

Artificial Cervical Discs

Overview of Meetings, Papers, & Abstracts

10/5/2004

Bryan 2004 KEY MEETINGS/PAPERS/PRESENTERS

	Date	Location	Abstract Deadline	Paper(s) Submitted (Author) Accepted=Red
Major U.S. Meetings				
AAOS/ORS	March 10-14	San Francisco	7/1/2003	Bone Ingrowth Study (Anderson)
Joint Section	March 17-20	San Diego	9/10/2003	OUS Clinical Results (Papadopoulos), Wear Tested vs Explanted Bryan (Anderson)
AANS	May 1-6	Orlando	8/20/2003	OUS Clinical Results (Fessler), RSA (Lind)
Society for Biomatetrials	May-21	Sydney, AU	9/19/2003	Assessment of Stability and Intervertebral Motion for a Cervical Disc Prosthesis (Rouleau) Static and Fatigue Analysis of a Cervical Disc Prosthesis (Rouleau)
AOA	June 23-24	Boston		Explant Analysis (Anderson)
CNS	Oct. 16-24	San Francisco	4/2/2004	Testing Validation (Papadopoulos), Refining Indications (Haid), Tribology 101 (Haid), IDE Site Data (Hacker)
NASS	Oct. 26-30	Chicago	2/10/2004	Impact Testing (Papadopoulos), Updated RSA (Lind), European Clinical Study (Goffin) , Ingrowth Study (Anderson), Testing Vaidation of a CDP (Heller), IDE Site Data (Sasso), Wear Testing vs Explant (Anderson)
CSRS	Dec. 9-11	Boston	6/17/2004	IDE Site Data (Sasso), Explant Analysis (Anderson), Wear Analysis (Anderson), Motion Analysis (Duggal), Bryan vs. Affinty (Robertson), Arthrolasty vs Fusion Debate (Goffin)
Major OUS Meetings				
Australian Spine Society			1/1/2004	Site Clinical Results (Sears)
Spineweek	5/30-6/5	Porto, Portugal	11/16/2003	OUS Clinical Results (Goffin), RSA (Lind), Ingrowth Study (Anderson), NSAID (Heller)
IMAST	July 1-3	Bermuda	3/1/2004	IDE Site Data (Riew), Refining Indications (Sasso), Explant vs Testing (Fessler), European Study Results (Fessler), Own Clinical Experience (Duggal) , Session: Preserving Motion in the Diseased Cervical Disc: Traynelis - Chairman, Haid and Sasso - Faculty
Spine Arthroplasty Sociey	May 4-7	Vienna, Austria	1/4/2004	OUS Clinical Results (Pointillart), RSA (Lind), Ingrowth Study (Anderson), Wear Analysis (Anderson) Testing Validation of a Cervical Disc Prosthesis (Heller), Site Data (Sasso) , Multivlevel Experience (Moloney) Site Data (Sambale)
Non-Fusion Congress	Sep-11	Milan, Italy		
Latin American Neuro Congress				
Journal Submissons (to be published in 2004)				
SPINE				Artificial Disc Materials (Vacarro)
Neurosurgical Focus				Articles by Kim, Mummananeni, Foley, Vacarro

Prestige 2004 KEY MEETINGS/PAPERS/PRESENTERS

	Date	Location	Abstract Deadline	Paper(s) Submitted (Authors) Accepted=Red
Major U.S. Meetings				
AAOS/ORS	March 10-14	San Francisco	7/1/2003	None
Joint Section	March 17-20	San Diego	9/10/2003	Biomechanical Results (Traynelis), Wear Testing Results (Traynelis)
AANS	May 1-6	Orlando	8/20/2003	Biomechanical Results (Traynelis), Wear Testing Results (Traynelis)
Society for Biomatetrials	May-21	Sydney, AU	9/19/2003	Metal Matrix Composites (Medley)
CNS	Oct. 16-24	San Francisco	4/2/2004	Refining Indications (Haid), Tribology 101 (Haid) , Site Data (Argires), Site Data (Ceola)
NASS	Oct. 26-30	Chicago	2/10/2004	Refining Indication (Zdeblick), Wear Testing (Zdeblick), Biomechanical Testing (Zdeblick), IDE Site Results (Burkus) , MMC (Medley)
CSRS	Dec. 9-11	Boston	6/17/2004	Refining Indications (Zdeblick), Tribology 101 (Haid), IDE Site Data (Argires), Host response TiC (Traynelis)
Major OUS Meetings				
Australian Spine Society			1/1/2004 est	Primary Indication Study (McCombe)
Spineweek	5/30-6/5	Porto, Portugal	11/16/2003	Biomechanical Results (Haid), Wear Testing Results (Haid), Primary Indication Study (Porchet), Long Term Results (Gill)
IMAST	July 1-3	Bermuda	3/1/2004	Wear Testing (Traynelis), Biomechanical Testing (Haid), Refining Indications (Sasso), Session: Preserving Motion in the Diseased Cervical Disc: Traynelis - Chairman, Haid and Sasso - Faculty
Spine Arthroplasty Sociey	May 4-7	Vienna, Austria	1/4/2004	Biomechanical Results (Zdeblick), Wear Testing Results (Zdeblick) , Primary Indication Study (McCombe)
Non-Fusion Congress	Sep-11	Milan, Italy		
Latin American Neuro Congress				
Journal Submissons (to be published in 2004)				
SPINE				Artificial Disc Materials (Vacarro)
SPINE				Prestige Clinical History (Traynelis)
Neurosurgical Focus				Articles by Kim, Mummananeni, Foley, Vacarro

Cervical Arthroplasty Publications

BRYAN Clinical References

- Bryan V. **Cervical motion segment replacement.** *Euro Spine J* 2002;11(Suppl. 2):S92-S97. PMID:12384728 [PubMed- indexed for MEDLINE].
- Goffin J, Van Calenbergh F, von Loon J, Casey A, Kehr P, Liebig K, Lind B, Logroscino C, Sgrambiglia R, Pointillart V. **Intermediate follow-up after treatment of degenerative disc disease with the Bryan cervical disc prosthesis: single-level and bi-level.** *SPINE* 2003;28(24):2673-2678. PMID:14673368 [PubMed- in process].
- Goffin J, Casey A, Kehr P, Liebig K, Lind B, Logroscino C, Pointillart V, Van Calenbergh F, van Loon J. **Preliminary clinical experience with the Bryan cervical disc prosthesis.** *Neurosurgery* 2002;51(3):840-847. PMID:12188968 [PubMed- indexed for MEDLINE].
- Sekhon L. **Reversal of anterior cervical fusion with a cervical arthroplasty prosthesis.** *J Spinal Disorder Tech* 2004;00(0):000-000.
- Sekhon L. **Two-level artificial disc placement for spondylotic cervical myelopathy.** *J of Clinical Neuroscience* 2003;11(4):412-5. PMID:15080959 [PubMed- in process].
- Sekhon L. **Cervical arthroplasty in the management of spondylotic myelopathy.** *J of Spinal Disorders and Techniques* 2003;16(4):307-313. PMID:12902945 [PubMed- indexed for MEDLINE].

BRYAN Biomechanical/Design References

- Anderson P, Rouleau J, Bryan V, Carlson C. **Wear analysis of the Bryan cervical disc prosthesis.** *SPINE* 2003;8(20S):186-194. PMID:14560190 [PubMed- in process].

PRESTIGE Clinical References

- Wigfield C, Gill S, Nelson R, Metcalf N, Robertson J. **The new frenchay artificial cervical joint: results from a two-year pilot study.** *SPINE* 2002;27(22):2446-2452. PMID:12435973 [PubMed- indexed for MEDLINE].
- Wigfield C, Gill S, Nelson R, Langdon I, Metcalf N, Robertson J. **Influence of an artificial cervical joint compared with fusion on adjacent-level motion in the treatment of degenerative cervical disc disease.** *J Neurosurgery (Spine 1)* 2002;96:17-21. PMID:11795709 [PubMed- indexed for MEDLINE].

PRESTIGE Biomechanical/Design References

- Cummins B, Robertson J, Gill S. **Surgical experience with an implanted artificial cervical joint.** *J Neurosurgery* 1998;88:943-948. PMID:9609285 [PubMed- indexed for MEDLINE].
- DiAngelo D, Robertson J, Metcalf N, McVay B, Davis R. **Biomechanical testing of an artificial cervical joint and an anterior cervical plate.** *J of Spinal Disorders & Techniques* 2003;16(4):314-323. PMID:12902946 [PubMed- indexed for MEDLINE].
- Wigfield C, Skrzypiec D, Jackowski A, Adams M. **Internal stress distribution in cervical intervertebral discs: the influence of an artificial cervical joint and simulated anterior interbody fusion.** *J of Spinal Disorders* 2003;16(5):441-449. PMID:14526192 [PubMed- indexed for MEDLINE].

Historical Review of Cervical Arthroplasty

- Hoang Le, M.D., Issada Thongtrangen, M.D., & Daniel Kim, M.D.
- *Neurosurg Focus (17)3:E1, 2004.*
 - *“The historic progression of cervical arthroplasty is based on the clinical success encountered with hip, knee, and subsequently lumbar arthroplasty”*
 - *“If preliminary clinical outcomes from the use of cervical arthroplasty can match or surpass those of cervical arthrodesis, a new treatment standard in cervical disc disease will have emerged”*

The Future of Care in the Cervical Spine: Interbody Fusion and Arthroplasty

- Praveen Mummaneni, M.D. & Regis Haid M.D.
- *J Neurosurgery (Spine 1) 2:155-159, 2004*
 - *“The advantages (motion maintenance and potential improved clinical outcome) of arthroplasty outweigh its disadvantages”*
 - *“Implant wear, fatigue, and failure have been reported in cases of large-joint arthroplasty, and research is underway to limit these problems in cervical arthroplasty”*

The Future of Spinal Arthroplasty: A Biomaterial Perspective

- Rod J. Oskouian, M.D., Richard Withehill, M.D., Amir Samii, M.D., Mark E. Shaffrey, M.D., J. Patrick Johnson, M.D., & Christopher I. Shaffrey M.D.
- *Neurosurg Focus 17 (3):E2, 2004.*
 - *“With the emerging technology of spinal arthroplasty, a variety of new clinical problems may arise in the very near future”*
 - *“Meticulous clinical follow- up of these patients will be necessary to identify not only gross mechanical failure but also less obvious loosening associated with a debris-induced human response”*

Early Clinical and Biomechanical Results Following Cervical Arthroplasty

- Neil Duggal, M.D., M.Sc, F.R.C.S.(C), Gwynedd E. Pickett, M.D., F.R.C.S.(C), Demytra K. Mitsis, & Jana L. Keller, M.Sc.(EPI)
- *Neurosurg Focus 17(3): E9, 2004.*
 - *“Insertion of the Bryan Cervical Disc Prosthesis following anterior cervical discectomy appears to be safe and provides good preliminary clinical results”*
 - *“Computerized analysis of the ROM demonstrated that the Bryan Cervical Disc Prosthesis provides in vivo functional spinal motion”*
 - *“Long-term follow up is required”*

Effect of a Cervical Disc Prosthesis on Segmental and Cervical Spine Alignment

- Gwynedd E. Pickett, M.D., F.R.C.S.(C), Demytra K. Mitsis, Lali H. Sekhon, M.B.B.S. William R. Sears, M.B.B.S., F.R.A.C.S. & Neil Duggal, M.D., M.Sc, F.R.C.S.(C)
- *Neurosurg Focus, 17 (3):E5, 2004.*
- *“Kyphosis of the endplate shells of an implanted Bryan Cervical Disc prosthesis is common, and it is likely to be related to the angle of disc insertion or patient selection”*
- *“This produces focal segmental kyphosis, although global cervical alignment is preserved”*
- *“The ROM is maintained and neck disability is significantly reduced following insertion of the artificial disc”*

Long Term Outcome After Implantation of the Prestige I Disc in an End-Stage Indication: 4- Year Results from a Pilot Study

- James T. Robertson, M.D., & Newton H. Metcalf B.Sc.
- *Neurosurg Focus* 17(3): E10, 2004.
 - *“In this limited series we found significant patient improvement from pre-operative status in the clinical outcome measures used”*
 - *“The radiographic results demonstrate that the Prestige I device is capable of maintaining function at 4 years postoperatively without the development of adjacent segment disease”*

Clinical Outcomes With the Prestige II Cervical Disc: Preliminary Results from a Prospective Randomized Clinical Trial

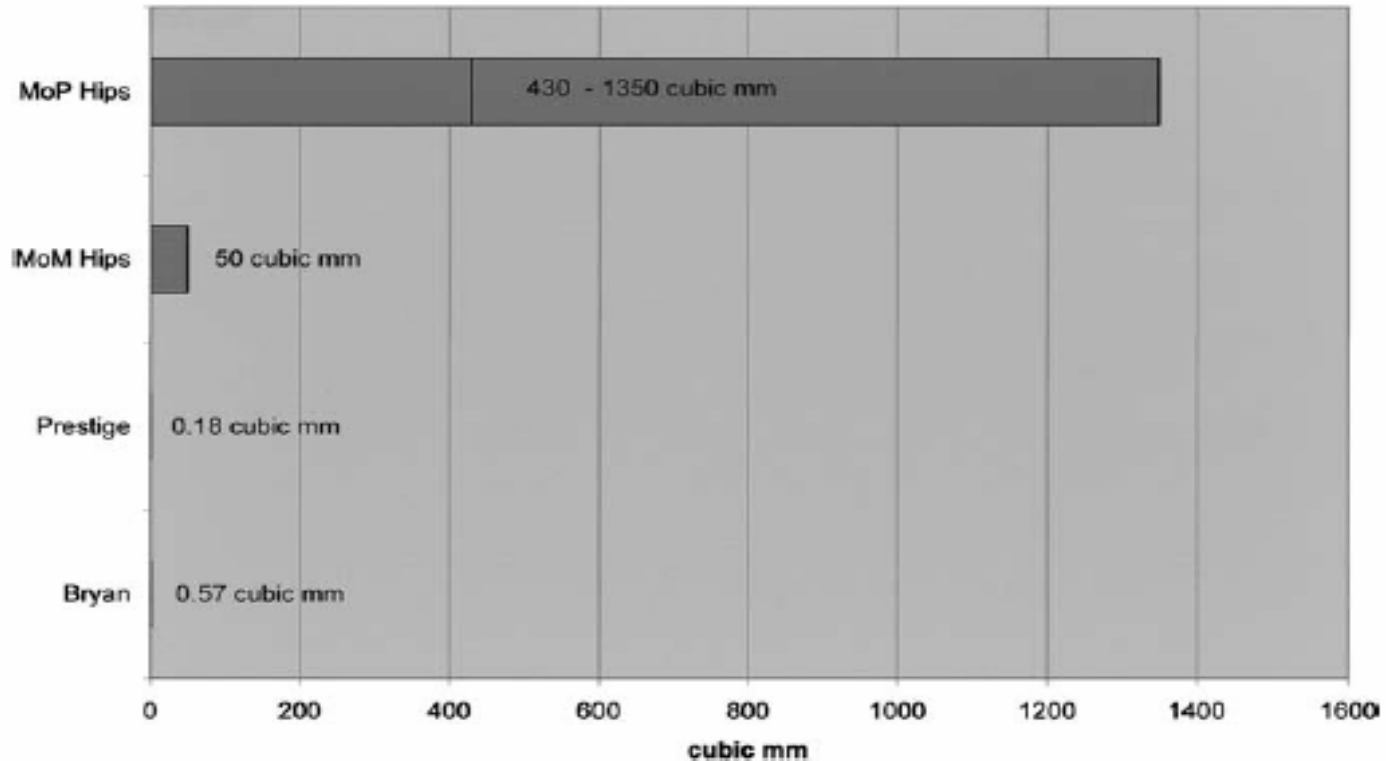
- Francois Porchet, M.D. & Newton H. Metcalf
- *Neurosurg Focus 17 (3): E6, 2004.*
- *“The only other cervical disc replacement device with prospective intermediate-term outcome data is the Bryan Cervical Disc System”*
- *“The clinical and radiographic results show that the Prestige II disc alleviates pain and symptoms comparably to fusion while maintaining motion at the treated level”*

A Comparison of Simulator –Tested and –Retrieved Cervical Disc Prosthesis

- Paul A. Anderson, M.D., Jeffrey P. Rouleau, PH.D., Jeffrey M. Toth, PH.D., & Daniel K. Riew, M.D.
- *J Neurosurgery (Spine 1) 2: 202-210, 2004.*
 - *“Revision rates were low, 0.3 and 1% for the Bryan and Prestige discs, respectively”*
 - *“These prostheses will be quite durable and wear resistant”*
 - *“We have at present only a limited and short-term in vivo data”*

Wear Comparison of Hip Implants and Cervical Discs

Volumetric Wear (10 year dose)



Cervical Arthroplasty: Material Properties

- Harvey E. Smith, M.D., David W. Wimberly, M.D., & Alexander R. Vaccaro
- *Neurosurg Focus* 17 (3), E3, 2004.
 - *“There is less bone stock in the cervical VB, and one will have considerably less latitude in tailoring bone cuts to fit a prosthesis”*
 - *“Limited bone stock as well as the proximity of the spinal canal, neural elements, and vascular structures will make revision disc arthroplasty a technically daunting procedure”*
 - *“As in the lumbar spine, it will be important to achieve as much coverage of the bone endplates as possible with the cervical prosthetic endplate...minimize the chance of subsidence of the prosthesis into the VB’s central cancellous bone”*

An Improved Biomechanical Testing Protocol for Evaluating Spinal Arthroplasty and Motion Preservation Devices in a Multilevel Cadaveric Cervical Model

- Denis J. DiAngelo, Ph.D., & Kevin T. Foley, M.D.
- *Neurosurg Focus* 17 (3): E4, 2004.
 - *“When evaluating the performance of disc arthroplasty or motion preservation devices, not only should the instrumented level be analyzed, but changes in the adjacent and remaining segments should be included in the analysis”*
 - *“The preferred testing protocol is one that most closely follows the in vivo pattern for all segments in the cervical spine”*
 - *“Application of pure-moment loading methods did not replicate the physiological response”*

In Vitro Biomechanics of Cervical Disc Arthroplasty with the Prodisc- C Total Disc Implant

- Denis J. DiAngelo, Ph.D, Kevin T. Foley, M.D., Brian R. Morrow, B.Sc., John S. Schwab, M.Sc., Jung Song,, Ph.D., John W. German, M.D., & Eve Blair B.Sc.
- *Neurosurg Focus 17 (3): E7, 2004.*
 - *“An improved testing protocol that replicated the in vivo motion behavior of the cervical spine was used to study the biomechanics of a disc prosthesis in vitro”*
 - *“For all modes of testing, use of an artificial disc prosthesis did not alter the motion patients at either the instrumented level or the adjacent segments compared with the harvested condition, **except in extension**”*
 - *“The Prodisc-C implant maintained the biomechanical integrity of the cervical spine”*

Biomechanical Testing of an Artificial Cervical Joint and an Anterior Cervical Plate

- Denis J. DiAngelo, James T. Robertson, Newton H. Metcalf, Bobby J. McVay, & R. Champ Davis
- *J Spinal Disorders and Techniques, Vol 16. , No. 4, pp 314-323.*
 - *“Use of an artificial cervical joint did not alter the motion patterns at either the instrumented level or the adjacent segments compared to the harvested condition for all modes of testing”*

Cervical Arthroplasty in the Management of Spondylotic Myelopathy: 18- Month Results

- Lali Sekhon, M.B., B.S., Ph.D, F.R.A.C.S.
- *Neurosurg Focus* 17 (3): E8, 2004.
 - *“Artificial cervical disc placement is a satisfactory management option for the treatment of cervical myelopathy after anterior cervical decompression, with good medium-term results”*
 - *“Recurrent stenosis is the feared complication that may potentially occur because arthrodesis has not been achieved, as is wear of the prosthesis over time”*
 - *“Balance needs to be looked at more rigorously”*