



CSRS 37th Annual Meeting

**December 3 – 5, 2009
Grand America Hotel – Salt Lake City, Utah**

Frank M Phillips, MD - Program Chair
Todd J Albert, MD - President

FOUNDED 1973

Thursday, December 3, 2009

Imperial Ballroom

7:15 am – 7:25 am	Welcome and Announcements Frank M Phillips, MD
Session I Moderators	TOTAL DISC REPLACEMENT I Robert F Heary, MD; K Daniel Riew, MD
7:25 - 7:31 am Paper #1	5-year results of the prospective, randomized, multicenter FDA Investigational Device Exemption (IDE) ProDisc.-C TDR clinical trial Daniel Murrey, MD ; Michael E Janssen, DO; Rick B Delamarter, MD; Jeffrey A Goldstein, MD; Jack E Zigler, MD; Bobby Tay, MD; Bruce V Darden, II, MD
7:32 - 7:38 am Paper #2	Long-term Clinical and Radiographic Outcomes of the PRESTIGE ST Cervical Disc Replacement: Results from a Prospective Randomized Controlled Clinical Trial Regis W Haid, MD ; J Kenneth Burkus, MD; Vincent C Traynelis, MD; Thomas A Zdeblick, MD; Praveen V Mummaneni, MD
7:39 - 7:45 am Paper #3	Cervical Disc Replacement: Four year follow-up results from the United States prospective randomized Bryan Clinical Trial Rick C Sasso, MD ; John G Heller, MD; Paul A Anderson, MD; Stephen M Papadopoulos, MD; Richard G Fessler, MD
7:46 - 7:52 am Paper #4	Longitudinal long-term radiographic follow-up after treatment of cervical disc degenerative disease with the Bryan Cervical Disc Prosthesis Joris RR Walraevens, MSc ; Jos Vander Sloten, PhD; Philippe Demaerel, MD, PhD; Paul Suetens, PhD; Johan van Loon, MD, PhD; Frank Van Calenbergh, MD, PhD; Jan Goffin, MD, PhD
7:53 – 8:03 am	Discussion
Session II Moderators	ANTERIOR CERVICAL SURGERY William F Donaldson, III, MD; Jack E Zigler, MD
8:04 - 8:10 am Paper #5	Gastroesophageal Reflux following Anterior Cervical Surgery: A Controlled, Prospective Analysis Jeffrey A Rihn, MD ; Justin Kane, MD; Alexander R Vaccaro, MD, PhD; David G Anderson, MD; Ashish Joshi, MD, MPH; James S Harrop, MD; Todd J Albert, MD; Alan S Hilibrand, MD
8:11 - 8:17 am Paper #6	Current Smoking Status is an Important Predictor of Patient Response to Anterior Cervical Fusion with Instrumentation in Patients with Single-Level Degenerative Disc Disease. Results from a Multi-Center Randomized Controlled Trial Ashvin Patel, MD ; Michael G Fehlings, MD, PhD; Rick C Sasso, MD
8:18 - 8:24 am Paper #7	Immediate Postoperative Complications and Radiological Features Of Interbody Fusion Between Infuse BMP and Actifuse : A Randomized Prospective Trial Lali Sekhon, MD, PhD, FACS ; Andrew Tomlinson; Ben Allen; James Lynch, MD, FRCSI, FACS; John R Hurlbert, MD, PhD, FRCS FACS
8:25 - 8:31 am Paper #8	Early Failure of Bioabsorbable Anterior Cervical Plates Darren R Lebl, MD ; Umesh Metkar, MD; Brian Grottkau, MD; Kirkham B Wood, MD
8:32 – 8:42 am	Discussion
8:43 – 8:45 am	Introduction of Presidential Guest Speaker – Todd J Albert, MD
8:46 – 9:16 am	PRESIDENTIAL GUEST SPEAKER H Alan Crockard, MD, FRCS
9:17 - 9:47 am	BREAK

Session III Moderators	OUTCOMES/ECONOMICS I John G Heller, MD; Lee H Riley, III, MD
9:48 - 9:54 am Paper #9	The Surgeon's Choices, and the Choice of Surgeons, affect the Cost of Single-Level Anterior Cervical Surgery Garry J Schwall, MBA, RPA; Nancy E Epstein, MD; Donald C Hood, PhD; Timothy Reilly, MBA; Thomas Insinna, MPH; Andrea Bahnken, RIHA
9:55 - 10:01 am Paper #10	Predictors of Costs and Resource Utilization in Anterior Cervical Spine Surgery: National Trends and Disparities 1992-2005 Hassan Alish; Lee H Riley III, MD; Richard Skolasky, ScD
10:02 - 10:08 am Paper #11	Patient Perceptions of Surgeon-Industry Relations Scott C McGovern, MD; Robert T Trousdale, MD; Bradford L Currier, MD
10:09 – 10:15 am Paper #12	Neck Disability Index, SF-36 PCS, and Pain Scales for Neck and Arm Pain: the Minimum Clinically Important Difference and Substantial Clinical Benefit after Cervical Spine Fusion Leah Yacat Carreon, MD, MSc; Steven D Glassman, MD; Paul A Anderson, MD
10:16 – 10:26 am	Discussion
Session IV Moderators	COMPLICATIONS Sanford E Emery, MD, MBA; Alexander Ghanayem, MD
10:27 – 10:33 am Paper #13	Morbidity and Mortality Of Major Adult Spinal Surgery. A Prospective Cohort Analysis Of 942 Consecutive Patients John Street, MD; Brian Lenehan, MD; Brian Kwon, MD; Scott Paquette, MD; Raja Rampersaud, MD; Michael Boyd, MD; Charles Fisher, MD; Marcel Dvorak, MD
10:34 - 10:40 am Paper #14	A Prospective Independent Assessment of Complications in Cervical Spine Surgery John Kevin Ratliff, MD; Rohan Chitale, MD; Jennifer Malone, NP; Mitchell Maltenfort, PhD; Ashwini Sharan, MD; James Harrop, MD
10:41 - 10:47 am Paper #15	Tardy Neurological Complications after Correction of Cervical Kyphosis using Pedicle Screw System Yoshihiro Hojo, MD; Manabu Ito, MD; Kuniyoshi Abumi, MD; Yoshihisa Kotani, MD; Hideki Sudo, MD; Masahiko Takahata, MD; Akio Minami, MD
10:48 - 10:54 am Paper #16	Blindness after Cervical Spine Surgery: Risk Factors and Strategies for Prevention William F Young, MD; Lauren E Young, BA
10:55 – 11:05 am	Discussion
11:06 - 11:51 Moderator	Symposium I: My Worst Complications: How I Managed Them and What I Learned Steven R Garfin, MD
11:06 - 11:16 am	John G. Heller, MD
11:16 - 11:26 am	Frank J Eismont, MD
11:26 - 11:36 am	Ronald I Apfelbaum, MD
11:36 - 11:51 am	Discussion
11:52 – 12:54 pm	Lunch
Session V Moderator	Research Session Darrel S Brodke, MD
12:55 – 1:00 pm	Announcement of 2009 21 st Century Premier Donor Research Grant Winners Funded by the CSRS Research & Education Premier Donors: Aesculap Synthes Spine DePuy Spine Stryker Spine Medtronic
1:01 – 1:02 pm	21st Century Research & Education Grants High-Resolution Diffusion Tensor Imaging (DTI) in Patients with Cervical Spondylotic Myelopathy Alpesh A Patel, MD; Eun-Kee Jeong, PhD
1:03 – 1:04 pm	In Vivo Mechanics of Pain Resolution following Conservative Treatment for Cervical Radiculopathy William Anderst, MS; James D Kang, MD; William F Donaldson, MD; Joon Y Lee, MD
1:05 – 1:06 pm	In Vivo Quantification of Adjacent Level Cervical Disc Integrity Following Anterior Cervical Decompression and Fusion and Laminoplasty: A Matched Pair Analysis and Comparison Using T1rho-weighted MRI Joshua D Auerbach, MD; K Daniel Riew, MD; Baron S Lonner, MD

1:07 – 1:08 pm	Seed Starter Research & Education Grants Validation of Cervical Spine Surgical Stimulation Paul A Anderson, MD; Thomas A Zdeblick, MD
1:09 – 1:10 pm	Resident/Fellow Research & Education Grants Functional Magnetic Resonance Imaging Evaluation of the Injured Human Spinal Cord: An Assessment of Recovery and Functional Plasticity David W Cadotte, MD; Michael G Fehlings, MD, PhD
1:11 – 1:12 pm	Atlanto-Axial Kinematics: Is Motion Preservation at C1-C2 Possible in Cases of Congenital or Acquired Atlanto-Axial Instability? Kyle A Mitsunaga, MD; Robert Hart, MD
1:13 – 1:14 pm	Prospective Clinical Study Emphasizing Natural History of Cervical Spine Disorders Jon T Willie, MD, PhD; Neill M Wright, MD
1:15 – 1:16 pm	Introduction – 2008 Research Grant Updates
1:17 – 1:22 pm	In Vivo Mechanics of Pain Resolution following Conservative Treatment for Cervical Radiculopathy William Anderst, MS; James D Kang, MD; William F Donaldson, III, MD; Joon Y Lee, MD
1:23 – 1:28 pm	In Vivo Quantification of Adjacent Level Cervical Disc Integrity Following Anterior Cervical Decompression and Fusion and Laminoplasty: A Matched Pair Analysis and Comparison Using T1rho-weighted MRI Joshua D Auerbach, MD; K Daniel Riew, MD; Baron S Lonner, MD
1:28 – 1:38	Discussion
Session VI Moderator	BIOMECHANICS I Robert Hart, MD; John S. Kirkpatrick, MD
1:39 - 1:45 pm Paper #17	A Novel 3D Stress MR Imaging Approach to Detect Altered Biomechanics in Neck Pain Patients Beth A Winkelstein, PhD ; Jay Udupa; Alan S Hilibrand, MD; James Schuster; Sorin Siegler; Bruce Hirsch; Ari Borthakur; Elias Melham
1:46 - 1:52 pm Paper #18	Validation of a Non-Invasive Technique to Precisely Measure In Vivo Three-Dimensional Cervical Spine Movement William J Anderst, MS ; William F Donaldson, III, MD; Joon Y Lee, MD James D Kang, MD
1:53 - 1:59 pm Paper #19	In Vivo Three-Dimensional Kinematics of the Luschka's Joints during Head Rotation Yukitaka Nagamoto, MD ; Takahiro Ishii, MD, PhD; Hironobu Sakaura, MD, PhD; Motoki Iwasaki, MD, PhD; Hisao Moritomo, MD, PhD; Masafumi Kashii, MD, PhD; Hideki Yoshikawa, MD, PhD; Kazuomi Sugamoto, MD, PhD
2:00 – 2:06 pm Paper #20	Primary and Coupled Motions in the Cervical Spine after Total Disc Replacement Avinash G Patwardhan, PhD ; Leonard I Voronov, MD, PhD; Robert M Havey, BS; Michael N Tzermiadianos, MD; Susan M Renner, PhD; Alexander J Ghanayem, MD; Michael R Zindrick, MD; Mark A Lorenz, MD; Frank M Phillips, MD
2:07 – 2:17 pm	Discussion
2:18 - 2:25 pm	Special Projects Committee Report Jeffrey S Fischgrund, MD
2:26 - 2:30 pm	Discussion
2:31 – 3:01 pm	BREAK
3:02 – 4:14 pm Moderator	Symposium II Alexander R Vaccaro, MD, PhD
3:02 - 3:04 pm	Case Presentation #1: A 16-year old Male Presents Complaining of Sub-Axial Neck Pain after Sustaining a Blow to the Head while Playing Football. His physical exam reveals no abnormalities and his neurological exam is normal. Imaging studies reveal an os spondiloideum with significant motion on flexion and extension radiographs.
3:04 - 3:09 pm	Position 1: This Patient would Benefit from Surgery - James D Kang, MD
3:09 - 3:14 pm	Position 2: Surgery would be of No Benefit to this Patient - Rick C Sasso, MD
3:14 - 3:20 pm	Discussion

3:20 - 3:22 pm **Case Presentation #2:** An 82-year old active male in good health presents complaining of neck pain after sustaining a fall. His neurological exam reveals no abnormalities. Imaging studies reveal a non-displaced Type-II Odontoid fracture.

3:22 - 3:27 pm Position 1: This Patient would Benefit from Surgery - Alpesh Patel, MD

3:27 - 3:32 pm Position 2: Surgery would be of No Benefit to this Patient; Recommend Collar and Follow-up - Jeffrey S Fischgrund, MD

3:32 - 3:38 pm **Discussion**

3:38 - 3:40 pm **Case Presentation #3:** A 45-year old otherwise healthy businessman presents with Hyper-reflexia that was found incidentally while the patient was undergoing a routine screening exam for his Life Insurance. He denies any symptoms, including neck or arm pain. He has a normal gait and fine motor coordination of the hands. Physical examination reveals diffuse hyper-reflexia, positive bilateral Hoffman's signs but no clonus and a negative Babinski bilaterally. MRI reveals diffuse severe cervical spondylosis with evidence of myelomalacia on T2-weighted sequences.

3:40 - 3:45 pm Position 1: This Patient would Benefit from Surgical Decompression – Paul M. Arnold, MD

3:45 - 3:50 pm Position 2: Surgical Decompression would be of No Benefit in an Asymptomatic Patient – Jonathan N Grauer, MD

3:50 - 3:56 pm **Discussion**

3:56 - 3:58 pm **Case Presentation #4:** A 45-year old otherwise healthy woman presents with three months of severe left upper extremity radiculopathy in a C6 distribution. She has not responded to physical therapy and a series of transforaminal injections. She admits to a one-year history of low grade axial neck pain. Physical examination reveals a positive Spurling's sign, diminished sensation in a C6 distribution but is otherwise normal. MRI reveals a diffuse disc bulge with a focal left sided herniation at C5-6.

3:58 - 4:03 pm Position 1: ACDF is the Appropriate Treatment – Jeffrey C Wang, MD

4:03 - 4:08 pm Position 2: Cervical TDR is the Appropriate Treatment – Thomas A Zdeblick, MD

4:08 - 4:14 pm **Discussion**

Session VII
Moderator

TRAUMA I
Kazuhiro Chiba, MD; Steven C Ludwig, MD

4:15 - 4:21 pm **Assessment of the Posterior Ligamentous Complex following Acute Cervical Spine Trauma: A Prospective Comparison of Preoperative MRI and Intraoperative Findings**
Paper #21
Jeffrey A Rihn, MD; Charles Fisher, MD; Davor Saravanja, MD; William B Morrison, MD; James Harrop, MD; Harvey E Smith, MD; Todd J Albert, MD; Alexander R Vaccaro, MD, PhD

4:22 - 4:28 pm **Acute Cervical Spinal Cord Injury Complicated by the Ossification of the Posterior Longitudinal Ligament: A Multicenter Study of 106 patients**
Paper #22
Hirotsuka Chikuda, MD; Atsushi Seichi, MD; Katsushi Takeshita, MD; Yoshiaki Toyama, MD; Kozo Nakamura, MD

4:29 – 4:35 pm **Surgical vs. Conservative Treatment of Type 2 Odontoid Fractures in Elderly Patients: Analysis of AOSpine North America Prospective Multicenter Study in 198 Patients**
Paper #23
Alexander R Vaccaro, MD, PhD; Branko Kopjar, MS, MD, PhD Jens R Chapman, MD; Christopher I Shaffrey, MD; Paul M Arnold, MD; Darrel S Brodke, MD; Harvey E Smith, MD; Michael G Fehlings, MD, PhD

4:36 – 4:42 pm **Remodeling of C2 Facet Deformity Prevents Recurrent Subluxation in Patients with Chronic Atlantoaxial Rotatory Fixation - A New Strategy for Treatment of Chronic AARF**
Paper #24
Ken Ishii, MD, PhD; Morio Matsumoto, MD, PhD; Kota Watanabe, MD, PhD; Takashi Tsuji, MD, PhD; Hironari Takaishi, MD, PhD; Masaya Nakamura, MD, PhD; Yoshiaki Toyama, MD, PhD; Kazuhiro Chiba, MD, PhD

4:43 – 4:49 pm **Does Blood Alcohol Concentration on Admission at Emergency Department Influence Survival, Impairment and Disability Following Traumatic Spinal Cord Injury?**
Paper #24a
Julio C Furlan, MD, MBA, MSc, PhD; Michael G Fehlings, MD, PhD

4:50 – 5:00 pm **Discussion**

5:00 PM Adjourn

6:00 – 8:00 pm Welcome Reception & Poster Session – TBD

Friday, December 4, 2009

7:15 – 7:20 am Announcements

Session VIII
Moderators

ADJACENT LEVELS
Jan Goffin, MD, PhD; Alan S Hilibrand, MD;

7:21 - 7:27 am **Comparison of Adjacent Segment Motion following ACDF versus ProDisc C Arthroplasty: Analysis from a Randomized, Controlled Trial with 2 Years Follow-up**
Paper #25
Michael P Kelly, MD; James M Mok, MD; Richard F Frisch, MD; Bobby Tay, MD

7:28 – 7:34 am Paper #26	The In Vivo Effects of Cervical Total Disc Replacement and Anterior Cervical Discectomy and Fusion on Treated and Adjacent Segments; Implications for Adjacent Level Degeneration Daniel K Park, MD; Eric L Lin, MD; Frank M Phillips, MD
7:35 – 7:41 am Paper #27	Factors Related to Adjacent Segment Degeneration after Anterior Cervical Decompression and Fusion - Minimum 10- Year Follow-up Morio Matsumoto, MD; Okada Eijiro, MD; Daisuke Ichihara, MD; Kota Watanabe, MD; Yoshiaki Toyama, MD; Kazuhiro Chiba, MD; Hirokazu Fujiwara, MD; Yuji Nishiwaki, MD
7:42 – 7:48 am Paper #28	Does Adjacent Level Disease Occur After Open-Door Cervical Laminoplasty? A Pilot Radiological and Clinical Study Gabriel Liu, FRCSEd; Jacob M Buchowski, MD; Torphong Bunmaprasert, MD; K Daniel Riew, MD
7:49 – 7:59 am	Discussion
8:00 – 8:05 am	Introduction of CSRS President
8:06 – 8:31 am	PRESIDENTIAL ADDRESS – Todd J Albert, MD
8:32 – 8:40 am	Discussion
8:41 – 8:48 am	Preview CSRS USA 2010 Annual Meeting, Charlotte, North Carolina Bruce V Darden, II, MD
8:49 – 8:56 am	Preview CSRS 2010 European Section Meeting: Corfu Island, Greece Jose M Casamitjana, MD
8:57 – 9:42 am	Posters “LIVE”
9:43 - 10:13 am	BREAK
Session IX Moderators	TOTAL DISC REPLACEMENT II Paul A Anderson, MD; Bruce V Darden, II, MD
10:14 - 10:20 am Paper #29	Degeneration of the Facet Joints after Cervical Total Disc Replacement: A Prospective Five Year Follow-up Study in 158 Patients Luiz Pimenta, MD, PhD; Etevaldo Coutinho, MD; Luis Marchi, MSc; Leonardo Oliveira, BS
10:21 - 10:27 am Paper #30	A 6-year Analysis of Loosening of Bryan Cervical Disc Prosthesis using Radiostereometry Bengt I Lind, MD, PhD; Bjorn Zoega, MD, PhD
10:28 - 10:34 am Paper #31	Predicting Relief of Neck and Arm Pain in Patients Receiving ACDF or TDR: Factors Associated with Response Frank M Phillips, MD; B Braksma, MD; Todd J Albert, MD; Jeanette Ahrens
10:35 – 10:41 am Paper #32	Improved Assessment of MRI Artifact following Cervical Total Disc Arthroplasty Amir H Fayyazi, MD; David Svach, MS; Shaun Hanson, BSME; Jian Chen, MD; Jennifer Taormina, BS; Nathaniel Ordway, MS
10:42 – 10:52 am	Discussion
10:53 – 10:56 am	Announcement of Poster Award Winner
10:57 – 12:02 pm Moderator	Symposium III: Defining Value in Cervical Spine Care Frank M. Phillips, MD
10:57 – 11:07 am	How do we Define and Measure Value? – Sigurd H Berven
11:07 – 11:17 am	Value Assessment of New Spinal Technologies – Frank M Phillips, MD
11:17 – 11:27 am	Comparative Effectiveness: What does It Mean to Us? – David A. Wong MD, MSc, FRCS(C)
11:27 – 11:37 am	Value in Spine Care: The European Experience – H Alan Crockard, MD, FRCS
11:37 – 11:47 am	Value: The Case for Cervical TDR and ACDF – Todd J Albert, MD
11:47 – 12:02 pm	Discussion
12:12 PM	Adjourn

7:15 – 7:20 am	Announcements
Session X Moderators	OUTCOMES/ECONOMICS II Bernard A Rawlins, MD; Vincent C Traynelis, MD
7:21 – 7:27 am Paper #33	Anterior versus Posterior Surgical Decompression for Cervical Spondylotic Myelopathy: Analysis of AOSpine North America Prospective Multicenter Trial in 304 Patients Michael G Fehlings, MD PhD; Branko Kopjar, MD, MS, PhD; Paul M Arnold, MD; Tim S Yoon, MD; Alexander R Vaccaro, MD, PhD; Eric J Woodard, MD; Darrel S Brodke, MD; Jens R Chapman, MD; Christopher I Shaffrey, MD
7:28 – 7:34 am Paper #34	A Prospective Randomized Study of Patients undergoing Anterior Cervical Surgery for Disc Herniation - More than 12 year Follow-up Bjorn Zoega, MD, PhD ; Bengt I Lind, MD PhD; Helena Brisby, MD, PhD
7:35 – 7:41 am Paper #35	Prospective Cohort Study of Mild Extent Cervical Spondylotic Myelopathy (CSM) without Surgical Treatment Masatoshi Sumi, MD ; Shuichi Kaneyama, MD; Tepei Suzuki, MD; Hiroshi Miyamoto, MD; Takako Kanatani, MD; Kokichi Uno, MD
7:42 – 7:48 am Paper #36	Observational Analysis of CSRS Annual Meeting (2000-04) Free-Papers: From Presentation to Publication Nanjundappa S Harshavardhana, MS ; Harshad V Dabke, MS, FRCS; John P Dormans, MD, FRCSC
7:49 – 7:59 am	Discussion
Session XI Moderators	POSTERIOR CERVICAL SURGERY Bradford L Currier, MD; William C Welch, MD
8:00 - 8:06 am Paper #37	The Effectiveness of Didactic Learning and Cadaver Workshops on Training Surgeons' Placement of Cervical Spine Instrumentation: A Cadaver Study with CT Analysis Kamran Majid, MD ; Paul Stanton, DO; Jeffrey S Fischgrund, MD
8:07 - 8:13 am Paper #38	Impact on the Sagittal Alignment of the Cervical Spine After Two Different Atlantoaxial Fixation Techniques - Comparison between C1 Lateral Mass Screw with C2 Pedicle Screw and Magerl Procedure Shigeki Oshima, MD, PhD ; Kuniyoshi Abumi, MD, PhD; Manabu Ito, MD, PhD; Masatoshi Sanda, MD; Yoshihisa Kotani, MD, PhD; Hideki Sudo, MD, PhD; Yoshihiro Hojo, MD, PhD; Yuichiro Abe, MD, PhD
8:14 – 8:20 am Paper #39	Radiographic Analysis of the Feasibility of C2 Pedicle Screw Placement in a Pediatric Population Wu Zhuge, MD; Chris I Phelps, MD; Vivek P Kushwaha, MD; Rex A Marco, MD
8:21 – 8:27 am Paper #40	The Outcome of Posterior Decompression Surgery for Patients with Cervical Myelopathy Due to the K-line(-)-Type OPLL: Laminoplasty versus Posterior Decompression with Instrumented Fusion Takayuki Fujiyoshi, MD, PhD; Masashi Yamazaki, MD, PhD ; Hiroaki Konishi, MD, PhD; Akihiko Okawa, MD, PhD; Junko Kawabe, MD, PhD; Takeo Furuya, MD, PhD; Koichi Hayashi, MD; Kazuhisa Takahashi, MD
8:28 – 8:38 am	Discussion
Session XII Moderators	BIOLOGICS Darryl M Antonacci, MD; Christopher I Shaffrey, MD
8:39 - 8:45 am Paper #41	Therapeutic Effects of Oxygen Dependent Degradation (ODD) Domain in a Hypoxia-Inducible Gene Expression System for Spinal Cord Injury Treatment Yoon Ha, MD ; Hong Lian Jin, MD PhD; Keung Nyun Kim, MD PhD; Do Heum Yoon, MD, PhD
8:46 - 8:52 am Paper #42	Effect of Hyperglycemia on Apoptosis of Notochordal Cells and Intervertebral Disc Degeneration in Diabetic Rats Jong-Beom Park, MD, PhD ; Ho-Yeon Won, MD; Eun-Young Park, BS; K Daniel Riew, MD
8:53 – 8:59 am Paper #43	Inflammatory Characteristics of rhBMP-2 In Vitro and in an In Vivo Rodent Model Kwang-Bok Lee, MD ; Emil Cyrus Taghavi, BS; Jeffrey C. Wang, MD; Song Kyung-Jin, MD; Channanit Sintuu, PhD; Shia-Tzu Tzeng, MD; Gun Kerochana, MD; Jeong Hyun Yoo, MD; Zhiqiang Fei, MD
9:00 – 9:06 am Paper #44	Schwann Cell Plasticity after Spinal Cord Injury shown by Neural Crest Lineage Tracing Narihito Nagoshi ; Masaya Nakamura; Shinsuke Shibata; Yumi Matsuzaki; Hideyuki Okano; Yoshiaki Toyama

9:07 - 9:13 am Paper #45	Cervical Interbody Fusion: Improved Efficacy and Safety of Mesenchymal Precursor Stem Cells Relative to Autograft or Bone Substitute Tony Goldschlager, MBBS; Jeffrey V Rosenfeld, MD, FRCS; Peter Ghosh, DSc, PhD; Silviu Itsecu, MD, PhD; Carl Blecher, MBBS FRANCR; Catriona McClean, MD FRACP; Mark Williamson, PhD; Graham Jenkin, BSc, PhD
9:14 – 9:24 am	Discussion
Session XIII Moderators	TRAUMA II Seth Zeidman, MD
9:25 – 9:31 am Paper #46	This paper has moved to Thursday afternoon and is shown on the Program as Paper #24a.
9:32 - 9:38 am Paper #47	Evaluating the Use and Utility of Digital Angiography in Diagnosing Blunt Cervical Arterial Injury: A Cost-Benefit Analysis Anthony C Wang, MD; Michael A Charters, MD; Jayesh P Thawani, BSE; Khoi D Than, MD; Stephen E Sullivan, MD; Gregory P Graziano, MD
9:39 - 9:45 am Paper #48	Therapeutic Effect of Pre-Evaluated {safe} iPS Derived Neurospheres for Spinal Cord Injury Tsui Osahiko; Miura Kyoko; Fujiyoshi Kanehiro; Kazuhiro Chiba; Yamanaka Shinya; Okano Hideyuki; Toyama Yoshiaki; Nakamura Masaya
9:46 - 9:52 am Paper #49	Comparison of Performance-Based Outcomes following Nonoperative and Operative Treatment for Cervical Disc Herniations in National Football League Athletes Wellington K Hsu, MD
9:53 – 10:03 am	Discussion
10:04 - 10:09 am	Presentation of CSRS Medallion to John G Heller, MD
10:10 – 10:40 am	BREAK
Session XIV Moderators	DIAGNOSIS Avi J Bernstein, MD
10:41 – 10:47 am Paper #50	Post-operative MRI Scan is Predictive of Recovery following Surgery in Cervical Spondylotic Myelopathy: A Prospective Blinded Study Babal Arvom. FRCS(SN), PhD
10:48 - 10:54 am Paper #51	MR Imaging of Cervical Spine in 1200 Asymptomatic Subjects Yasutsugu Yukawa, MD; Fumihiko Kato, MD; Kota Suda, MD; Masatsune Yamagata, MD; Takayoshi Ueta, MD
10:55 - 11:01 am Paper #52	A Comparison of CT Measures for Diagnosing Cervical Spinal Stenosis C Edward Hoffler, PhD MD; Brett Freedman, MD; Tim S Yoon, MD, PhD; John M Rhee, MD; Maneesh Bawa, MD
11:02 - 11:08 am Paper #53	Neurological Laterality in Cervical Compression Myelopathy Hisanori Mihara, MD; Soichi Kondo, MD; Shinya Katoh, MD; Koh Ishida, MD; Masashi Hachiya, MD
11:09 – 11:19 am	Discussion
Session XV Moderators	OCCIPITO CERVICAL JUNCTION Rick B Delamarter, MD; Alpesh A Patel, MD
11:20 - 11:26 am Paper #54	Outcome of Intentional C2 Nerve Transection for Exposure During Atlantoaxial Segmental Screw Fixation Jin S Yeom, MD; Kun-Woo Park, MD; Bong-Soon Chang, MD; Choon-Ki Lee, MD; K Daniel Riew, MD
11:27 – 11:33 am Paper #55	The Effect of Aging on Internal Carotid Artery Location around the Atlas Jae Taek Hong, MD, PhD; Sup Kim; Sang Won Lee; Chun Kun Park; Byung Chul Son; Jae Hoon Sung; Seung Ho Yang
11:34 - 11:40 am Paper #56	Clinical Feature of Crowned Dens Syndrome Tetsuro Hida, MD; Yasutsugu Yukawa, MD; Keigo Ito, MD; Atsushi Harada, MD; Fumihiko Kato, MD
11:41 - 11:47 am Paper #57	Missed Ligamentous Injuries of the Occipito-Cervical Complex David Dominguez, MD; Christopher D Chaput, MD; Jonathan Walgama, BS; Jeramie Hanson, BS; Mark Rahm, MD
11:48 – 11:58 am Session XVI	Discussion BIOMECHANICS II

Moderators	Darrel S Brodke, MD; JJ Trey Crisco, PhD
11:59 -12:05 pm Paper #58	The Effects of Soft and Rigid Collars on the Functional Range of Motion of the Cervical Spine during Fifteen Activities of Daily Living Christopher P Miller, BA; Jesse E Bible, MD; Kola A Jegede, BA; Peter G Whang, MD; Jonathan N Grauer, MD
12:06 - 12:12 pm Paper #59	Biomechanical Evaluation of a Low Profile, Anchored Cervical Interbody Spacer Device at the Index Level or Adjacent to Plated Fusion Ajay K Balaram, MD ; Alexander J Ghanayem, MD; Patrick T O'Leary, MD; Leonard I Voronov, MD, PhD; Robert M Havey, BS; Gerard Carandang, MS; Celeste Abjornson, PhD; Avinash G Patwardhan, PhD
12:13 - 12:19 pm Paper #60	In Vitro Biomechanics of Multi-level Cervical Disc Arthroplasty versus Fusion: ProDisc-C versus Prestige-LP Denis J DiAngelo, PhD ; Laura Gilmour, MS; John S Schwab, MS; Kevin T Foley, MD; John W German, MD; Constantine Demetropoulos, PhD; Brian P Kelly, PhD
12:20 – 12:26 pm Paper #61	Progressive Circumferential Ligament Resection (Decompression) in Conjunction with Cervical Disc Arthroplasty in a Spondylotic Spine Model Rolando F Roberto, MD ; Thomas McDonald, MD; Shane Curtiss, SRA; Corey Neu, PhD; Kee Kim, MD Frederick Pennings, MD
12:27 – 12:37 pm	Discussion
Session XVII Moderators	INFECTION/TUMOR/METABOLIC D Greg Anderson, MD
12:38 – 12:44 pm Paper #62	Primary Pyogenic Infection of the Cervical Spine in Intravenous Drug Users John Street, MD ; Brian Lenehan, MD; Charles Fisher, MD
12:45 – 12:51 pm Paper #63	Obesity Increases The Rate Of Wound Infection With Posterior Cervical Decompression With Instrumentation For Myelopathy Christopher D Chaput, MD; Cyrus Caroom, MD
12:52 - 12:58 pm Paper #64	Evidence of an Inherited Predisposition for Cervical Spondylosis with Myelopathy Alpesh Patel, MD ; William R Spiker, MD; Michael Daubs, MD; Darrel S Brodke, MD; Lisa Cannon-Albright, PhD
12:59 - 1:05 pm Paper #65	Comprehensively Quantitative Assessment of the 128 Patients with Cervical Myelopathy Before and After Surgery, using 10 Second Step Test, 10 Second Grip and Release Test and Thirty Meter Walking Test Nakashima Hiroaki, MD ; Yukawa Yasutsugu, MD; Ito Keigo, MD; Machino Masaaki, MD; Kanbara Shunsuke, MD; Kato Fumihiko, MD
1:06 – 1:16 pm	Discussion
1:16 PM	Adjourn