; No Cameras, Markers, References or Tool Modifications Speakers: J. Finkelstein, MD; O. Keynan, MD; S. Menachem, MD; G. Schiffer, MD; D. Tolkowsky, CEO	Tower Ballroom 3 Supported by: VUZE Medical

Session 10: Socioeconomics in the ASC

DaVinci Ballroom

Mods: N. Agarwal, MD & S. Iyer, MD

8:30 am	Welcome	M. Steinmetz, MD
8:35 am	Complex case presentation	A. Vivas, MD

8:38 am	Why I would comfortably do this case in an ASC setting	J. Turner, MD
8:44 am	I would only do this case in a hospital outpatient setting	R. Mayer, MD
8:50 am	How do I decide how complex of a case I can take to an ASC?	L. Khoo, MD
8:56 am	Q & A	
9:05 am	How to assemble an optimal anesthesia and surgical team in your ASC	E. Braxton, MD
9:13 am	2022 ERAS protocols -- creating and implementing	K. Madhavan, MD
9:21 am	Navigation & robotics in an ASC How do I make this work?	J. Lombardi, MD
9:29 am	Q & A	

Session 11: The Future of MIS

DaVinci Ballroom

Mods: V. Chang, MD & J. Steinberger, MD

9:40 am	Awake MIS fusion surgery: Is this ever going to become mainstream? Or just a handful of enthusiasts on the edge?	M. Wang, MD
9:50 am	Robots will not only be placing the screws, they will be deciding where they go!	G. Poulter, MD
10:00 am	Machine learning: Will we ever be able to choose the right patient, procedure and location?	M. Bydon, MD
10:10 am	The future of the spine surgeon after retirement: Keys to staying involved	K. Foley, MD
10:20 am	Working with industry in the future: Beyond widgets & gadgets	F. Phillips, MD
10:30 am	Panel discussion: The crystal ball - where will we be 10 years from now? SMISS Past & Future Presidents Panel: Drs. Kanter, Phillips, Uribe	
10:40 am	Refreshment Break with Exhibits	Tower Ballroom 4-8

Session 12: Free Papers – Lightning Round

DaVinci Ballroom

Mods: S. Shabani, MD & A. Vivas, MD

- 11:10 Paper 37: A Single Center, Randomized Control Trial of IV versus Oral Acetaminophen Perioperative to Instrumented Lumbar Fusion
Gregory K. Paschal, MS; Fedan Avrumova, BS; Philip K. Paschal, MS; Ellen Soffin, MD PhD; Joseph Nguyen, MPH; Russel C. Huang, MD; Matthew Cunningham, MD PhD; Federico Girardi, MD; Frank Cammisa, MD; Darren Lebl, MD, MBA; Celeste Abjornson, PhD
- 11:12 Paper 38: Surgeon-placed Erector Spine Paravertebral Block and continuous bupivacaine infusion for pain control after lumbar fusion
Michael Verdon, DO, FACOS
- 11: 14 Paper 39: Resolution of Back Pain Following Minimally Invasive Laminectomy
Daniel Shinn; Pratyush Shahi; Kyle Morse; Sidhant Dalal; Tejas Subramanian; Sheeraz Qureshi; Sravisht Iyer
- 11:16 Paper 40: Impact of Facet Replacement vs TLIF in a Prospective Randomized FDA Study on ODI and Post-Operative Opioid Utilization among Subjects at 24 Months
John H. Chi, MD, MPH; Micheal Steinmetz; Scott Meyer; Ahmad Nassr; Vikas Patel; Michael W. Groff; Evalina Burger; William C. Welch, MD, FACS, FICS; Domagoj Coric
- 11:18 Paper 41: Hardware Failure Over Ten Years After 574 Levels of Lateral Lumbar Interbody Fusion
Deborah Liaw, BS; Elliot Pressman, MD; Molly Monsour, BS; Puya Alikhani, MD
- 11: 20 Paper 42: Biomechanical Comparison of Unilateral and Bilateral Pedicle Screw Fixation after Multilevel Lumbar Lateral Interbody Fusion Utilizing 26 mm Cages
James M. Mok, MD, MBA; Craig Forsthoefel, MD; Roberto Leonardo Diaz, PhD; Ye Lin, MD; Farid Amirouche, PhD
- 11:22 Paper 43: Biomechanical Comparison of Stability and Anterior Column Load Sharing: Transfacet-Intralaminar Cortical Fixation versus Traditional Pedicle Screw Instrumentation after Lateral Interbody Fusion
Robert K. Eastlack; Pierce D. Nunley; Kornelis A. Poelstra, MD PhD; Iris Wu; Pierre Legay; Aakash Agarwal
- 11: 24 Paper 44: A Retrospective Study of Lumbar Circumferential Fusion: Interlaminar Fusion Stabilization versus Pedicle Screw Instrumentation
Philip K. Paschal, MS; Daniel Alicea, BS; Kevin Tang, BS; Celeste Abjornson, PhD; Frank Cammisa, MD

- 11: 26 Paper 45: The Efficiency and Accuracy of the Robotic Assistance in Pedicle Screw Placement
Peter Boucas; Adam Strigenz, BA; Shaya Shahsavarani; Rohit Verma
- 11:28 Paper 47: Minimally invasive percutaneous screw placement in thoracic and lumbar spine with optical skin marker based Augmented Reality navigation: results from a prospective study
Pietro Scarone, Dr; Caterina Mollica; Sebastian Lippross; Anindita Chatterjea - Philips; Inge Jenniskens; Andreas Seekamp
- 11:30 Paper 48: Location Variance of the Great Vessels During Positioning Changes While Undergoing DLIF
Aaron Joiner; Gilberto Gomez; Sohrab Vatsia; Tyler Ellett; Douglas Pahl
- 11:32 Paper 49: Do the 5-Year Outcomes for Minimally Invasive and Open Transforaminal Lumbar Interbody Fusion for Grade 1 Degenerative Lumbar Spondylolisthesis Differ?
Andrew K. Chan, MD; Erica Bisson; Mohamad Bydon; Steven Glassman, MD; Kevin Foley; Christopher Shaffrey; Eric Potts; Mark Shaffrey; Domagoj Coric; John Knightly; Paul Park; Michael Y. Wang, MD, FACS; Kai-Ming Fu; Jonathan Slotkin; Anthony Asher; Michael Virk; Giorgos Michalopoulos; Jian Guan; Nitin Agarwal; Dean Chou; Regis W. Haid, MD; Praveen Mummaneni
- 11:34 Paper 50: Decompression and Dynamic Sagittal Tether for Degenerative Spondylolisthesis: 24-month Pain, Disability and Reoperation Outcomes in 222 Patients from an FDA IDE Study
Hyun Bae; Rick Sasso; Serena Hu, MD; Eugene Carragee, MD; Mick Perez-Cruet, MD, MS; Alan T Villavicencio, MD; Tim Yoon, MD, PhD; Kee D Kim, MD; William F. Lavelle, MD; Jeffrey L Gum, MD; Ravi S. Bains, MD; Calvin C. Kuo, MD; Harvinder S. Sandhu, MD, MBA; Michael P. Stauff, MD; Michael Y. Wang, MD, FACS; Dennis G. Crandall, MD; Sigurd H. Berven, MD; Harel Deutsch, MD; Jeffrey S. Fischgrund, MD; Wilson Z. Ray, MD; Matthew Mermer, MD; Khalid Sethi, MD; Adam L. Shimer, MD; Reginald J. Davis, MD; Elizabeth Yu, MD; Jens R. Chapman, MD; Andrew P. White, MD; Richard D. Guyer, MD; Louis C. Fielding, MS; Todd F. Alamin, MD; William C. Welch, MD, FACS
- 11:36 Paper 51: Evaluating the incidence of subsequent surgical decompression following minimally invasive approaches to treat symptomatic lumbar spinal stenosis: A retrospective database review
Hania Shahzad, MBBS; Nasir Hussain; Nazihah Bhatti, BS; Ryan Souza; Vwaire Orhurhu; Mahmoud Abdel-Rasoul; Tristan Weaver, MD; Safdar Khan, MD, FAAOS

- 11:38 Paper 52: Biomechanical Analysis of Expandable Interbody Cage Stiffness, Force Exertion, and Subsidence in the Setting of Spondylolisthesis
Junho Song; Austen Katz, MD; Thomas Dowling; David Nuckley; Valerie S. Coldren; Josh Rubin; Liam Barnes; Jeff Silber; David Essig, MD; Sheeraz Qureshi; Sohrab Virk, MD
- 11:40 Paper 53: Clinical and radiographic outcomes of late-onset cage subsidence after minimally invasive lateral lumbar interbody fusion
Sang-Il Kim ; Yoon-Hoon Kim; Hyung-Youl Park; Hoonseok Sung; Hyungchul Park
- 11:42 Paper 54: Minimally Invasive Lumbar Decompression Versus Minimally Invasive Transforaminal Lumbar Interbody Fusion for Treatment of Low-Grade Lumbar Degenerative Spondylolisthesis
Patawut Bovonratwet; Andre Samuel; Jung Kee Mok; Avani Vaishnav; Kyle Morse, MD; Junho Song; Michael Steinhaus; Yusef Jordan; Sheeraz Qureshi
- 11:44 Paper 55: Early outcomes of multilevel ACDF with segmental plate fixation
Kody Barrett; Robert K. Eastlack; Gregory M. Mundis; Matthew Hatter; Ryan Beyer; Bahar Shahidi; Fernando Rios; Courtney Molzen; James Bruffey; Hani Malone, MD
- 11:46 Paper 56: Impact of Age Within Younger Populations on Outcomes Following Cervical Surgery in the Ambulatory Setting
Timothy J. Hartman, BS; James W. Nie; Hanna Pawlowski, BS; Michael C. Prabhu, BS; Nisheka N. Vanjani, BS; Keith R. MacGregor; Kern Singh, MD
- 11:48 Paper 57: Anterior Vertebral Body Tethering Has Reduced Pain and Improved Function for the First 6 Weeks after Surgery Compared to Fusion
Jennifer M. O'Donnell, MD; Alex Gornitzky; Hao-Hua Wu; Kira Furie; Mohammad Diab
- 11:50 Paper 58: Clinical and radiographic results after proximal lumbar anterior column realignment in patients with adult spinal deformity
Timothy Y. Wang; Jason Frerich; Khoi D. Than
- 11:52 Paper 59: Does the Severity of Facet Arthropathy Limit the Sagittal Re-alignment in Circumferential Minimally Invasive Surgical (CMIS) Correction of Adult Spinal Deformity (ASD)?
Neel Anand; Andrew Chung; Anita Anand; Bardia Khandehroo; Jose Jimenez Almonte; David Gendelberg,; Babak Khandehroo ; Sheila Kahwaty

- 11:54 Paper 60: Circumferential Minimally-Invasive Adult Spinal Deformity Surgery Provides Incremental Benefit for Increasingly Frail Patients
Peter Passias; Peter Tretiakov; Rachel Joujon-Roche; Tyler Williamson; Oscar Krol; Bailey Imbo; Nima Alan; Pierce D. Nunley; Paul Park; Robert K. Eastlack; Gregory Mundis; Dean Chou; Juan Uribe; Neel Anand; Khoi D. Than; Saman Shabani; Breton Line; Christopher Ames; Justin S. Smith; Christopher Shaffrey; Robert Hart; Douglas Burton; Renaud Lafage; Frank Schwab; Shay Bess; Praveen Mummaneni; Michael Wang; Adam Kanter; David O. Okonkwo; Nitin Agarwal; Andrew Chan; Richard Fessler; Gregory Brusko; Sumedh Shah; Kai-Ming Fu
- 11:56 Paper 61: Sacroiliac Joint Fusion Navigation: How Accurate is Pin Placement?
Shea Comadoll, MD; Jason Haselhuhn, DO; David Polly, MD; Jonathan Sembrano, MD; Christian Ogilvie, MD; Edward Cheng, MD; Kristen Jones, MD; Christopher Martin, MD
- 11:58 Paper 62: Shorter Length of Stay and Increased Return to Work with Cervical Disc Arthroplasty Versus Anterior Cervical Discectomy and Fusion
Philip Zakko; Alex K. Miller, MD; Travis Hamilton; Victor Chang; Daniel Park; Jad Khalil
- 12:00 Paper 63: Timing of nerve transfer surgery for C5 palsy: does recovery at 6 months predict final recovery?
Yamaan Saadeh, MD; Paul Park; Osama Kashlan; Brandon Smith
- 12:02 Paper 64: Incidence of Major Complications in Lateral Lumbar Interbody Fusion (LLIF) Performed via the Prone Transpsoas (PTP) Technique: A Survey of the Complete Early Experience
Luiz Pimenta, MD, PhD; William Taylor, MD; Kelli Howell; PTP Surgeon Council
- 12:04 Paper 65: Clinical outcomes of the Prone Transpsoas Lateral Lumbar Interbody Fusion for Degenerative lumbar Spine Disease: A Multicentre Study
Mohamed A. Soliman, MD, MSc, PhD; Luis Diaz-Aguilar; Asham Khan; Jose San Miguel; Rodrigo Amaral; Bryan S. Lee; Muhammad Abd-El-Barr; Gene Massey, MD; Craig McMains; David Schwartz; Gurvinder S. Deol; Andrew D. Nguyen, MD, PhD; Tyler Smith; Luiz Pimenta, MD, PhD; William Taylor, MD; John Pollina
- 12:06 Paper 66: Complications associated with single position prone lateral lumbar interbody fusion: a systematic review and meta-analysis
S. Harrison Farber, MD; Bayron Valenzuela Cecchi; Luke O'Neill; James Zhou; Joseph Didomenico; Nima Alan; Laura Snyder; Jay Turner; Juan Uribe
- 12:08 Paper 67: Minimally Invasive Lateral Lumbar Interbody Fusion for Clinical Adjacent Segment Pathology - A Comparative Study with Conventional Posterior Lumbar Interbody Fusion -
Hyung-Youl Park; Soo-Bin Park; Hoonseok Sung; Hyungchul Park; Sang-Il Kim; Yoon-Hoon Kim

12:10 Paper 68: Comparison of Pressure on the Soft Tissue Using 2 Different Lateral Retractors: Sweeping in Muscular Plane vs. Traditional Tubular Dilation
Burak M. Ozgur; Sunil Jeswani

12:12 Paper 69: Risk factors analysis for inferior clinical outcome and recurrence after full-endoscopic interlaminar discectomy (FEID) for lumbar disc herniation; a prospective observational study
Jung-woo Hur

12:14 pm **Boxed Lunches in Exhibit Hall** **Tower Ballroom 4-8**

Session 13: MIS Confessionals: Where My Case Went South (beer provided!) DaVinci Ballroom

Mods: J. McGowan, MD & A. Clark, MD

12:35 pm MIS lateral case confessional D. Pelle, MD

12:40 pm Case discussion

12:45 pm MIS deformity case confessional L. Macyszyn, MD

12:50 pm Case discussion

12:55 pm Robotics case confessional L. Tan, MD

1:00 pm Case discussion

1:05 pm MIS trauma case confessional D. Hafez, MD

1:10 pm Case discussion

1:20 pm Closing comments J. Sembrano, MD

1:25 pm Adjourn