

# ISADOR H. LIEBERMAN BSc MD MBA FRCSC

Office Address:

Texas Back Institute  
6020 W Parker Road  
Suite 200, Plano, Texas, 75093

## MEDICAL LICENSES

Jun 1987-Present	General Medical License, The College of Physicians & Surgeons of Ontario
Jan 1993-2009	Certificate of Full Registration, General Medical Council, United Kingdom
Aug 1997-Present	Ohio State Medical License,
Mar 2002-Present	State of Illinois Medical License
Mar 2002-Present	Michigan State Medical License
Dec 2002-Present	Commonwealth of Pennsylvania Medical License
Apr 2003-Present	State of Connecticut Medical License
July 2003-Present	State of New York Medical License
Jan 2004-Present	State of California Medical License
Nov 2008-Present	State of Florida Medical License
Mar 2010-Present	State of Texas Medical License

## EDUCATION

### **Degrees, Diplomas and Certifications**

May 1981	<b>BSc</b> , University of Toronto
May 1982	<b>Honors BSc</b> , University of Toronto Graduated with "High Distinction"
May 1986	<b>MD</b> , University of Toronto, Faculty of Medicine
Jun 1986	<b>L.M.C.C.</b> , <i>Qualifying Exam</i> Medical Council of Canada
Jun 1987	<b>Certificate of Registration</b> , The Medical Council of Canada
Sep 1990	<b>Principles of Surgery Exam</b> , Royal College of Physicians & Surgeons of Canada,
Dec 1992	<b>FRCS(C)</b> , Fellow Royal College of Surgeons, Royal College of Physicians & Surgeons of Canada,
July 1999	<b>Medical Board Certification</b> , American Board of Orthopaedic Surgeons, <i>Part 1 &amp; 2 Orthopaedic Specialty Exam</i>
Dec 2002	<b>MBA</b> , Cleveland State University, James J. Nance College of Business Administration

## **Undergraduate Education**

Sept 1978 – May 1979

The University of Western Ontario,  
London Ontario Canada, *Natural Sciences program*

Sept 1979 – May 1982

The University of Toronto,  
Toronto Ontario Canada, *Arts & Sciences program*

## **Medical School**

Sept 1982 – May 1986

The University of Toronto,  
The Faculty of Medicine, Toronto Ontario Canada

## **Medical Internship**

Jun 1986 - Jun 1987

The Wellesley Hospital,  
Toronto Ontario Canada, *Comprehensive Surgery Intern*

## **Orthopaedic Specialty Training**

Jul 1987 - Jun 1988

Mount Sinai Hospital, Toronto  
*Orthopaedic Surgery Research Resident*

Jul 1988 - Jun 1989

Sunnybrook Health Science Centre, Toronto  
*Orthopaedic Surgery Resident*  
*Rotations in General Surgery, Neurosurgery & Orthopaedics*

Jul 1989 - Dec 1989

Toronto East General Hospital  
*Orthopaedic Surgery Resident*

Jan 1990 - Jun 1990

Sunnybrook Health Science Centre, Toronto  
*Orthopaedic Surgery Resident - Rotation in Surgical Intensive Care Unit*

Jul 1990 - Jun 1991

The Toronto Hospital - Western Division  
*Orthopaedic Surgery - Chief Resident*

Jul 1991 - Dec 1991

St. Michael's Hospital, Toronto  
*Orthopaedic Surgery - Chief Resident*

Jan 1992 - Jun 1992

Hospital for Sick Children, Toronto  
*Orthopaedic Surgery - Chief Resident*

## **Orthopaedic Fellowship Training**

Jul 1992 - Dec 1992

The Toronto Hospital - Western Division  
*Clinical fellow spine and trauma surgery*  
Supervisor: Dr. T.W. Wright FRCS(C)

Jan 1993 - Dec 1993

Queen's Medical Centre  
Nottingham, United Kingdom, *Clinical fellow spine surgery*  
Supervisor: Mr. J.K. Webb, FRCS

## **Other Post-Graduate Training**

Jan 2000 – Dec 2002

Masters in Business Administration  
Cleveland State University, Nance College of Business Administration

## **APPOINTMENTS**

### **University Appointments**

1983 - 1984	Anatomy Demonstrator, University of Toronto, Faculty of Medicine, Toronto, Canada
1987 - 1988	Anatomy Demonstrator, University of Toronto, Faculty of Medicine, Toronto, Canada
1992 – 1997	Examiner, Medical Council of Canada, Qualifying Exams
1994 - 1997	Lecturer, Department of Surgery, University of Toronto, Canada
2004 – 2010	Professor of Surgery, Cleveland Clinic Lerner College of Medicine at Case Western Reserve University, Cleveland, USA

### **Hospital Appointments**

1987 - 1989	Casualty Officer, Cobourg District Hospital, Cobourg, Ontario
1987 - 1989	Casualty Officer, Norfolk General Hospital, Simcoe, Ontario
1988 - 1989	Casualty Officer, Whitby General Hospital, Whitby, Ontario
1989 - 1992	Casualty Officer, Etobicoke General Hospital, Etobicoke, Ontario
Nov - Dec 1992	Locum Orthopaedic Surgeon, Branson Hospital, North York, Ontario
Nov - Dec 1992	Locum Orthopaedic Surgeon, York Central Hospital, Richmond Hill, Ontario
Jan 1994 – Dec 1997	Orthopaedic & Spinal Surgeon, The Toronto Hospital, Western Division, Toronto, Ontario
Aug 1997 – Feb 2010	Orthopaedic & Spinal Surgeon, Cleveland Clinic Foundation, Cleveland, Ohio
Oct 2008 – Feb 2010	Orthopaedic & Spinal Surgeon, Chairman, Medical Interventional & Surgical Spine Center Cleveland Clinic Florida, Weston, Florida
March 2010 – Present	Orthopaedic & Spinal Surgeon Texas Back Institute, Plano, Texas
March 2010 – Present	Orthopaedic & Spinal Surgeon Medical Director Scoliosis & Spine Tumor Program Texas Health Resource Hospital, Plano, Texas

## **CLEVELAND CLINIC COMMITTEE INVOLVEMENT**

### **Cleveland Clinic Foundation, Hospital Committees**

- Patient Satisfaction Committee, Member, 1999 – 2000
- MISC Operations Committee, Member, 1998 – present
- Spine Center Database Committee, Member, 2000 – present
- Spine OR Pricing Committee, Member, 2000 –2003
- Neurology Chairman Review Committee, Member, 2000
- International Center Strategic Advisory Board, Member, 2002-2006
- World Class Service, Ortho/Spine/Neuro Continuum of Care Committee, **Team Leader**, 2002-2005
- Marketing committee of the Board of Trustees, Member, 2003 – 2009
- Conflict of Interest Committee, Member, 2003 – 2009
- Cost Restructuring Committee, Member, 2005 - 2006
- General Internal Medicine Chairman Review Committee, Chairman, 2005
- Committee for Responsible Research Conduct, Member, 2006 – 2007
- Patient Publication System Advisory Board, Member, 2006 – 2007
- New Product Committee, Surgical Services, Member, 2006 – 2009
- Cardiothoracic Anaesthesia Chairman Review Committee, Chairman, 2007
- Cardiothoracic Anaesthesia Chairman Search Committee, Chairman, 2007
- Division of Anaesthesia Chairman Search Committee, Chairman, 2007
- Operating Room Operations Committee, Florida, Member, 2008 – 2009
- Medical Student Committee, Florida, Member, 2008 – 2009
- Surgery Peer Review Committee, Florida, Member, 2008 – 2009
- CME committee, Florida, Member, 2008 –2009

### **Cleveland Clinic Foundation, Administrative Appointments**

- **Director**; Center for Advanced Skills Training, 2003 - 2007
- **Director**; Minimally Invasive Surgery Center, 2004 – 2006
- **Chairman**, Medical Interventional & Surgical Spine Center, Cleveland Clinic Florida, 2008 – 2009
- **Director**; Continuing Medical Education Department, 2009

### **Cleveland Clinic Foundation, Elected Appointments**

- **Board of Governors**; member, Jan 2005 – Dec 2008
- **Board of Trustees**; member, Jan 2008 – Dec 2008

## **OTHER COMMITTEE INVOLVEMENT**

### **University of Toronto, Faculty of Medicine Committees**

- Faculty of Medicine, Men's Athletic Association, President, 1984 - 1985
- Faculty of Medicine, Undergraduate Medical Society, Member, 1984 - 1985
- University of Toronto, Intramural Athletic Association, Member, 1984-1985
- Faculty of Medicine, Undergraduate Medical Society, Member, 1985 - 1986

### **University of Toronto, Department of Surgery Committees**

- Orthopaedic Residency Curriculum Committee, Member, 1990 - 1991

### **The Toronto Hospital, Hospital Committees**

- Medical Advisory Committee, Member, 1990 - 1991
- Spinal Program Committee, Member, 1994 - 1997
- MRI Resource Allocation Committee, Member, 1995 - 1997
- Toronto Hospital Spinal Program, Medical Director Business Unit, 1997

### **AO/ASIF North American, Spine Education Committee**

- MISS/Cage/Image Guided Surgery Working Group, *Chairman*, 1999 – 2001

### **North American Spine Society**

- Surgical Care Committee, Member, 2001 – 2003
- Operative Coding Committee, *Vice Chairman*, 2002 – 2005
- Surgical Care Committee, *Chairman*, 2003 – 2004
- Multi-disciplinary Patient Care Committee, *Chairman*, 2004- 2007

### **American Academy of Orthopaedic Surgeons**

- Adult Spine Evaluation Subcommittee, Member, 2006 – present
- Maintenance of Certification Course Committee, Co-Chairman, 2009 - present

### **Scoliosis Research Society**

- Global Outreach Committee, Member, 2006 - 2009

### **Spine Arthroplasty Society**

- Public Policy Review Committee, Member, 2007 – present

## **MEDICAL/SCIENTIFIC ORGANIZATIONS-MEMBERSHIPS**

- American Academy of Orthopaedic Surgeons
- Canadian Orthopaedic Association
- North American Spine Society
- Scoliosis Research Society
- Royal College of Physicians and Surgeons of Canada
- European Spine Society
- World Spine Society
- Macnab Orthopaedic Research Society
- Mid America Orthopaedic Association
- Spine Arthroplasty Society

## **CHARITABLE ORGANIZATIONS – MEMBERSHIP AND ACTIVITIES**

- Orthopaedic Research and Education Foundation, **Shand's Circle**, Member
- Health Volunteers Overseas, Orthopaedic Overseas, **Surgeon's Circle**, Member
- Health Volunteers Overseas, Orthopaedic Overseas, Member Nominating Committee, 2009-2010
- American Technion Society, Cleveland Chapter, Member Board of Directors, 2006 - 2008
- Spine Surgery Charitable Mission, Uganda, May 2006
- Spine Surgery Charitable Mission, Uganda, March 2007
- Spine Surgery Charitable Mission, Uganda, January 2008
- Spine Surgery Charitable Mission, Uganda, July 2009
- Spine Surgery Charitable Mission, Uganda, August 2010

## **CLINICAL AND APPLIED BASIC RESEARCH**

- Development and evaluation of endoscopic/minimally invasive spinal surgery techniques
- Clinical outcome studies in spinal surgery
- Development and evaluation of spinal instrumentation and implants
- Biomechanics of spinal implants

## **PRACTICE INTERESTS AND AREAS OF SUBSPECIALIZATION**

Orthopaedic and Spinal Surgery  
Endoscopic & Minimally Invasive Spinal Surgery  
Adult Spinal Deformity Reconstruction (idiopathic scoliosis, kyphosis, spondylolisthesis)  
Adolescent Spinal Deformity Reconstruction (idiopathic scoliosis, kyphosis, spondylolisthesis)  
Spinal Tumour Reconstruction  
Spinal Trauma Reconstruction  
Osteoporosis  
Multiple Myeloma  
Vertebral compression fractures  
Disc Arthroplasty

## **HONOURS AND AWARDS RECEIVED**

- 1) Innis College Letter for Athletic Achievement. 1982
- 2) Rhea V. Scott Scholarship for Academic Achievement. 1982
- 3) Walter F. Watkins Scholarship for Academic Excellence. 1983
- 4) Faculty of Medicine Letter for Athletic Achievement. 1984
- 5) Faculty of Medicine Athletic Achievement Award. 1985
- 6) University of Toronto Intramural "T" Award. 1985
- 7) Robin Sullivan Award for Best Research Paper, University of Toronto, Orthopaedic Research Day. 1988
- 8) Accepted "Life Member" of the National Registry of Who's Who, published in the 2001 edition
- 9) Video Presentation Award Winner, American Academy of Orthopaedic Surgeons Annual Meeting 2004.  
"Translaminar Screw Fixation".
- 10) Clinical Science Award for Best Poster, Spine Society of Europe Annual Meeting 2004.  
"Clinical Outcome of Vertebral Augmentation for Osteolytic Collapse".
- 11) Cleveland Clinic Foundation Innovators Award, 2004, multiple patents
- 12) Cleveland Clinic Foundation, World Class Service Award of Excellence, 2005
- 13) Cleveland Clinic Foundation Innovators Award, 2005, multiple patents
- 14) Cleveland Clinic Foundation Innovations Recognition Award, 2005, Merlot OrthopediX Inc.
- 15) Dr. Arthur Bloomfield Award for Excellence in Medical Education. The American Academy of Continuing Medical Education. Middle East Spine Symposium. Arab Health Congress January 2006.
- 16) Cleveland Clinic Foundation Innovators Award, 2006, multiple patents
- 17) Listed in "Best Doctors in America" Registry, published in 2008.
- 18) Cleveland Clinic Foundation Innovators Award, 2007, multiple patents
- 19) Listed in "America's Top Surgeons", Registry, published in 2008.
- 20) Cleveland Clinic Foundation Innovators Award, 2008, multiple patents
- 21) Listed in "Best Doctors in America" Registry, published in 2009 - 2010.
- 22) Cleveland Clinic Foundation Innovators Award, 2009, multiple patents
- 23) Cleveland Clinic Foundation Innovations Award, 2009, P.K. Ranney Foundation New Product Award

## **BOOKS EDITED, EDITORSHIPS & PUBLICATION REVIEW BOARDS**

*Minimal Access Spine Surgery*, Textbook of spinal surgery,  
Publisher: Quality Medical Publishing, Editors; Regan & Lieberman, 2003

*Advances in Osteoporotic Fracture Management*,  
Publisher; REMEDICA Publishers, Senior Editor; Lieberman, 2003 - 2007

*The Spine Journal*, Publisher: Elsevier, Editor; Branch, 2003 - 2009  
Member associate editorial board

*Spine*, Publisher; Lippincott Williams & Wilkins, Editor; Weinstein,  
Member associate editorial board

*Journal of Spinal Disorders & Techniques*, Publisher: Lippincott Williams & Wilkins, Editor; Zdeblick,  
Member editorial review board

*European Spine Journal*, Publisher: Springer, Editor; Aebi  
Member assistant editorial board

*Journal of Spine Arthroplasty Society*, Publisher: Elsevier, Editor; Yuan,  
Reviewer

*Journal of Bone and Joint Surgery*, Publisher; JBJS Inc, Editor; Heckman  
Reviewer

*SpineUniverse.com*, Editor; Eidelson,  
Member editorial board

## **PUBLICATIONS**

**PA-Principal Author; SRI-Senior Responsible Investigator; CPA-Co-Principal Author; C-Collaborator**

### **Peer Reviewed - Journal Publications**

1. Grynbas MD, **Lieberman IH, et al**: Subchondral bone in osteoarthritis. *Calcified Tissue International*, 49: pp 20-26, 1991. **C**
2. Ogilvie-Harris DJ, **Lieberman IH**: Arthroscopically assisted arthrodesis for osteoarthritic ankles. *Journal of Bone and Joint Surgery*, 75A: pp 1167-1174, 1993. **C**
3. **Lieberman IH**, Hastings D, Bogoch ER: Heterotopic ossification after primary cemented and cementless total hip arthroplasty involving patients with rheumatoid arthritis and osteoarthritis. *Canadian Journal of Surgery*, 37(2), 1994. **PA**
4. **Lieberman IH**, Webb JK: Cervical spine injuries in the elderly: The last ten years in Nottingham. *Journal of Bone and Joint Surgery*, 76B: pp 877-881. 1994. **PA**
5. Webb JK, Burwell RG, Cole AA, **Lieberman IH**: Posterior instrumentation in scoliosis. *European Spine Journal*, Vol 4, No 1, pp 2-5, 1995. **CPA**
6. Catre M, **Lieberman IH**: Laterally based skin flap for below knee amputation. *Journal of Trauma*, Vol 43, No 5, pp 869-871, 1997. **SRI**
7. **Lieberman IH**, Khazim R, Woodside T: Anterior vertebral body screw pull out testing: A comparison of Zielke, Kaneda, Universal spine system, and Universal spine system with pull out resistant nut. *Spine*, Vol 23, No 8, pp 908-910, April 1998. **PA**
8. **Lieberman IH**, Salo PT: Thoracoscopic Techniques for Deformity Surgery. In: *Seminars in Spine Surgery*, Editor: Hu, Publisher: W.B.Saunders, Dec. 1998. **PA**
9. **Lieberman IH**, Webb JK: Occipito-cervical fusion using posterior titanium plates. *European Spine Journal*, Vol 7, No 4, pp 308-312, 1998. **PA**
10. **Lieberman IH**, Willshir PC, Salo PT, Litwin DEM, Kraetschmer BG: Transperitoneal Laparoscopic Exposure for Lumbar Interbody Fusion. *Spine*, Vol 25, No 4, pp 509-514, 2000. **PA**
11. **Lieberman IH**, Salo PT, Orr RD, Kraetschmer BG: Prone position endoscopic transthoracic release with simultaneous posterior instrumentation for spinal deformity; A Description of the Technique. *Spine*, Vol 25, No 17, pp 2251-2257, 2000. **PA**
12. McLain RF, **Lieberman IH**: Current Controversies, "Endoscopic approaches to metastatic thoracic disease". *Spine*, Vol 25, No 14, pp 1855-1858, 2000. **CPA**
13. Heniford T, Mathews BD, **Lieberman IH**: Laparoscopic Lumbar Interbody Fusion. *Surgical Clinics of North America*, Vol 80, No 5, pp 1487-1500, 2000. **CPA**
14. Gill I, Meraney AM, Thomas JC, Sung GT, Novick AC, **Lieberman IH**: Thoracoscopic transdiaphragmatic adrenalectomy: The initial experience. *J Urol*, 165;1875-1881, Jun 2001. **C**
15. **Lieberman IH**, Dudeney S, Reinhardt M-K, Bell G: Initial Outcome and Efficacy of Kyphoplasty in the Treatment of Painful Osteoporotic Vertebral Compression Fractures. *Spine*, Vol 26, No 14, pp 1631-1637, 2001. **PA**

16. **Lieberman IH**, Kuzhupilly RR, Reinhardt M-K, Davros WJ: 3-D CT volume rendering techniques in endoscopic thoracoplasty. *The Spine Journal*, Vol 1, No 6, pp 390-394, Nov/Dec 2001. **PA**
17. Phillips F, Ronjon P, **Lieberman IH**: Kyphoplasty for the treatment of osteoporotic and osteolytic vertebral compression fractures. *Adv Osteo Fracture Management*, Vol 1, No 1, pp 7-11, 2001. **CPA**
18. Brody F, Rosen M, Tarnoff M, **Lieberman IH**: Laparoscopic lateral L4/L5 disc exposure. *Surg Endosc*, 16;650-653, 2002. **C**
19. Dudeney S, **Lieberman IH**, Reinhardt MK, Hussein M: Kyphoplasty in the treatment of osteolytic vertebral compression fractures as a result of multiple myeloma. *J Clin Oncol*. 20:9, 2382-2387, May 2002. **CPA**
20. Kuzhupilly R, **Lieberman IH**, McLain R, Valdevit A, Kambic H, Richmond BJ: In vitro stability of FRA spacers with integrated crossed screws for anterior lumbar interbody fusion. *Spine*, Vol 27, No 9, 923-928, 2002. **CPA**
21. Hussein MA, Juturi JV, **Lieberman IH**: Multiple Myeloma: present and future. *Curr Opin Oncol*, 14(1):31-35, Jan 2002. **C**
22. Phillips F, Wetzel T, **Lieberman IH**, Campbell-Hupp M: An in vitro comparison of the potential for extra-vertebral cement leak after vertebroplasty or kyphoplasty. *Spine*, Vol 27, No 19, 2173-2179, 2002. **C**
23. Togawa D, Bauer T, **Lieberman IH**, Lowery G, Takikawa S: Histology of Tissues Within Retrieved Human Titanium Mesh Cages. *Spine*, Vol 28, No 3, 246-254, 2003. **C**
24. **Lieberman IH**, Reinhardt, MK: Vertebroplasty and Kyphoplasty for Osteolytic Collapse. *Clin Orthop*. (415 Suppl), S176-86, Oct, 2003. **PA**
25. Coumans JV, Reinhardt MK, **Lieberman IH**: Treatment of Vertebral Compression Fractures with Kyphoplasty: one year clinical outcomes from a prospective study. *J of NeuroSurg*, (Spine 1), 99:44-50, 2003. **CPA**
26. Togawa D, Bauer T, **Lieberman IH**, Takikawa S: Histologic Evaluation of Human Vertebral Bodies After Vertebral Augmentation with Polymethylmethacrylate. *Spine*, Vol 28, No 14, 1521-1527, 2003. **CPA**
27. Togawa D, Bauer T, **Lieberman IH**, Sakai H: Lumbar Intervertebral Body Fusion Cages: Histological Evaluation of clinically failed cages retrieved from Humans. *J Bone Joint Surg*, 86A: 70-79, 2004. **CPA**
28. Kayanja MM, Ferrara LA, **Lieberman IH**: Distribution of Anterior Cortical Shear Strain After a Thoracic Wedge Compression Fracture. *The Spine Journal*, Vol 4, Issue 1, pp 76-87, 2004. **CPA**
29. Harrop EJ, **Lieberman IH**, Reinhardt MK: Primary and Secondary Osteoporosis; Incidence of Subsequent Vertebral Compression Fractures after Kyphoplasty. *Spine*, Vol 29, No 19, pp 2120-2125, 2004. **CPA**
30. **Lieberman IH**: Disc Bulge Bubble; Spine Economics 101. *The Spine Journal*, 4(2004) 609-613, 2004. **PA**
31. **Lieberman IH**, Phillips F, Togawa D, Modic M, Masaryk T, Obuchowski N, Slipman CW: Vertebral Augmentation and the Limits of Interpreting Complications Reported in the Food and Drug Administration Manufacturer and User Facility Device Experience Database. *J Vasc Interv Radiol*, 2004; 15: 1193-1196. **PA**
32. DalCanto RA, **Lieberman IH**, Inceoglu S, Kayanja MM, Ferrara LA: Biomechanical comparison of transarticular facet screws to lateral mass plates in two level instrumentations of the cervical spine. *Spine*, Vol 30, No 8, 897-902, 2005. **CPA**
33. Togawa D, Bauer T, Reinhardt MK, **Lieberman IH**: Histological Evaluation of Biopsies Obtained From Vertebral Compression Fractures - Unsuspected Myeloma And Osteomalacia. *Spine*, Vol 30, No 7, pp781-786, 2005. **CPA**

34. Keller TS, Kosmopoulos V, **Lieberman IH**: Vertebroplasty and Kyphoplasty affect vertebral motion segment stiffness and stress distribution: A microstructural finite element study. *Spine*, Vol30, No 11, 11258-1265, 2005. **C**
35. Kayanja MM, Togawa D, **Lieberman IH**: Biomechanical changes following the augmentation of experimental osteoporotic vertebral compression fractures in the cadaveric thoracic spine. *The Spine Journal*, Vol 5; 55-63, 2005. **CPA**
36. **Lieberman IH**, Talmadge K: Kyphoplasty for Women with Compression Fractures. *Clin Rev Bone Min Met*, Vol 3, No 2, 2005. **PA**
37. Kobayashi N, Bauer TW, Togawa D, **Lieberman IH**, Sakai H, Fujishiro T, Tuohy MJ, Procop GW: A Molecular Gram Stain using Broad Range PCR and Pyrosequencing Technology. *Diag Mol Pathol*, Jun; 14(2):83-89, 2005. **C**
38. **Lieberman IH**, Kayanja MM, Togawa D: Vertebroplasty and Kyphoplasty – Filler Materials. *The Spine Journal*, Vol 5, No 6S, pp 305S-316S Nov/Dec 2005. **PA**
39. Khanna AJ, Neubauer P, Togawa D, Reinhardt MK, **Lieberman IH**: Kyphoplasty and Vertebroplasty for the Treatment of Spinal Metastases. *Supportive Cancer Therapy*. *Support Cancer Ther* 3(1):21-25, 2005. **SRI**
40. Kayanja M, Evans K, Milks R, **Lieberman IH**. The mechanics of polymethylmethacrylate augmentation. *Clin Orthop Relat Res*. 2006 Feb;443:124-30. **SRI**
41. Kayanja MM, Schlenk R, Togawa D, Ferrara L, **Lieberman IH**: Biomechanics of single, double and triple augmentation patterns in the cadaveric thoraco-lumbar spine. *Spine*. 2006 Apr 1;31(7):769-74. **SRI**
42. Lewandrowski KU, McLain RF, **Lieberman I**, Orr D: Cord and cauda equina injury complicating elective orthopedic surgery. *Spine*. 2006 Apr 20;31(9):1056-9. **CPA**
43. Togawa D, **Lieberman IH**, Khanna AJ, Reinhardt MK: Kyphoplasty in the United States - clinical results in the Cleveland Clinic - . *Rinsho Seikei Geka (Clinical Orthopaedic Surgery)* 2005; 40(9): 1004-1013. (Japan). **CPA**
44. Togawa D, Kovacic J, Reinhardt MK, Bauer T, Brodke D, **Lieberman IH**: Radiographic and Histologic Findings of vertebral augmentation using Polymethylmethacrylate in the Primate Spine – Percutaneous Vertebroplasty versus Kyphoplasty. *Spine*, Vol 31, No 1, pp E1-E3, 2006. **SRI**
45. Togawa D, Kayanja MM, **Lieberman IH**: Percutaneous vertebral augmentation for osteoporotic and osteolytic compression fractures. *Int J Spine Surg*. 2006, [www.ispub.com/ostia/index.php?xmlFilePath=journals/ijss/vol1n2/vertebral.xml](http://www.ispub.com/ostia/index.php?xmlFilePath=journals/ijss/vol1n2/vertebral.xml) **SRI**
46. Khanna AJ, Reinhardt MK, Togawa D, **Lieberman IH**: Functional outcomes of kyphoplasty for the treatment of osteoporotic and osteolytic vertebral compression fractures. *Osteop Int*. Jun;17(6):817-26. Epub Mar 4, 2006. **SRI**
47. Kobayashi N, Bauer TW, Togawa D, **Lieberman IH**, Sakai H, Fujishiro T, Procop GW: The use of newly real-time PCR for the rapid identification of bacteria in culture-negative osteomyelitis. *Joint Bone Spine*. 73, 745-47, 2006. **C**
48. Berglund RK, Lyden SP, Tsai EC, **Lieberman I**, Klein EA. Nonseminomatous Germ Cell Tumor after Chemotherapy with Residual Mass Invading the Spine. *Eur Urol*. 2006 Aug;50(2):372-4. **C**
49. Berglund RK, Lyden SP, Tsai EC, **Lieberman I**, Klein EA. Nonseminomatous germ cell tumor after chemotherapy with residual mass invading the spine: part 2. *Eur Urol*. 2006 Sep;50(3):607-8. **C**

50. **Lieberman IH**, Togawa D, Kayanja MM, Reinhardt MK, Friedlander A, Knoller N, Benzel E: Bone-Mounted Miniature Robotic Guidance For Pedicle Screw and Translaminar Facet Screw Placement; Part I - Technical Development and a Test Case Result. *NeuroSurg.* Vol 59, No 3, pg 641-650, Sept 2006. **PA**
51. Togawa D, **Lieberman IH**, Kayanja MM, Reinhardt MK, Friedlander A, Knoller N, Shoham M, Balter A, Benzel E: Bone-Mounted Miniature Robotic Guidance For Pedicle Screw and Translaminar Facet Screw Placement; Part II – Evaluation of System’s Accuracy. *Neurosurgery.* 60(2) Operative Neurosurgery Supplement 1:129-139, February 2007. **CPA**
52. Kayanja M, Evans K, Milks R, **Lieberman IH**: Adjacent level load transfer following vertebral augmentation in the cadaveric spine. *Spine.* Vol 31, No 21, E790-797, 2006. **SRI**
53. Kobayashi N, Bauer TW, Tuohy MJ, **Lieberman IH**, Krebs V, Togawa D, Fujishiro T, Procop GW: The Comparison of Pyrosequencing Molecular Gram Stain, Culture and Conventional Gram Stain for Diagnosing Orthopaedic Infections. *J Orthop Res* 24:1641-1649, 2006. **C**
54. Mroz T, Yamashita T, Davros W, **Lieberman IH**: Radiation exposure to the surgeon and the patient during kyphoplasty. *JSDT.* Vol.21, No.2, April, 2008. **SRI**
55. Jones A, Butler J, **Lieberman IH**, Schlenk R: Negative-pressure wound therapy in the treatment of postoperative spinal wound infections: Beware of complications associated with the Vacuum-Assisted Closure (VAC) system. *J Neurosurg Spine* 6:407–411, 2007. **C**
56. Jones A, Kayanja M, Milks R, **Lieberman IH**: Biomechanical characteristics of hybrid hook-screw constructs in short-segment thoracic fixation. *Spine*, Vol 33, No 2, pp 173–177, 2008. **SRI**
57. Shoham, M., **Lieberman, I. H.**, Benzel, E. C., Togawa, D., Zehavi, E., Zilberstein, B., Roffman, M., Bruskin, A., Fridlander, A., Joskowicz, L., Brink-Danan, S. and Knoller, N. , 'Robotic assisted spinal surgery-from concept to clinical practice', *Computer Aided Surgery*, 12:2, 105 – 115, 2007, **CPA**
58. Siemionow K, **Lieberman IH**: T1 kyphoplasty for myeloma, case report. Submitted for review, *Journal of Spinal Disorders and Techniques*, 2007, **CPA**
59. Siemionow K, **Lieberman IH**: Polymethylmethacrylate augmentation of peri-acetabular osteolytic lesions. *Current Orthopaedic Practice*, Vol 19, No 5, Sept/Oct 2008. **CPA**
60. Mroz TE, Joyce MJ, Steinmetz MP, **Lieberman IH**, Roberts M, Wang JC: Musculoskeletal Allograft Risks and Recalls in the United States. *J Am Acad Orthop Surg*, 2008; 16:559-565. **C**
61. DalCanto R, **Lieberman IH**: Multiple cement application cavity containment kyphoplasty: technique description and efficacy. In print, *Am J Ortho*, 2008, **CPA**
62. Mroz TE, Joyce MJ, Steinmetz MP, **Lieberman IH**, Benzel E, Wang JC: The use of allograft bone in spine surgery; is it safe? *Spine J.* 2009; 9: 303-8, **C**
63. Abdullah K, Mroz TE, Steinmetz MP, Wang J, Klineberg E, **Lieberman IH**: Radiation exposure to the surgeon during percutaneous pedicle screw placement. In print, *Journal of Spinal Disorders and Techniques*, 2010, **C**
64. Yamashita T, Siemionow K, Mroz TE, **Lieberman IH**: A Prospective Analysis of Prognostic Factors in Patients with Spinal Metastases - Use of the Revised Tokuhashi Score. In print, *Spine*, 2010, **SRI**
65. Mariscalco M, Yamashita T, Steinmetz M, Krishnaney A, **Lieberman IH**, Mroz T: Radiation Exposure to the Surgeon During Open Lumbar Microdiscectomy and Minimally Invasive Microdiscectomy: A Prospective Controlled Trial. In print, *The Spine Journal*, 2009, **C**

67. Silverstein M, Mac Millan M, **Lieberman IH**: Computer-Guided Verses Fluoroscopic Kyphoplasty: Comparison of Procedure Time, Patient Radiation Dose, Physician Radiation Exposure, and Accuracy of Delivery. In print, Evidenced Based Spine Care Journal, 2010, **C**
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69. Siemionow K, **Lieberman IH**, et al. Intraoperative fluid therapy and pulmonary complications: a review of 1307 spinal procedures. In review, Spine, 2010, **CPA**
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49. Togawa D, **Lieberman IH**, McLain RF, Richmond BJ, Fleming JE, Reinhardt, MK. Clinical and radiographic outcomes of lumbar interbody fusion using allograft enriched with bone marrow derived cells prepared by selective stem cell retention. Trans. of the 19<sup>th</sup> annual meeting of North American Spine Society, Chicago, 2004.
50. Togawa D, **Lieberman IH**, McLain RF, Fleming JE, Richmond BJ, Reinhardt MK, Boehm C, Muschler GF. Efficacy of selective stem cell retention for bone marrow aspirates – clinical and radiographic results of lumbar interbody fusion. Trans. of Bone Summit 2004, Cleveland, 2004.
51. Wang J, Youssef J, **Lieberman IH**, Brodke D, Laurysen, Haynesworth S, Muschler GF. A prospective multi-center study of selective osteoprogenitor cell retention for enhancement of lumbar spinal fusion. Trans. of the 12<sup>th</sup> International Meeting on Advanced Spine Techniques, Banff, Canada, 2005.
52. Togawa D, Glaser JA, Merritt J, O'Dell J, Schlenk R, Wildstein M, Reinhardt MK, **Lieberman IH**. Vertebral height measurements restored by positioning, inflation of bone tamp, and cement deposition during kyphoplasty; blinded sagittal angle and un-blinded index level measurements. Trans. of the 12<sup>th</sup> International Meeting on Advanced Spine Techniques, Banff, Canada, 2005.
53. Bae H, Maurer P, Peppelman W, Beutler W, Linovitz R, Westerlund E, Peppers T, **Lieberman IH**, Kim C. Clinical experience using a novel bio-composite for treating vertebral compression fractures in vertebroplasty and kyphoplasty; report on the first forty patients. Trans. of the 12<sup>th</sup> International Meeting on Advanced Spine Techniques, Banff, Canada, 2005.
54. Togawa D, **Lieberman IH**, Benzel E, Kayanja M, Reinhardt MK, Zahavi E. Bone mounted miniature robot for spinal surgery. Accurate insertion for pedicle screws and translaminar facet screws in cadaveric experiments. Trans. of the 12<sup>th</sup> International Meeting on Advanced Spine Techniques, Banff, Canada, 2005.
55. Lee YP, Togawa D, Rosneck J, **Lieberman IH**. Efficacy of pull-out resistant nuts in preventing screw pullout in anterior spinal fusion in adolescent idiopathic and adult scoliosis. Trans. of the 12<sup>th</sup> International Meeting on Advanced Spine Techniques, Banff, Canada, 2005.
56. **Lieberman IH**, Togawa D, Khanna AJ, Reinhardt MK, Stefancin J, Holman P: Clinical results of Kyphoplasty for Osteoporotic and Osteolytic Vertebral Compression Fractures. Proceedings of World Spine III Interdisciplinary Congress on Spine Care, Rio de Janeiro, Brazil, August 2005.

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63. Togawa D, Kayanja M, Benzel E, Reinhardt MK, Knoller N, Friedlander A, **Lieberman IH**. Bone mounted miniature robotic guidance for pedicle and translaminar facet screw placement. Proceeding AAOS 26th annual meeting. March 2006, Poster 368, pp 721.
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65. Mroz T, Yu W, Melillo A, **Lieberman IH**. Difference of x-ray versus MRI in detecting and quantifying lumbar spondylolisthesis. Trans. of the 13<sup>th</sup> International Meeting on Advanced Spine Techniques, Athens, Greece, 2006.
66. **Lieberman IH**, Yamashita T, Tsai E, Kayanja M, Milks R. The biomechanics of sacral insufficiency fractures. Trans. of the 13<sup>th</sup> International Meeting on Advanced Spine Techniques, Athens, Greece, 2006.
67. Yamashita T, Kayanja M, Milks R, **Lieberman IH**. Radiographic landmarks of the sacrum. Trans. of the 13<sup>th</sup> International Meeting on Advanced Spine Techniques, Athens, Greece, 2006.
68. Shen M, Bae H, **Lieberman IH**, et al. Clinical experience using a novel bio-ceramic for treating vertebral compression fractures with one to two year follow-up. Proceedings of the North American Spine Society 21<sup>st</sup> Annual Meeting. The Spine Journal Sept/Oct, Vol 6, No 5S, Pg 27S.
69. Mroz T, **Lieberman IH**, Yamashita T, Davros W. Radiation exposure to the patient and surgeon during kyphoplasty. Proceedings of the North American Spine Society 21<sup>st</sup> Annual Meeting. The Spine Journal Sept/Oct, Vol 6, No 5S, Pg 52S.

70. Kayanja M, **Lieberman IH**, Yamashita T, Tsai E, Milks R. The biomechanics of insufficiency fractures and augmentation of the sacrum. Proceedings of the North American Spine Society 21<sup>st</sup> Annual Meeting. The Spine Journal Sept/Oct, Vol 6, No 5S, Pg 96S.
71. Mroz T, **Lieberman IH**, Yu W, Melillo A, Tozzi J. Difference of x-ray versus MRI in detecting and quantifying lumbar spondylolisthesis. Proceedings of the North American Spine Society 21<sup>st</sup> Annual Meeting. The Spine Journal Sept/Oct, Vol 6, No 5S, Pg 151S.
72. Yamashita T, Kayanja M, Milks R, **Lieberman IH**. Radiographic landmarks of the sacrum. Proceedings of the North American Spine Society 21<sup>st</sup> Annual Meeting. The Spine Journal Sept/Oct, Vol 6, No 5S, Pg 152S.
73. Mroz T, **Lieberman IH**, Yamashita T, Davros W. Radiation exposure to the patient and surgeon during kyphoplasty. Trans. of the 41<sup>st</sup> annual meeting of Scoliosis Research Society 2006, Monterey, CA, USA
74. Mroz T, **Lieberman IH**, Yamashita T, Davros W. Radiation exposure to the patient and surgeon during kyphoplasty. Proceeding AAOS 27th annual meeting. March 2007.
75. **Lieberman IH**, Hardenbrook M, Deitl R, et al. Experience with miniature robot for spinal surgery: 67 cases. Proceedings of World Spine IV, Istanbul, Turkey, July 2007, paper 120, pg 89.
76. Diulis C, Lee Y, Reinhardt MK, **Lieberman IH**. Clinical experience with anterior spinal fusion with pullout resistant nuts. Proceedings of World Spine IV, Istanbul, Turkey, July 2007, poster 162, pg 158.
77. **Lieberman IH**, Hardenbrook M, Wang J, Guyer R, Khanna J. Radiation exposure using miniature robotic guidance for spinal surgery. Proceedings of the 22<sup>nd</sup> NASS annual mtg, Austin Tx, Oct 2007. T Spine J, Sep/Oct, Vol 7, No 5S, pp 152S.
78. Jones A, Kayanja M, Milks R, **Lieberman IH**. Biomechanics of Posterior Hybrid Constructs Using Laminar Hooks and Pedicle Screws in Short Segment Thoracic Fixation. Proceedings of the 22<sup>nd</sup> NASS annual mtg, Austin Tx, Oct 2007. T Spine J, Sep/Oct, Vol 7, No 5S, pp 155S.
79. Mroz T, Klineberg, **Lieberman IH**. Radiation Exposure During Percutaneous Pedicle Screw Placement. Proceedings of the 22<sup>nd</sup> NASS annual mtg, Austin Tx, Oct 2007. T Spine J, Sep/Oct, Vol 7, No 5S, pp 62S.
80. Yamashita T, Siemionow K, Mroz T, **Lieberman IH**. A Prospective Analysis of Prognostic Factors in the Patients with Spinal Metastases- Use of the Revised Tokuhashi Score. Trans. of the 15<sup>th</sup> International Meeting on Advanced Spine Techniques, Hong Kong, 2008
81. Yamashita T, Siemionow K, Mroz T, **Lieberman IH**. Relation between health-related quality of life score and survival in the patients with spinal metastases -A prospective analysis. Trans. of the 15<sup>th</sup> International Meeting on Advanced Spine Techniques, Hong Kong, 2008
82. St Clair S, Tan JS, kayanja M, **Lieberman IH**. An evaluation of the kinematics and mode of failure of transpedicular lumbar interbody fixation. Trans. of the 15<sup>th</sup> International Meeting on Advanced Spine Techniques, Hong Kong, 2008
83. PodichettyV, Varley E, **Lieberman IH**. Role of Patient Based Health Staus Measurments in Opiod Management for Low Back Pain. Proc of NASS 23<sup>rd</sup> annual meeting, Spine Journal, 8 (2008) 1S-191S, pg 27
84. Mroz T, Yamashita T, **Lieberman IH**. The on and off label use of rhBMP-2 Infuse in Medicare and Non-Medicare Patients. Proc of NASS 23<sup>rd</sup> annual meeting, Spine Journal, 8 (2008) 1S-191S, pg 41
85. Yamashita T, Siemionow K, Mroz T, **Lieberman IH**. A prospective analysis of prognostic factors in patients with spinal metastases, use of the revised Tokuhashi score. Proc of NASS 23<sup>rd</sup> annual meeting, Spine Journal, 8 (2008) 1S-191S, pg 141

86. Lavelle W, Mroz T, **Lieberman IH**. Lumbar discectomy after selective nerve root blocks for patients with a lumbr disc herniation. Proc of NASS 23<sup>rd</sup> annual meeting, Spine Journal, 8 (2008) 1S-191S, pg 174
87. Yamashita T, Siemionow K, Mroz T, **Lieberman IH**. Relation between health-related quality of life score and survival in the patients with spinal metastases -A prospective analysis. Trans. of the 43<sup>rd</sup> annual meeting of the Scoliosis Research Society, pg 208, 2008
88. St. Clair S, Tan JS, Lieberman IH. Guided Oblique Lumbar Interbody Fixation: a biomechanical study in human cadaveric spines. Proc of SMISS 3<sup>rd</sup> annual meeting, pg 295, Las Vegas 2008
89. St. Clair S, Lieberman IH. Guided Oblique Lumbar Interbody Fixation: a feasibility study. Proc of SMISS 3<sup>rd</sup> annual meeting, pg 281, Las Vegas 2008
90. St. Clair S, **Lieberman IH**. Guided Oblique Lumbar Interbody Fixation: a surgical anatomic study. Proc of SAS 9<sup>th</sup> annual meeting, pg 132, London England, 2009
91. St. Clair S, Siemionow K, **Lieberman IH**. Static and dynamic biomechanical properties of GOLIF in vertebrectomy model. Proc of SAS 9<sup>th</sup> annual meeting, pg 154, London England, 2009
92. **Lieberman IH**, Benzel E, Linovitz R, Ross R. The results of a pilot study with a second generation total lumbar disc replacement. Proc of SAS 9<sup>th</sup> annual meeting, pg 188, London England, 2009
93. Benzel E, **Lieberman IH**, Linovitz R, Ross R, Zimmers K. The benefits of a viscoelastic total disc replacement. Proc of SAS 9<sup>th</sup> annual meeting, pg 189, London England, 2009
94. Ross R, **Lieberman IH**, Benzel E, Zimmers K, Kuras J. Stiffness – a key mechanical concept to understanding spinal function. Proc of SAS 9<sup>th</sup> annual meeting, pg 194, London England, 2009
95. St. Clair S, Tang Seng T, **Lieberman IH**. Guided Oblique Lumbar Interbody Fixation: a biomechanical study to compare against pedicle screws fixation. Proc of SAS 9<sup>th</sup> annual meeting, pg 210, London England, 2009
96. Siemionow K, **Lieberman IH**. The implications of intraoperative fluid replacement on pulmonary complications in patients undergoing spine surgery; a review of 1398 cases. Proc of IMAST 16<sup>th</sup> annual meeting, pg 147, Vienna, Austria, 2009
97. Mariscalo M, Yamashita T, Steinmetz M, Bell G, **Lieberman IH**, Mroz T. Radiation exposure to the surgeon during open lumbar microdiscectomy and minimally invasive microdiscectomy. Proc of IMAST 16<sup>th</sup> annual meeting, pg 150, Vienna, Austria, 2009
98. Yamashita T, Steinmetz M, **Lieberman IH**, Mroz T. The utility of repeated post operative radiographs following lumbar instrumented fusion? Proc of IMAST 16<sup>th</sup> annual meeting, pg 164, Vienna, Austria, 2009
99. Yamashita T, Siemionow K, Mroz T, Podichetty V, **Lieberman IH**. A Prospective Analysis of Prognostic Factors in Patients With Spinal Metastases - Use of The Revised Tokuhashi Score. Proc of IMAST 16<sup>th</sup> Annual Meeting, pg 132, Vienna, Austria, 2009
100. Yamashita T, Siemionow K, Mroz T, Podichetty V, **Lieberman IH**. Relation Between Health-Related Quality of Life Score And Survival in The Patients With Spinal Metastases - A Prospective Analysis. Proc of IMAST 16<sup>th</sup> Annual Meeting, pg 110, Vienna, Austria, 2009
101. St Clair S, Tan JS, **Lieberman IH**. Oblique lumbar interbody screw fixation (OLIF): a biomechanical study in human spines versus pedicle screw fixation. Eur Spine J (2009) 18 (Supp 4): S498

102. **Lieberman IH**, Benzel E, Ross R, Zimmer K. Pilot study with a viscoelastic lumbar total disc replacement. Proceeding AAOS 30th annual meeting. March 2010, Poster 384.
103. Siemionow K, **Lieberman IH**, et al. Intraoperative fluid management and pulmonary complications in patients undergoing spine surgery. Proceeding AAOS 30th annual meeting. March 2010, Paper 074.
104. **Lieberman IH**. Biomechanical and fatigue properties of percutaneous trans-pedicular fixation accompanied by facet screw fixation in the lumbar spine. Proceedings of the 2<sup>nd</sup> World Congress of Minimally Invasive Spine Surgery & Techniques, Las Vegas, USA, June 2010.

## **PRESENTATIONS**

### **Invited lectures Hospitals/Universities/National & International Meetings Etc.**

1. European Travelling Surgeons Visit, Harlow Wood Hospital, Nottingham, United Kingdom, Apr 1993. History of scoliosis surgery.
2. AO/ASIF Spine Course, Nottingham, United Kingdom, Jul 1993. Pedicle screws: indications and techniques.
3. AO/ASIF Operating Room Personal Course, Nottingham, United Kingdom, Jul 1993. Spinal anatomy and instrumentation.
4. Orthopaedic Nurses Association Meeting, Nottingham, United Kingdom, Sep 1993. Spine surgery: from Hippocrates to Queen's.
5. Ciurgia Da Coluna, Oporto, Portugal, Oct 1993. (1) Anterior odontoid screw fixation, (2) Management of metastatic spine disease.
6. AO/ASIF Spine Workshop, Oporto, Portugal, Oct 1993. Lecture and Workshop: Universal spine system for fractures, deformity and degenerative spine disease.
7. AO/ASIF Spine Course, Montreal, Quebec, Jul 1994. (1) Biomechanics of cervical spine fixation, (2) Biomechanics of thoraco-lumbar spine fixation for fractures.
8. Sports Medicine Symposium, Rhone Poulanc and Sports Medicine Specialists, Toronto, Ontario, Jul 1994. Back pain in the athlete.
9. AO/ASIF Spine Course, Davos, Switzerland, Dec 7, 1994. Table demonstrator: Spinal instrumentation.
10. AO/ASIF Course for Operating Room Personnel, Toronto, Ontario, Apr 9, 1995. The universal spinal system: Indications and techniques for use.
11. Canadian Orthopaedic Association, Instructional Course Lecture, Halifax, Nova Scotia, Jun 1995. Classification of thoracolumbar spine fractures.
12. Hotel-Dieu Grace Hospital Surgical Society, Windsor, Ontario, Sep 21, 1995. Endoscopic spinal surgery.
13. AO/ASIF Advanced Spinal Techniques Course, Southampton, Bermuda, Oct 6, 1995 - Oct 8, 1995. (1) Anterior odontoid screw fixation for dens fractures, (2) Surgical management of ankylosing spondylitis.
14. North York Branson Hospital's Clinical Day, Toronto, Ontario, Oct 25, 1995. Whats new in backs.
15. Deaconess Hospital, Eindhoven, Amsterdam, The Netherlands, Nov 24, 1995. Technique and preliminary results of endoscopic spinal fusion using the BAK interbody cage.
16. Smith & Nephew Richards, BAK Symposium, Atlanta, Georgia, Feb 23, 1996. Endoscopic BAK spinal fusion.
17. AO/ASIF Spine Course, Vancouver, British Columbia, Apr 11-14, 1996. (1) Principles of internal fixation, (2) Ankylosing spondylitis, (3) Biomechanical considerations of the lumbar spine, (4) Workshop: Universal spine system, (5) Scoliosis: Concepts, etiology and management.
18. Endo Ethicon Endoscopic Surgery Symposium, Hamburg, Germany, Jul 1996. 1) Endoscopic transthoracic spinal surgery, 2) Experience with BAK endoscopic spinal fusions.

19. Atlantic Provinces Orthopaedic Society, St. John, New Brunswick, Sep 1996. (1) Endoscopic transthoracic spinal surgery, (2) Experience with BAK endoscopic spinal fusions.
20. New Horizons in Spinal Surgery, Allegheny University, Philadelphia, Pennsylvania, Nov 1996. (1) Endoscopic transthoracic spinal surgery, (2) Cadaver lab practical session.
21. Trauma and Basic Spine Course, AO/ASIF International, Davos, Switzerland, Dec 1996. (1) Indications and techniques of pedicular systems in low back surgery, (2) Fusion with and without rigid fixation, (3) Minimal invasive spinal surgery overview, (4) Fireside discussion: Non-traumatic spine.
22. Minimal Invasive Spine Surgery Symposium, AO/ASIF International, Davos, Switzerland, Dec 1996. Transperitoneal ALIF with gas: Results and complications.
23. AO/ASIF Advanced Spinal Techniques Course, Banff, Alberta, Mar 1997. 1) Metastatic Epidural Compression, 2) Anterior Lumbar Interbody Fusion; Laparoscopic or Open Techniques, 3) Session Moderator-Degenerative Lumbar Disc Disease, 4) Session Moderator Fireside Discussion.
24. Instituto Ortopedico Rizzoli, Bologna, Italy, Apr 1997. 1) Treatment Options for Degenerative Disc disease; The Role for Interbody Fusion 2) The Role of Endoscopy in Spinal Deformity Correction.
25. Canadian Orthopaedic Nurses Association Conference, Toronto, Ontario, Apr 20, 1997. Scoping Out the Spine.
26. Canadian Orthopaedic Association, Instructional Course Lecture, Hamilton, Ontario, Jun 3, 1997. New and Innovative Spinal Surgical Techniques.
27. Spinetech Workshop, BAK Laparoscopic training, Ethicon Endo Surgery Institute, New Jersey, Oct 26 1997.
28. AAOS, Practical Strategies in Spine Surgery: Current Applications & Techniques, Orthopaedic Learning Centre, Rosemont Illinois, Nov 7-9 1997, 1) BAK technique, live video demonstration 2) Indications and Techniques for Thoracoscopic Surgery.
29. Trauma and Basic Spine Course, AO/ASIF International, Davos, Switzerland, Dec 1997. (1) Late surgery affects neurological outcome (2) Failed construction, why and what now? (3) Surgical challenges rheumatoid arthritis (4) Surgical complications rheumatoid arthritis (5) Fireside discussion: Non-traumatic spine. (6) Fireside discussion: Deformity (7) Surgical concepts and complications in congenital scoliosis (8) Multiply-operated lower back contra-indication for surgery
30. Minimal Invasive Spine Surgery Symposium, AO/ASIF International, Davos, Switzerland, Dec 1997. Stand alone anterior cages technique.
31. UMASS Endoscopic Spine Workshop, Worcester Mass. Mar 1998. Endoscopic Lumbar Spine Fusions.
32. AAOS, Debating Complex Issues in Spine Surgery. Chicago, Illinois, Apr. 1998. 1) Thoracoscopic technique for DDD, video demonstration 2) Laparoscopic technique; Limitations of Anatomy, Equipment and Complications 3) Panel Discussions
33. Simposio International De Orthopaedia Traumatologia. Lisbon Portugal, May 1998. 1) Anterior approaches in lumbar instabilities 2) Anterior approaches in revision surgery 3) Indications for thoracoscopy in spinal surgery
34. UMASS Endoscopic Spine Workshop, Worcester Mass. Jun. 1998. 1) Endoscopic Lumbar Spine Fusions.

35. Akron General Hospital, Department of Orthopaedic Surgery. Akron Ohio, August 1998. 1)Role of anterior lumbar fusions in symptomatic degenerative disc disease 2)Treatment of ankylosing spondylitis of the spine.
36. AO/ASIF Spine Course for Operating Room Personnel. Savannah Georgia, October 1998. 1)Surgical approaches to the spine 2)Operative management of spinal deformity.
37. AAOS, Practical Strategies in Spine Surgery: Current Applications & Techniques, Orthopaedic Learning Center, Rosemont Illinois, November 1998. 1)Indications biomechanics and complications of lumbar interbody fusion cages 2) Indications and Techniques for Thoracoscopic Surgery.
38. Synthes Spine National Meeting. Ponte Verda Beach Florida. November 1998. 1)The pathology and treatment options for scoliosis 2)Anterior scoliosis surgery.
39. GICD-USA, The Management of Vertebral Intercorporeal Disorders. Chicago Illinois, December 1998. Thoracoscopic spine surgery, indications and results.
40. University of South Florida, Ski with the Spine Center. Whistler B.C. January 1999. 1)Cervical spine iatrogenic instability, literature review and surgical options 2)USS deformity workshop.
41. AAOS, Contemporary Issues in Spine Surgery. Sarasota Florida, March 1999. 1) Can Cages Cure Stenosis 2) Fusion with cages; Limitations of Anatomy, Equipment and Complications 3)Video surgical demonstration 4)Panel Discussions.
42. AO/ASIF Comprehensive Spine Course. Cancun Mexico, April 1999. 1)Thoracolumbar trauma implant insertion techniques and pitfalls 2)Laparoscopy for spine surgery.
43. Sulzer Spine-Tech National Meeting. Tucson Arizona, April 1999. Laparoscopic lumbar fusions.
44. Sulzer Spine-Tech Advanced Education Course. Annapolis Maryland, May 1999. 1)Laparoscopic lumbar fusions 2)Complex case discussions.
45. UMASS Endoscopic Spine Workshop, Worcester Mass. May 1999. Endoscopic Lumbar Spine Fusions.
46. AAOS, Practical Strategies in Spine Surgery: Current Applications & Techniques, Orthopaedic Learning Center, Rosemont Illinois, August 1999. 1)Indications biomechanics and complications of lumbar interbody fusion cages 2) Indications and Techniques for Thoracoscopic Surgery
47. Meridia South Pointe Hospital, Orthopaedic RPAC. August 1999. State of the Art Minimally Invasive Spinal Surgery.
48. Quebec Orthopaedic Association, Annual Symposium. MontSainte-Anne, Quebec. September 1999. 1)Laparoscopic Surgery in the Lumbar Spine 2)The Future Role of Mini Invasive Surgery of the Spine.
49. UMASS Endoscopic Spine Workshop, Worcester Mass. October 1999. Endoscopic Lumbar Spine Fusions.
50. Research Institute International, Anterior Column Support Course. Paradise Island, Bahamas. November 1999. 1)Spinal Imaging 2)Treatment Principles and Results for Spinal Metastases 3) Treatment Options in Spinal Stenosis 4)Translaminar Screws.
51. Cleveland State University. PT & OT student lectures. December 1999. Spinal Trauma & Injury.
52. University of South Florida, Ski with the Spine Center. Whistler B.C. January 2000. 1)Video assisted deformity surgery 2)USS deformity workshop.

53. AAOS, Minimally Invasive Spine Surgery: Academy Skills Course, PAWS Facility, St Louis Missouri, July 2000. 1)Kyphoplasty for vertebral compression fractures, lecture & surgical demonstration 2) Kyphoplasty Indications and Results.
54. NASS, Spine Across the Sea 2000. Waikoloa Hawaii, July 2000, 1)moderator: "Imaging & Diagnostics" session.
55. NASS, Annual Meeting. New Orleans Louisiana, October 2000, 1)moderator: "cage & fusion" session 2)moderator: "endoscopic surgery" session 3)Revision Strategies for failed interbody fusion cages, presented during "cage symposium" 4)SIG discussion leader: cage usage.
56. AAOS, Contemporary Issues in Advanced Spinal Surgery: Current Applications & Techniques, Orthopaedic Learning Center, Rosemont Illinois, November 2000. 1)Anterior Interbody Fusions, Indications biomechanics and complications 2) Anterior Thoracoscopic Discectomy & Release for Spinal Deformity.
57. University of South Florida, Ski with the Spine Center. Whistler B.C. January 2001. 1)Kyphoplasty for the treatment of Vertebral compression fractures 2)USS deformity workshop.
58. Denver Spine Institute Annual Meeting. Breckenridge Colorado. February 2001. 1)Kyphoplasty for the treatment of Vertebral compression fractures 2)Revision Strategies for Failed Interbody Cages.
59. AAOS, Annual Meeting. San Francisco California, February 2001, 1)Minimally Invasive Spinal Surgery,,, has it changed outcome? presented at "Emerging Technology Symposium" 2)Failed Surgery for axial pain and failed interbody surgery, presented at instructional course lecture "Management of Failed Back Surgery Syndrome".
60. Federation of Spine Associations (FOSA) Specialty Day. San Francisco California, February 2001, 1) Revision Strategies for failed interbody fusion cages, presented during "cage symposium"
61. Pittsburgh Rheumatology Associaton Dinner. Pittsburgh Pennsylvania. April 2001. 1) Kyphoplasty for the treatment of Vertebral compression fractures.
62. Hellenic Association of Orthopaedic Surgery & Traumatology, Spine Section 27<sup>th</sup> Annual Meeting. Athens Greece. April 2001. 1) Kyphoplasty for the treatment of Vertebral compression fractures 2)Laparoscopic Lumbar Fusion Cages, Techniques & Pitfalls 3)Transthoracic Endoscopic Deformity Surgery
63. Innovations, Challenges and Controversies in Spine Surgery. Jackson Wyoming. July 2001. 1)Cage complications and revision strategies 2)Osteoporotic vertebral fractures-treatment.
64. NASS, Annual Meeting. Seattle Washington, October 2001, 1)moderator: "cage & fusion" session 2)moderator: "endoscopic surgery" session 3)technique & results of kyphoplasty
65. Brussels International Spine Symposium, Vertebral osteoporotic Compression Fractures. Brussels Belgium. Nov 2001. 1)Kyphoplasty 2)Risks and complications of vertebroplasty
66. AANS/CNS Section on disorders of the Spine and peripheral nerves, 18<sup>th</sup> annual meeting. Orlando Florida. Feb 2002. 1) Kyphoplasty technique update.
67. Federation of Spine Associations (FOSA) Specialty Day. Dallas Texas. March 2002 1) Kyphoplasty technique update, NASS section 2) Indications and results of Kyphoplasty, SRS section.
68. Musculoskeletal Tumor Society Specialty Day. Dallas Texas. March 2002. 1) Metastatic Disease of the Spine and Vertebral Augmentation.

69. Cleveland Orthopaedic Society. Symposium-Vertebral Osteoporosis, A collaborative medical and surgical approach. Cleveland Ohio. March 2002. 1) Kyphoplasty in the treatment of Osteoporotic and Osteolytic compression fractures.
70. Osteobiologics Science Update. Depuy Osteobiologics. Vail Colorado. March 2002. 1) Osteoprogenitor cells for anterior lumbar interbody fusions, case presentations.
71. Cedar Sinai Medical Center. Current Concepts in Spinal Disorders. Palm Springs California. March 2002. 1) Prone position endoscopy for spinal deformity 2) Kyphoplasty and Vertebroplasty.
72. AAOS, Minimally Invasive Spine Surgery: Academy Skills Course, PAWS Facility, St Louis Missouri, Course Chairman, April 2002. 1) Kyphoplasty for vertebral compression fractures, lecture & surgical demonstration 2) Kyphoplasty Indications and Results.
73. SICOT Annual Meeting: San Diego California, August 2002. 1) Kyphoplasty in the treatment of Multiple Myeloma 2) Kyphoplasty for osteoporotic or osteolytic vertebral compression fractures.
74. AAOS, New Perspectives On The Aging Spine: Course Chairman, Chicago IL., October 2002. 1) Neurodiagnostic Studies: Why, When, How & When to Order? 2) Surgical Treatment of Degenerative Spondyloarthrosis/ Scoliosis 3) Lumbar Spine Case Presentation 4) Epidemiology and Clinical Consequences of Osteoporotic Vertebral Compression Fractures.
75. Association of Bone and Joint Surgeons Workshop on Metastatic Bone Disease, Tampa Florida, November 2002. 1) Vertebral Augmentation for Osteolytic Tumors.
76. Brigham & Women's Hospital/Massachusetts General Hospital Visiting Professor, Boston Massachusetts, November 2002. 1) State of the Art in Minimally Invasive Spinal Surgery 2) Case Presentations with residents.
77. 3rd World Congress of Minimally Invasive Spinal Surgery & Surgery, Phoenix Arizona, Dec 2002. 1) Vertebral Augmentation for Osteoporotic compression fractures.
78. University of South Florida, Ski with the Spine Center. Whistler B.C. January 2003. 1) Spinal Implant Pricing, what we need to know 2) Economics of kyphoplasty 3) MTF Allograft workshop.
79. Orthopaedic Research Society, 49<sup>th</sup> Annual Meeting. New Orleans, February 2003. Symposium; Musculoskeletal Stem Cells: Basic Science to Clinical Practice. 1) Clinical Use of Bone Marrow Derived Osteoprogenitor Cells in Orthopaedic Surgery.
80. Cedars-Sinai Medical Center, Current Concepts in Spinal Disorders, Feb 2003, La Quinta. 1) Three dimensional spinal alignment. 2) Progress in VCF treatment; Kyphoplasty.
81. Denver Spine Institute Winter Conference, March 2003, Breckenridge. 1) Remote & Adjacent level fractures after vertebral augmentation.
82. Spine Education Summit, Exploring current concepts in spine surgery, March 2003, Vail. 1) Bone Marrow Aspirate and Osteoprogenitor Cell Concentration to Augment Interbody Fusion. 2) Revision Strategies for Interbody Fusion Cages. 3) Radiation Safety and Radiographic anatomy of the Spine. 4) OrthoBiologics Forum & panel discussion.
83. AAOS, Minimally Invasive Spine Surgery: Academy Skills Course, PAWS Facility, St Louis Missouri, Course Chairman, April 2003. 1) Translaminar screw fixation of the lumbar spine, lecture & surgical demonstration 2) Kyphoplasty Indications and Results.

84. Controversies in Lumbar Spine Surgery, April 2003, Las Vegas. 1) Femoral Ring Allograft for ALIF 2) Percutaneous Access to the Lumbar and Thoracic Spine 3) Autologous Generated Fusion Enhancement 4) Translaminar screw fixation lab 5) Mini-ALIF lab.
85. Spine 2003, Pacific Spine Institute at Fountain Valley Hospital, April 2003, Newport CA. 1) Vertebral Augmentation for Osteoporotic & Osteolytic Fractures 2) Translaminar Screw Fixation 3) Cage Revision Strategies 4) Combined Endo-trans-thoracic Release and Posterior Instrumentation for Spinal Deformity.
86. IX International Workshop on Multiple Myeloma, Salamanca, Spain, May 2003. 1) Minimally invasive surgical management of spinal lesions.
87. University of Arkansas Cancer Research Center Grand Rounds, Little Rock Arkansas, June 2003. 1) Surgical treatment of the musculoskeletal manifestations of Multiple Myeloma.
88. IMAST 10<sup>th</sup> Annual Meeting, Rome Italy, July 2003. 1) Roundtable discussion, "Spondylolisthesis" 2) Instructional course Lecture, "Emerging Technology in Osteobiologics" 3) Instructional course Lecture, "Spinal-Pelvic Fixation Techniques".
89. AAOS, New Perspectives On The Aging Spine: Course Chairman, Washington DC., October 2003. 1) Epidural steroid injections, what, why & how? 2) Surgical Treatment of Degenerative Spondylolisthesis/ Scoliosis 3) Lumbar Spine Case Presentation 4) Epidemiology and Clinical Consequences of Osteoporotic Vertebral Compression Fractures.
90. North American Spine Society Annual Meeting, San Diego CA, Oct 2003. 1) Minimally Invasive Treatment of Vertebral Compression fractures 2) Adult Kyphosis 3) Bone Grafting Options 4) Cost Issues for Spine Surgery 5) Special Interest Group, Translaminar Screw Fixation 6) Session Moderator, Vertebral Augmentation.
91. Cleveland Clinic Foundation & Ege University, Aegean Spine Review, A comprehensive approach for neurosurgeons and orthopaedic surgeons. Izmir Turkey, Nov 2003. Course Co-Chairman. 1) Minimally Invasive Spine Surgery, State of the Art 2) Dorsal Cervical Fixation 3) Kyphoplasty and Vertebroplasty 4) Bone Graft Options 5) Biomechanics of Spinal Deformity 6) Dorsal and Dorsolateral Exposure of the spine 7) Kyphoplasty hands on workshop 8) Cadaver lab instructor.
92. University of South Florida, Ski with the Spine Center. Whistler B.C. January 2004. 1) Fraud & Abuse what we need to know 2) kyphoplasty workshop.
93. Spine Education Summit, Exploring current concepts in spine surgery, February 2004, Vail. 1) Selective Cell Retention for Lumbar Interbody Fusions 2) The Painful Lumbar Disc Forum & panel discussion.
94. American Society of Spine Radiology, Annual Symposium. Miami Florida, February 2004. 1) Kyphoplasty in the treatment of osteoporotic and osteolytic compression fractures.
95. Musculoskeletal Tumor Society Specialty Day. San Francisco. March 2004. 1) Kyphoplasty for Osteolytic vertebral collapse.
96. American College of Surgeons, Chilean Chapter Annual Meeting, Santiago, Chile. May 2004. 1) Advances in Spinal Immobilization Techniques 2) Vertebroplasty and Kyphoplasty 3) Spinal Cord and Column Trauma; Avoiding Further Injury.
97. Cayman Islands Medical Society, CME lecture, Georgetown, Grand Cayman. May 2004. 1) State of the Art in Minimally Invasive Spinal surgery.
98. Spine Week 2004, Symposium; Current concepts in biologic graft enhancements and interbody fusions. June 2004. 1) Selective Stem Cell Retention to Augment Allograft Bone; technique and results.

99. CancerCare Education Teleconference; Caring for your bones during breast cancer treatment. June 2004
100. IMAST 11<sup>th</sup> Annual Meeting, Bermuda, July 2004. 1) Instructional course Lecture, “Percutaneous Pre-Sacral Access for L5-S1 Arthrodesis” 2) Instructional course Lecture, “Use of marrow based technologies for bone regeneration”. 3) Moderator, session X: Basic Science.
101. Innovative Techniques in Spine Surgery, Los Cabos, Mexico, August 2004.  
1) Bone Marrow & Stem Cells for Lumbar Fusions 2) Minimally Invasive Access for Spine Surgery
102. AAOS, New Perspectives On The Aging Spine: **Course Chairman**, San Diego, October 2004. 1) Surgical Treatment of Degenerative Spondyloarthrosis/ Scoliosis 2) New mechanical technologies and their implications for the aging spine 3) Biomechanics of the Osteoporotic Spine 4) Evidenced based comparison of Vertebroplasty and Kyphoplasty.
103. North American Spine Society Annual Meeting, Chicago, Oct 2004. 1) Minimally Invasive Surgery the Technology Conundrum 2) Cost Issues for Spinal Surgery 3) Off label use of medical devices 4) Bone Marrow Aspiration for Spinal Fusion 5) **Symposium Chairman**, “A Rational Approach to Emerging Spinal technologies” 6) Session Moderator, Vertebral Augmentation.
104. American Association of Neurological Surgeons Minimally Invasive Spinal Techniques course, Memphis, Dec 2004. 1) Indications and technique for Kyphoplasty 2) Lab demonstrator, MIS techniques
105. University of South Florida, Ski with the Spine Center. Whistler B.C. January 2005. 1) The truth about discography 2) kyphoplasty workshop.
106. Arab Health Congress 2005. Dubai UAE. Feb 2005. **Symposium Chairman** “Mid East Orthopaedics Symposium”, **Symposium Chairman** “Advances in Laparoscopic Surgery”, 1) Disc Arthroplasty; What, Why & How? 2) Laparoscopic Lumbar Fusions.
107. The Winter Clinics for Cranial and Spinal Surgery. Snowmass, Colorado. March 2005. 1) Indications and Results for Kyphoplasty 2) Disc Arthroplasty; who will pay for it?
108. NASS/AAOS Fundamental and Advanced Techniques in Spine Surgery; A hands on course. Practical Anatomy Workshop, St Louis, MO. April 2005. 1) Translaminar screw fixation 2) Indications and results of Kyphoplasty
109. William Beaumont Hospital Visiting Professor; Department of Orthopaedics. Detroit, Michigan. April 2005. 1) Disc Arthroplasty; What, Why & How? 2) Resident Case Reviews
110. Cleveland Spine Symposium, Scoliosis Association; Cleveland, Ohio. June 2005. **Course Chairman**. 1) Selective stem cell retention for spinal fusion
111. Emerging Technologies in Spine Surgery, Abbott Spine; Las Vegas, Nevada. June 2005. 1) Basic and clinical science of bone marrow aspirates 2) The economics of disc arthroplasty
112. IMAST 12<sup>th</sup> Annual Meeting, Banff, Alberta, July 2005. 1) Instructional course Lecture, “Percutaneous Pre-Sacral Access for L5-S1 Arthrodesis” 2) Instructional course Lecture, “Use of Stryker Luxor MIS spine system”. 3) Moderator, session V: Lumbar Degenerative
113. Innovative Techniques in Spine Surgery, Los Cabos, Mexico, July 2005.  
1) Economics of disc replacement; is it workable 2) Minimally Invasive Access for Spine Surgery; how I do it 3) Moderator, panel debate MISS
114. World Spine III, Rio de Janeiro, Brazil, August 2005. 1) chairman & speaker for pre-course symposium; “the Spectrum of vertebral augmentation” 2) Debate: axial back pain; “the case for fusion”

115. World Research Group Healthcare Management Series; Building Spine Centers of Excellence, Las Vegas, Nevada, Sept 2005. 1) Managing rising supply and implant costs in your center of excellence
116. Macnab Orthopaedic Society Annual Meeting; Sedona, Arizona, Sept 2005. 1) Selective cell retention for lumbar fusions 2) A new paracoccygeal percutaneous approach to L5/S1 lumbar fusions
117. North American Spine Society Annual Meeting, Philadelphia, Sept 2005.  
1) Minimally Invasive Surgery the Technology Conundrum 2) Cost Issues for Spinal Surgery 3) Bone graft substitutes, biomechanics 4) Moderator, Disc Arthroplasty II session
118. Cleveland Clinic Foundation & Ege University, Aegean Spine Review, A comprehensive approach for neurosurgeons and orthopaedic surgeons. Izmir Turkey, Nov 2005. Course Co-Chairman. 1) Minimally Invasive Spine Surgery, State of the Art 2) Dorsal Cervical Fixation 3) Kyphoplasty and Vertebroplasty 4) Bone Graft Options 5) Biomechanics of Motion Implants 6) Cadaver lab instructor.
119. Dutch Spine Society, 1<sup>st</sup> Lustrum Congress. Spinal Metastasis. Utrecht, Netherlands. Nov 2005. 1) Minimally Invasive Techniques to treat Spinal Metastasis.
120. Oncology World Congress, New York, NY. Nov 2005. 1) Kyphoplasty and Vertebroplasty for the management of spinal compression fractures.
121. University of South Florida, Ski with the Spine Center. Whistler B.C. January 2006. 1) The Economics of Spine Surgery 2) Vertebral Augmentation 3) Kyphoplasty workshop.
122. Middle East Spine Surgery Symposium. Dubai, UAE. January 2006.  
1) problem solving in cervical spine surgery 2) Vertebral Augmentation; Kyphoplasty and Vertebroplasty 3) Current Concepts in Spinal Surgery.
123. The Winter Clinics for Cranial and Spinal Surgery. Snowmass, Colorado. March 2006. 1) Selective stem cell retention for lumbar fusions 2) Spine economics.
124. AANS/CNS 22<sup>nd</sup> Annual Meeting of the Joint Section on Disorders of the Spine. Lake Buena Vista, Florida. March 2006. 1) Special Course Interventional Spine Surgery; Vertebral Augmentation 2) Scientific Session III Vertebral Augmentation.
125. NAON, National Assoc of Orthopaedic Nurses, Nursing and Allied Health Program. Chicago, IL. March 2006. 1) Osteoporosis of the Spine
126. AANS 2006 Annual Meeting. San Francisco, CA. April 2006. 1) Transfacet technology; an alternative to pedicle screw fixation
127. VI International Bakirkoy Days, Bakirkoy Hospital for Neurological Diseases. Istanbul, Turkey. May 2006.  
1) Vertebral Augmentation 2) Ortho Neuro collaboration in a spine center 3) Less Invasive Spinal Fusions
128. Biomed Israel 2006, 5<sup>th</sup> National Life Sciences & Technology Week. Jerusalem Israel. May 2006. 1) the Good the Bad and the Ugly, Spine Surgery 2006 and Beyond.
129. IMAST 13<sup>th</sup> Annual Meeting, Athens, Greece, July 2006. 1) Instructional course Lecture, "Percutaneous Pre-Sacral Access for L5-S1 Arthrodesis" 2) Round Table discussion, "Minimally Invasive Surgical Solutions"
130. Clinical Controversies in Multiple Myeloma, Cleveland, Sept 2006. 1) supportive bone care for patients 2) Surgical management of osteolytic lesions of the skeleton

131. North American Spine Society Annual Meeting, Seattle, Wa, Sept 2006.  
1) Epidemiology and appropriate work-up of back pain in children and adolescents 2) Surgical considerations for lumbar degenerative conditions 3) Moderator, Concurrent session 2; vertebral augmentation, tumors and infection
132. National Congress of the Italian Orthopaedic and Trauma Society, Rome, Italy, Nov 2006. 1) Management of vertebral and sacral insufficiency fractures with cement augmentation techniques 2) Workshop on Kyphoplasty
133. 13<sup>th</sup> Brussels International Spine Symposium, fractures of the spine and tumors in the spine , Brussels, Belgium, Nov 2006. 1) Kyphoplasty and Vertebroplasty for spinal tumors 2) radiosurgery for spinal tumors 3) session moderator “surgery for spinal tumors”
134. AANS 2007 Annual Meeting. Washington DC. April 2007. 1) Transfacet technology; an alternative to pedicle screw fixation
135. The 36th Annual Meeting of the Japanese Society for Spine Surgery and Related Research. Kanazawa, Japan. April 2007. 1) Vertebral Augmentation for osteoporotic and osteolytic lesions
136. 2<sup>nd</sup> Annual Central Virginia Spine Symposium. Richmond, VA. June 2007. 1) Vertebral Augmentation for osteoporotic and osteolytic lesions
137. Innovative Techniques in Spine Surgery, Los Cabos, Mexico, June 2007.  
1) Freedom Lumbar Disc Design 2) Image guided and Robotic Surgery 3) Economics of motion preservation – Not Workable
138. Less Invasive Lumbar Fusion. Soroka University Medical Center & Meir Hospital, Israel. July 2007.  
1) Less invasive fusion surgery technique using paracoccygeal access and transacral fixation 2) live surgical demonstration, 4 cases at 2 hospitals
139. World Spine IV, Interdisciplinary Congress on Spine Care. Istanbul, Turkey, July 2007. 1) Pre-course symposium; treatment of the painful lumbar disc – endoscopic far lateral decompression 2) paper presentation session moderator; Vertebroplasty and Kyphoplasty 3) Special Interest group session moderator; vertebroplasty and Kyphoplasty
140. Egypt Spine 2007. Cairo, Egypt, August 2007. Spine review and hands on course. 1) image guided and robotic spine surgery 2) biomechanics of motion preservation 3) pedicle, translaminal and facet screw fixation 4) minimally invasive spine surgery 5) lab demonstrator
141. North American Spine Society Annual Meeting, Austin, Tx, Oct 2007.  
1) Interbody Fusion Technologies Technique Workshop, paracoccygeal transacral L5S1 access and fixation 2) Minimally Invasive Surgery Symposium: Is It Worth the Switch? Impact on the Surgeon, medicolegal & radiation 3) Moderator, SIPP 2: Kyphoplasty / Deformity
142. AAOS, Contemporary Techniques in Spinal Surgery: Orthopaedic Learning Center, Rosemont Illinois, November 2007. 1)Anterior Lumbar Interbody Fusions, Indications, results and complications 2) Rational use of BMPs in the lumbar spine 3) lab demonstrator
143. AAOS, Board Maintenance of Certification Preparation and Review: Cambridge, MA, December 2007. 1) Adult Spine Trauma 2) Cervical & Thoracic Disc Degeneration
144. Orthopaedic Institute at Mercy Hospital; Miami Florida, Mar 2008. 1) Contemporary concepts in the treatment of metastatic spine disease
145. AANS 2008 Annual Meeting. Chicago, IL. April 2008. 1) Transfacet technology; an alternative to pedicle screw fixation

146. Delray Medical Center CME Lecture, Delray FL, June 2008. 1) Contemporary treatment options for spinal metastases
147. 81<sup>st</sup> Annual Congress of the Japanese Orthopaedic Association. Sapporo, Japan, May 2008. 1)Clark Luncheon Lecture – Current Status of Minimally Invasive Surgery in the United States 2) Clinical results of vertebroplasty and kyphoplasty with PMMA for osteoporotic and osteolytic compression fractures
148. Innovative Techniques in Spine Surgery, Los Cabos, Mexico, June 2008.  
1) Freedom Lumbar Disc, Update 2)Robotic Guidance, Enabling new Surgical Approaches 3) Moderator Minimally Invasive Spine Surgery Round Table
149. Keshin CME Lecture, North Shore Medical Center, Miami FL, Sept 2008. 1) Contemporary treatment options for spinal metastases
150. World Research Group Healthcare Management Series; Building Spine Centers of Excellence, Las Vegas, Nevada, Sept 2007. 1) Cultural alignment: improving synergies between the clinical disciplines in a spine center
151. Scoliosis Research Society 43rd annual meeting, Salt Lake City, September 2008. 1) Integrating clinical care and teaching in Uganda
152. NASS 23rd annual meeting, Toronto, Canada, October 2008. 1) pre-course symposium, section on spine biologics and research, Anterior Lumbar Interbody Fusions, options, role of biologics, decision making
153. Society for Minimally Invasive Spine Surgery annual meeting, Las Vegas, Nov 2008. 1) The future; image guidance, navigation , robotics and radiosurgery for spinal pathology.
154. AAOS, Board Maintenance of Certification Preparation and Review: Boston, MA, December 2008.  
1) Adult Spine Trauma 2) Cervical & Thoracic Disc Degeneration 3) Lumbar Degen and Spondylolisthesis
155. AAOS, Annual Meeting. Las Vegas, Nevada, February 2009, 1) ALIF, when are orthobiologics indicated? presented at “Bone Defects, Orthobiologics Symposium”
156. 10<sup>th</sup> Israeli Spine Society Meeting, Eilat, Israel, April 2009, 1) Guided Oblique Lumbar Interbody Fixation workshop 2) Axialif workshop 3) Moderator, dynamic stabilization session 4) Use of Robotics and navigation in spine surgery 5) Biomechanics of motion preservation 6) Update on treatment of osteolytic fractures 7) Guided Oblique Lumbar Interbody Fixation; safety, feasibility and biomechanical properties
157. SAS 9<sup>th</sup> annual meeting, London, England, April 2009, 1) Master techniques in MISS, panel discussion 2) Lateral Approaches, session moderator
158. IMAST 16<sup>th</sup> Annual Meeting, Vienna, Austria, July 2009. 1) Instructional course Lecture, “Treatment of vertebral compression fractures” , chairman 2) Instructional course Lecture, “Vertebral Augmentation for osteolytic vertebral fractures” 3) Instructional course Lecture, “Non-Fusion options for adult scoliosis” 4) Concurrent session 6B, session moderator
159. Society for Minimally Invasive Spine Surgery annual meeting, Las Vegas, October 2009. 1) Robotics in spine surgery 2) Panel Discussion Moderator; infections
160. AAOS, Board Maintenance of Certification Preparation and Review: Boston, MA, November 2009. Course Co-Chairman. 1) Adult Spine Trauma 2) Lumbar Degen and Spondylolisthesis
161. 12<sup>th</sup> World Congress of Endoscopic Surgery, SAGES Annual Meeting, Washington DC, April 2010. Symposium; MBA for Surgeons. 1) The Leadership Moment

162. SAS 10<sup>th</sup> annual meeting, New Orleans, USA, April 2010, 1) Where does MIS fit into my practice; Complication avoidance 2) Where does MIS fit into my practice; panel discussion 3) Challenges in Lumbosacral fixation
163. 2<sup>nd</sup> World Congress of Minimally Invasive Spine Surgery & Techniques, Las Vegas, USA, June 2010, 1) Avoidance of Complications in MISS 2) Robotic Spine Surgery
164. Innovative Techniques in Spine Surgery, Los Cabos, Mexico, June 2010. 1) Interspinous devices does anyone believe? 2) MIS complication avoidance
165. IMAST 17<sup>th</sup> Annual Meeting, Toronto, Canada, July 2010. 1) Instructional course Lecture, “Vertebral Augmentation for osteolytic vertebral fractures” 2) Instructional course Lecture, “Non-Fusion options for adult scoliosis” 3) Round Table Panel, “lumbar degenerative disease” 4) Chair ICL 4D, ICL 5D 5) Demonstrator “hands on workshop, spondylolisthesis, axial fixation”
166. Macnab Orthopaedic Society Annual Meeting; Toronto, Canada, Sept 2010. 1) Clinical Outcome with a Viscoelastic Disc Replacement 2) Robotics and Navigation for Spinal Surgery
167. Breakthroughs in Spine Surgery, Harborview Medical center, Seattle, Washington, October 2010. 1) Comparison of Vertebral Augmentation Procedures 2) Vertebroplasty or Kyphoplasty?

### Peer Reviewed Papers Read at Scientific Meetings

1. **Lieberman IH**, Bogoch ER, Grynbas MD: Morphology and mineralization of bone in the femoral heads. Canadian Orthopaedic Association, Ottawa, Ontario, Jun 1988.
2. **Lieberman IH**, Hastings D, Bogoch ER: Heterotopic ossification after primary cemented and cementless total hip arthroplasty involving patients with rheumatoid arthritis and osteoarthritis. American Orthopaedics Residents Association, Ann Arbor, Michigan, Apr 1992.
3. **Lieberman IH**, Hastings D, Bogoch ER: Heterotopic ossification after primary cemented and cementless total hip arthroplasty involving patients with rheumatoid arthritis and osteoarthritis. Canadian Orthopaedics Residents Association, Montreal, Quebec, May 1992.
4. **Lieberman IH**, Beaton D, Richards RR: Functional outcome following posterior shoulder repair. Harlow Wood Hospital, Malkin Day Lectures, Division of Orthopaedics, Nottingham, United Kingdom, Apr 1993.
5. **Lieberman IH**, Webb JK: Occipito-cervical fusion using posterior titanium plates. British Cervical Spine Society, Glasgow, Scotland, Sep 1993.
6. **Lieberman IH**, Beaton D, Richards RR: Functional outcome following posterior shoulder repair. American Academy of Orthopaedic Surgeons, New Orleans, Louisiana, Feb 1994.
7. **Lieberman IH**, Webb JK: Cervical spine injuries in the elderly. American Academy of Orthopaedic Surgeons, Orlando, Florida, Feb 1995.
8. **Lieberman IH**, Salo P, Litwin D: Endoscopic anterior lumbar fusion for degenerative disc disease: Technique and preliminary results. Canadian Orthopaedic Association, Halifax, Nova Scotia, Jun 1995.
9. **Lieberman IH**, Webb JK: Occipito-cervical fusion using titanium plates: Indications techniques and examples. Canadian Orthopaedic Association, Halifax, Nova Scotia, Jun 1995.
10. **Lieberman IH**, Salo PT, Deber R, Kraetschmer N: Shared decision-making in patients with back pain. Canadian Orthopaedic Association, Halifax, Nova Scotia, Jun 1995.
11. **Asante DK**, Lieberman IH, Salo PT, Kraetschmer BG: A prospective study to determine the outcome of surgery in the treatment of spinal stenosis using the Oswestry Disability Index and the SF-36 Health Survey. Canadian Orthopaedic Association, Quebec City, Quebec, May 1996.
12. **Lieberman IH**, Litwin DE, Salo PT, Kraetschmer BG: Anterior interbody fusion using the BAK device: Pitfalls and complications. Canadian Orthopaedic Association, Quebec City, Quebec, May 1996.
13. **Lieberman IH**, Woodside T: Anterior vertebral body screw testing: Comparison of Zielke, Kaneda, USS, and USS with pull out resistant washer. Canadian Orthopaedic Research Society, Quebec City, Quebec, May 1996.
14. **Lieberman IH**, Salo PT: Endoscopic transthoracic release and bone grafting with simultaneous posterior instrumentation and correction for spinal deformity. Canadian Orthopaedic Association, Quebec City, Quebec, May 1996.
15. **Lieberman IH**, Asante D, Kraetschmer BG: A prospective outcome study using the Oswestry disability index and the SF-36 Health survey in the treatment of spinal stenosis. North American Spine Society, Vancouver, British Columbia, Oct 25, 1996.

16. **Lieberman IH, Salo PT, Kraetschmer BG:** Simultaneous endoscopic transthoracic release and posterior instrumentation for spinal deformity. North American Spine Society, Vancouver, British Columbia, Oct 25, 1996.
17. **Lieberman IH, Woodside T:** Anterior vertebral screw pull out testing: Comparison with a pull out resistant nut. North American Spine Society, Vancouver, British Columbia, Oct 26, 1996.
18. **Lieberman IH, Salo PT, Kraetschmer BG:** Multiple Level Endoscopic Transperitoneal Lumbar Interbody Fusion. Canadian Orthopaedic Association, Hamilton, Ontario, Jun 1997.
19. **Lieberman IH, Orr RD, Salo PT, Kraetschmer BG:** The results of Simultaneous Endoscopic Anterior Release and Posterior Instrumentation for Spinal Deformity. Canadian Orthopaedic Association, Hamilton, Ontario, Jun 1997.
20. **Lieberman IH, Orr RD, Salo PT, Kraetschmer BG:** The results of Simultaneous Endoscopic Anterior Release and Posterior Instrumentation for Spinal Deformity. Combined Meeting of English Speaking Orthopaedic Associations. Auckland New Zealand, Feb 1998.
21. **Lieberman IH, Davros W, Kuzhupilly RR:** Utility of 3-D CT Volume Rendering in Endoscopic Thoracoplasty. NASS Spine Across the Sea 2000, Kamuela Hawaii, July 2000.
22. **Lieberman IH, Kuzhupilly RR:** Initial Stability of FRA Spacers in ALIF with Integrated Crossed Anterior Screws, An In Vitro Analysis. NASS Spine Across the Sea 2000, Kamuela Hawaii, July 2000.
23. **Lieberman IH, Dudeney S, Reinhardt M-K:** Early Experience with Kyphoplasty in the Treatment of Painful Osteoporotic Vertebral Compression Fractures. NASS Spine Across the Sea 2000, Kamuela Hawaii, July 2000.
24. **Lieberman IH, Dudeney S, Phillips F:** Inflatable Bone Tamp Kyphoplasty in the Treatment of Osteoporotic Compression Fractures. Eurospine 2000, Antwerp Belgium, October 2000.
25. **Lieberman IH, Dudeney S, Phillips F, Reinhardt M-K, Bell G:** The Treatment of Kyphotic Deformity using Kyphoplasty for Vertebral Compression Fractures. SRS Annual meeting, Cairns Australia, October 2000.
26. **Lieberman IH, Dudeney S, Phillips F, Bell G:** Initial Clinical Outcome with Kyphoplasty for Osteoporotic Vertebral Compression Fractures. NASS Annual Meeting, New Orleans Louisiana, October 2000.
27. **Lieberman IH, Dudeney S:** Landmarks for extrapedicular cannulation of the vertebral body. NASS Annual Meeting, New Orleans Louisiana, October 2000.
28. **Lieberman IH, Dudeney S, Reinhardt MK, Bell G:** Initial Clinical Outcome and efficacy of Kyphoplasty in the treatment of Painful Osteoporotic Compression Fractures. AAOS Annual Meeting, San Francisco California, February 2000.
29. **Lieberman IH, Mitchell W, Dudeney S, Reinhardt MK:** Clinical Outcome with Kyphoplasty for Osteoporotic Vertebral Compression Fractures. NASS Annual Meeting, Seattle Washington, October 2001.
30. **Lieberman IH, Dudeney S, Hussein M, Reinhardt MK:** Kyphoplasty in the treatment of Vertebral Compression Fractures secondary to Multiple Myeloma. NASS Annual Meeting, Seattle Washington, October 2001.

31. **Lieberman IH**, Mitchell W, Dudeney S, Reinhardt MK: Clinical Outcome with Kyphoplasty for Osteoporotic Vertebral Compression Fractures. AAOS Annual Meeting, Dallas Texas, February 2002.
32. **Lieberman IH**, Hussein H, Reinhardt MK: Clinical Outcome of Vertebral Augmentation for Osteolytic Collapse. IMAST 10<sup>th</sup> Annual Meeting, Rome Italy, July 2003.
33. **Lieberman IH**, Togawa D, Bauer TW, Reinhardt MK: Unsuspected Myeloma and Low-Grade Osteomalacia Observed in Biopsies Obtained from Patients with Osteoporotic Compression Fractures During Kyphoplasty. IMAST 10<sup>th</sup> Annual Meeting, Rome Italy, July 2003.
34. **Lieberman IH**, Fleming JE, Reinhardt MK, Richmond B, McLain R, Muschler GF: Intraoperative Concentration of Human Bone Marrow Progenitors in Lumbar Interbody Fusion. IMAST 10<sup>th</sup> Annual Meeting, Rome Italy, July 2003.
35. **Lieberman IH**, Reinhardt MK, Hussein M: Clinical outcome of vertebral augmentation for osteolytic collapse. AAOS 71<sup>st</sup> annual meeting, San Francisco, March 2004.
36. **Lieberman IH**, Reinhardt MK, Hussein M: Clinical outcome of vertebral augmentation for osteolytic collapse. Spine Week 2004, Spine Society of Europe annual meeting, Porto Portugal, June 2004.
37. **Lieberman IH**, Togawa D, Khanna AJ, Reinhardt MK, Stefancin J, Holman P: Clinical results of Kyphoplasty for Osteoporotic and Osteolytic Vertebral Compression Fractures. World Spine III, Rio de Janeiro, Brazil, August 2005.
38. **Lieberman IH**, Togawa D, Reinhardt MK, McLain R, Richmond B, Fleming JE, Boehm C, Muschler G: Two year follow up for lumbar interbody fusion using allograft composites augmented with osteoprogenitors selected by stem cell retention system. World Spine III, Rio de Janeiro, Brazil, August 2005.
39. **Lieberman IH**, Mroz T, Yamashita T: The on and off label use of rhBMP-2 Infuse in Medicare and Non-Medicare Patients. NASS 23<sup>rd</sup> annual meeting, Toronto, Canada, 2008
40. Yamashita T, Siemionow K, Mroz T, Podichetty V, **Lieberman IH**. A Prospective Analysis of Prognostic Factors in Patients With Spinal Metastases - Use of The Revised Tokuhashi Score. IMAST 16<sup>th</sup> Annual Meeting, Vienna, Austria, 2009
41. Yamashita T, Siemionow K, Mroz T, Podichetty V, **Lieberman IH**. Relation Between Health-Related Quality of Life Score And Survival in The Patients With Spinal Metastases - A Prospective Analysis. IMAST 16<sup>th</sup> Annual Meeting, Vienna, Austria, 2009
42. **Lieberman IH**. Biomechanical and fatigue properties of percutaneous trans-pedicular fixation accompanied by facet screw fixation in the lumbar spine. 2<sup>nd</sup> World Congress of Minimally Invasive Spine Surgery & Techniques, Las Vegas, USA, June 2010,

## Poster Presentations, Scientific Exhibits and Movie Presentations

1. **Lieberman IH:** Endoscopic L5-S1 BAK spinal fusion. (Live Surgical Demonstration) Deaconess Hospital, Amsterdam, The Netherlands, Nov 24, 1995.
2. **Lieberman IH:** Endoscopic L5-S1 BAK spinal fusion. (Live Surgical Demonstration) Toronto Endoscopic Spine Surgery Symposium and Workshop, University of Toronto, Toronto, Ontario, May 18, 1996.
3. **Lieberman IH:** Endoscopic L5-S1 BAK spinal Fusion. (Live Surgical Demonstration) Toronto Endoscopic Spine Surgery Symposium and Workshop, University of Toronto, Toronto, Ontario, May 17, 1997.
4. **Lieberman IH, Asante DK, Salo PT, Kraetschmer BG:** A prospective study to determine the outcome of surgery in the treatment of spinal stenosis using the Oswestry Disability Index and the SF-36 Health Survey. (Poster Presentation) Canadian Orthopaedic Association, Quebec City, Quebec. 1996.
5. **Lieberman IH, Woodside T:** Anterior Vertebral body screw testing: Comparison of Zielke, Kaneda, USS, and USS with pull out resistant washer. (Poster Presentation) Canadian Orthopaedic Research Society, Quebec City, Quebec. 1996.
6. **Lieberman IH, Litwin DE, Salo PT, Kraetschmer BG:** Anterior interbody fusion using the BAK device: Pitfalls and complications. (Poster Presentation) Canadian Orthopaedic Association, Quebec City, Quebec. 1996.
7. **Lieberman IH, Orr RD, Salo PT, Kraetschmer BG:** The results of Simultaneous Endoscopic Anterior Release and Posterior Instrumentation for Spinal Deformity. (Poster Presentation) North American Spine Society, New York, 1997.
8. **Lieberman IH:** Endoscopic L5-S1 BAK spinal fusion. (Live Surgical Demonstration) Advances in Endoscopic Spine Surgery, A Symposium and Workshop, The Cleveland Clinic, May 1998.
9. **Lieberman IH, Salo PT, Litwin D, Kraetschmer BG:** Two Level Anterior Endoscopic Transperitoneal BAK Lumbar Fusion. (Video Demonstration) American Academy of Orthopaedic Surgeons Annual Meeting, New Orleans, Mar 1998.
10. **Yee A, Lieberman IH, Salo PT, Bhatia C, Kraetschmer BG:** A Prospective analysis of Anterior Cervical Discectomy and Fusion using the Modified ODI and the SF-36 outcome instruments. (Poster Presentation) Combined Meeting of English Speaking Orthopaedic Associations. Auckland New Zealand, Feb 1998.
11. **Lieberman IH, Asante DK, Bhatia C, Salo PT, Kraetschmer BG:** A prospective study to determine the outcome of surgery in the treatment of spinal stenosis using the Oswestry Disability Index and the SF-36 Health Survey. (Poster Presentation). Combined Meeting of English Speaking Orthopaedic Associations. Auckland New Zealand, Feb 1998.
12. **Willshir PC, Lieberman IH, Salo PT, Litwin DEM, Kraetschmer BG:** Transperitoneal Laparoscopic Exposure for Lumbar Interbody Fusion. (Poster Presentation). Combined Meeting of English Speaking Orthopaedic Associations. Auckland New Zealand, Feb 1998.
13. **Lieberman IH:** Endoscopic L5-S1 BAK spinal fusion. (Live Surgical Demonstration) Sulzer Spine-Tech, New Technology Seminar. Teleconference Cleveland-San Francisco, October 1998.

14. **Lieberman IH, Bauer T, Salo PT, Kraetschmer BG:** Histology of a Retrieved Interbody Fusion Cage. (Poster Presentation). North American Spine Society. San Francisco. 1998.
15. **Lieberman IH, Willsher PT, Salo PT, Litwin D:** Transperitoneal Laparoscopic Exposure for lumbar Interbody Fusion. (Poster Presentation). North American Spine Society. San Francisco. 1998.
16. **Lieberman IH:** Kyphoplasty. (Live Surgical Demonstration) Kyphoplasty, A Symposium & Hands On Workshop, The Cleveland Clinic Foundation, Dept of Orthopaedics & The Minimally Invasive Surgery Center. December 1999 & January 2000.
17. **Lieberman IH, Dudeney S, Phillips F:** Inflatable Bone Tamp Kyphoplasty in the Treatment of Osteoporotic Compression Fractures. (Poster Presentation). Osteoporosis World Congress. Chicago Illinois, Dec 2000.
18. **Lieberman IH, Dudeney S, Phillips F:** Inflatable Bone Tamp Kyphoplasty in the Treatment of Osteoporotic Compression Fractures. (Poster Presentation). Association Bone Mineral Research Annual Meeting, Toronto Canada, December 2000.
19. **Lieberman IH, Dudeney S, Hussein M:** Kyphoplasty in the Treatment of Osteolytic Compression Fractures due to Myeloma.(Poster Presentation). Oncology Association Meeting. Banff Canada, April 2001.
20. **Garfin S, Yuan H, Lieberman IH, Phillips F:** Early outcomes in the minimally invasive reduction and fixation of compression fractures. (Poster Presentation). NASS Annual Meeting, New Orleans Louisiana, October 2000.
21. **Kuzhupilly RR, Lieberman IH, McLain R, Nair D, Najm I:** Modified Anaesthetic Protocol for Electromyography Monitoring During Anterior Endoscopic Instrumentation. (Poster Presentation). Eurospine 2000. Antwerp Belgium, October 2000.
22. **Lieberman IH, Davros W, Kuzhupilly RR:** 3-D CT Volume Rendering Techniques in Endoscopic Thoracoplasty. (Poster Presentation). Eurospine 2000. Antwerp Belgium, October 2000.
23. **Single D, Lieberman IH, Dudeney S, Steiner C, Reinhardt MK:** The Measurement of Volume Restoration Improvement after Kyphoplasty. (Poster Presentation). NASS Annual Meeting, Seattle Washington, October 2001.
24. **Dudeney S, Hussein M, Reinhardt MK, Lieberman IH.** The use of Kyphoplasty in Multiple Myeloma patients with vertebral compression fractures. (Poster Presentation). AAOS Annual Meeting, Dallas Texas, Feb 2002.
25. **Leon SP, Lieberman IH, Reinhardt MK.** Multiple cement application cavity containment kyphoplasty: technique description and efficacy. (Poster Presentation). AAOS Annual Meeting, Dallas Texas, Feb 2002.
26. **Harrop J, Reinhardt MK, Lieberman IH, Prpa B:** Incidence of remote and adjacent fractures after Kyphoplasty. (Poster presentation). NASS 17<sup>th</sup> Annual Meeting. Montreal Canada, Nov 2002.
27. **Kayanja M, Ferrara L, Lieberman IH:** Distribution of anterior cortical strain in a simulated osteoporotic vertebral compression fracture. (Poster presentation). NASS 18<sup>th</sup> Annual Meeting. San Diego CA, Oct 2003.
28. **Lieberman IH, Reinhardt MK, Hussein M:** Clinical outcome of vertebral augmentation for osteolytic collapse. (Poster Presentation). NASS 18<sup>th</sup> Annual Meeting. San Diego CA, Oct 2003.

29. **Dalcanto R, Ferrara L, Inceoglu S, Kayanja M, Lieberman IH:** Biomechanical comparison of transarticular facet screws to lateral mass plates in two level fusions of the cervical spine. (Poster Presentation). NASS 18<sup>th</sup> Annual Meeting. San Diego CA, Oct 2003.
30. **Kovacic J, Lieberman IH, Togawa D, Bauer T, Brodke D, Reinhardt MK:** The gross & histologic behavior of PMMA during kyphoplasty and vertebroplasty(Poster Presentation). AAOS 71<sup>st</sup> annual meeting, San Francisco, March 2004.
31. **Stewart T, Sasso R, Lieberman IH:** Translaminar Screw Fixation of the Lumbar Spine. (Video Presentation). AAOS 71<sup>st</sup> annual meeting, San Francisco, March 2004.
32. **Kovacic J, Lieberman IH, Togawa D, Bauer T, Brodke D, Reinhardt MK:** The behavior of PMMA during kyphoplasty and vertebroplasty in the primate spine. (Poster Presentation). Spine Week 2004, Spine Society of Europe Annual Meeting, Porto, Portugal, June 2004.
33. **Khanna J, Lieberman IH, Reinhardt MK:** The Clinical and Functional Outcome of Kyphoplasty for Osteoporotic Vertebral Compression Fractures. (Poster Presentation). Spine Week 2004, Spine Society of Europe Annual Meeting, Porto, Portugal, June 2004.
34. **Togawa D, Lieberman IH, Bauer TW, Reinhardt MK:** A diagnostic biopsy can be helpful for vertebral compression fractures; osteomalacia and unsuspected myeloma. (Poster Presentation). Spine Week 2004, Spine Society of Europe Annual Meeting, Porto, Portugal, June 2004.
35. **Lieberman IH, Hussein M, Reinhardt MK:** Clinical Outcome of Vertebral Augmentation for Osteolytic Collapse. (Poster Presentation). Spine Week 2004, Spine Society of Europe Annual Meeting, Porto, Portugal, June 2004.
36. **Togawa D, Lieberman IH, Muschler G, Reinhardt MK, Richmond B, Fleming J:** Clinical and Radiographic Outcomes of Lumbar Interbody Fusion Using Allograft Enriched with Bone Marrow Derived Cells Prepared by Selective Stem Cell Retention. (Electronic Poster Presentation) 11<sup>th</sup> IMAST annual meeting, Bermuda, July 2004.
37. **Togawa D, Lieberman IH, McLain RF, Fleming JE, Reinhardt MK, Boehm C, Muschler GF.** Selective stem cell retention for intraoperative preparation of composites enriched with bone marrow aspirates for spine surgery. (Electronic Poster Presentation). Scoliosis Research Society 39<sup>th</sup> annual meeting, Buenos Aires, Argentina, 2004.
38. **Khanna AJ, Reinhardt MK, Togawa D, Stefancin J, Holman P, Lieberman IH.** Functional outcomes of kyphoplasty for the treatment of spinal metastases. (Electronic Poster Presentation). Scoliosis Research Society 39<sup>th</sup> annual meeting, Buenos Aires, Argentina, 2004.
39. **Togawa D, Lieberman IH, McLain RF, Richmond BJ, Fleming JE, Reinhardt, MK.** Clinical and radiographic outcomes of lumbar interbody fusion using allograft enriched with bone marrow derived cells prepared by selective stem cell retention. (Poster Presentation) North American Spine Society, 19<sup>th</sup> annual meeting, Chicago, 2004.
40. **Togawa D, Lieberman IH, Benzel E, Kayanja M, Reinhardt MK, Zahavi E.** Bone mounted miniature robot for spinal surgery. Accurate insertion for pedicle screws and translaminar facet screws in cadaveric experiments. (Electronic Poster Presentation) 12<sup>th</sup> International Meeting on Advanced Spine Techniques, Banff, Canada, 2005.

41. **Lee YP, Togawa D, Rosneck J, Lieberman IH.** Efficacy of pull-out resistant nuts in preventing screw pullout in anterior spinal fusion in adolescent idiopathic and adult scoliosis. (Electronic Poster Presentation) 12<sup>th</sup> International Meeting on Advanced Spine Techniques, Banff, Canada, 2005.
42. **Kayanja M, Evans K, Togawa D, Lieberman IH.** Adjacent vertebral level load transfer following augmentation using the technique of kyphoplasty with polymethylmethacrylate for vertebral compression fractures. (Electronic Poster Presentation) World Spine III, Rio de Janeiro, Brazil, Aug, 2005.
43. **Togawa D, Kayanja M, Benzel E, Reinhardt MK, Knoller N, Friedlander A, Lieberman IH.** Bone mounted miniature robotic guidance for pedicle and translaminar facet screw placement. (Poster presentation) AAOS 26th annual meeting. Chicago, IL. Poster 368, March 2006.
44. Mroz T, Yu W, Melillo A, **Lieberman IH.** Difference of x-ray versus MRI in detecting and quantifying lumbar spondylolisthesis. (Electronic Poster Presentation) 13<sup>th</sup> International Meeting on Advanced Spine Techniques, Athens, Greece, 2006.
45. **Lieberman IH,** Yamashita T, Tsai E, Kayanja M, Milks R. The biomechanics of sacral insufficiency fractures. (Electronic Poster Presentation) 13<sup>th</sup> International Meeting on Advanced Spine Techniques, Athens, Greece, 2006.
46. Yamashita T, Kayanja M, Milks R, **Lieberman IH.** Radiographic landmarks of the sacrum. (Electronic Poster Presentation) 13<sup>th</sup> International Meeting on Advanced Spine Techniques, Athens, Greece, 2006.
47. Mroz T, **Lieberman IH,** Yamashita T, Davros W. Radiation exposure to the patient and surgeon during kyphoplasty. (Electronic Poster Presentation) NASS 21<sup>st</sup> annual meeting, Seattle, WA, 2006
48. Yamashita T, Kayanja M, Milks R, **Lieberman IH.** Radiographic landmarks of the sacrum. (Electronic Poster Presentation) NASS 21<sup>st</sup> annual meeting, Seattle, WA, 2006
49. Kayanja M, **Lieberman IH,** Yamashita T, Tsai E, Milks R. The biomechanics of insufficiency fractures and augmentation of the sacrum. (Electronic Poster Presentation) NASS 21<sup>st</sup> annual meeting, Seattle, WA, 2006
50. Mroz T, **Lieberman IH,** Yu W, Melillo A, Tozzi J. Difference of x-ray versus MRI in detecting and quantifying lumbar spondylolisthesis. (Electronic Poster Presentation) NASS 21<sup>st</sup> annual meeting, Seattle, WA, 2006
51. Mroz T, **Lieberman IH,** Yamashita T, Davros W. Radiation exposure to the patient and surgeon during kyphoplasty. (Electronic Poster Presentation) 41<sup>st</sup> annual meeting of Scoliosis Research Society, Monterey, CA, 2006
52. Mroz T, **Lieberman IH,** Yamashita T, Davros W. Radiation exposure to the patient and surgeon during kyphoplasty. (Poster Presentation) AAOS annual meeting, 2007
53. Diulis C, Lee Y, Reinhardt MK, **Lieberman IH.** Clinical experience with anterior spinal fusion with pullout resistant nuts. (Electronic poster presentation) World Spine IV, Istanbul, Turkey, July 2007.
54. **Lieberman IH,** Hardenbrook M, Wang J, Guyer R, Khanna J. Radiation exposure using miniature robotic guidance for spinal surgery. (Electronic poster presentation) NASS annual mtg, Austin Tx, Oct 2007.
55. Jones A, Kayanja M, Milks R, **Lieberman IH.** Biomechanics of Posterior Hybrid Constructs Using Laminar Hooks and Pedicle Screws in Short Segment Thoracic Fixation. (Electronic poster presentation) NASS annual mtg, Austin Tx, Oct 2007.

56. Togawa D, **Lieberman IH**, et al. Histology of tissues within retrieved human titanium mesh cages. (Electronic poster presentation). 81st Annual Congress of the Japanese Orthopaedic Association. Sapporo, Japan, May 2008
57. Yamashita T, Siemionow K, Mroz T, **Lieberman IH**. A Prospective Analysis of Prognostic Factors in the Patients with Spinal Metastases- Use of the Revised Tokuehashi Score. (Electronic Poster) International Meeting on Advanced Spine Techniques, Hong Kong, 2008
58. Yamashita T, Siemionow K., Mroz T, **Lieberman IH**. Relation between health-related quality of life score and survival in the patients with spinal metastases -A prospective analysis. (Electronic Poster) International Meeting on Advanced Spine Techniques, Hong Kong, 2008
59. St Clair S, Tan JS, kayanja M, **Lieberman IH**. An evaluation of the kinematics and mode of failure of transpedicular lumbar interbody fixation. (Electronic Poster). International Meeting on Advanced Spine Techniques, Hong Kong, 2008
60. Yamashita T, Siemionow K, Mroz T, **Lieberman IH**. A prospective analysis of prognostic factors in patients with spinal metastases, use of the revised Tokuehashi score. (Electronic Poster). NASS 23<sup>rd</sup> annual meeting, Toronto, Canada, 2008
61. Lavelle W, Mroz T, **Lieberman IH**. Lumbar discectomy after selective nerve root blocks for patients with a lumbr disc herniation. (Electronic Poster). NASS 23<sup>rd</sup> annual meeting, Toronto, Canada, 2008
62. Yamashita T, Siemionow K., Mroz T, **Lieberman IH**. Relation between health-related quality of life score and survival in the patients with spinal metastases -A prospective analysis. (Electronic Poster). 43<sup>rd</sup> annual meeting of the Scoliosis Research Society, Salt Lake City, 2008
63. St. Clair S, Tan JS, **Lieberman IH**. Guided Oblique Lumbar Interbody Fixation: a biomechanical study in human cadaveric spines. (poster). SMISS 3<sup>rd</sup> annual meeting, Las Vegas 2008
64. St. Clair S, **Lieberman IH**. Guided Oblique Lumbar Interbody Fixation: a feasibility study. (poster). SMISS 3<sup>rd</sup> annual meeting, Las Vegas 2008
65. St. Clair S, **Lieberman IH**. Guided Oblique Lumbar Interbody Fixation: a surgical anatomic study. (oral poster). SAS 9<sup>th</sup> annual meeting, London England, 2009
66. St. Clair S, Siemionow K, **Lieberman IH**. Static and dynamic biomechanical properties of GOLIF in vertebrectomy model. (oral poster). SAS 9<sup>th</sup> annual meeting, London England, 2009
67. **Lieberman IH**, Benzel E, Linovitz R, Ross R. The results of a pilot study with a second generation total lumbar disc replacement. (poster). SAS 9<sup>th</sup> annual meeting, London England, 2009
68. Benzel E, **Lieberman IH**, Linovitz R, Ross R, Zimmers K. The benefits of a viscoelastic total disc replacement. (poster). SAS 9<sup>th</sup> annual meeting, London England, 2009
69. Ross R, **Lieberman IH**, Benzel E, Zimmers K, Kuras J. Stiffness – a key mechanical concept to understanding spinal function (poster). SAS 9<sup>th</sup> annual meeting, London England, 2009
70. St. Clair S, Tang Seng T, **Lieberman IH**. Guided Oblique Lumbar Interbody Fixation: a biomechanical study to compare against pedicle screws fixation. (oral poster). SAS 9<sup>th</sup> annual meeting, London England, 2009
71. Siemionow K, **Lieberman IH**. The implications of intraoperative fluid replacement on pulmonary complications in patients undergoing spine surgery; a review of 1398 cases. (electronic poster) IMAST 16<sup>th</sup> annual meeting, Vienna, Austria, 2009

72. Mariscalo M, Yamashita T, Steinmetz M, Bell G, **Lieberman IH**, Mroz T. Radiation exposure to the surgeon during open lumbar microdiscectomy and minimally invasive microdiscectomy. (electronic poster) IMAST 16th annual meeting, Vienna, Austria, 2009
73. Yamashita T, Steinmetz M, **Lieberman IH**, Mroz T. The utility of repeated post operative radiographs following lumbar instrumented fusion? (electronic poster) IMAST 16th annual meeting, Vienna, Austria, 2009
74. St Clair S, Tan JS, **Lieberman IH**. Oblique lumbar interbody screw fixation (OLIF): a biomechanical study in human spines versus pedicle screw fixation. (electronic poster) EuroSpine 2009 annual meeting. Warsaw, Poland, 2009
75. **Lieberman IH**, Benzel E, Ross R, Zimmer K. Pilot study with a viscoelastic lumbar total disc replacement. (poster) AAOS 30th annual meeting. New Orleans, March 2010, Poster 384.

### **Other Lectures or Papers Given**

1. University of Toronto, Orthopaedic Residents' Research Day, Toronto, Ontario, Oct 1988. Morphology and mineralization of bone in the femoral heads of rheumatoid arthritis patients.
2. University of Toronto, Kennedy Day, Toronto, Ontario, May 1991. Heterotopic ossification after primary cemented and cementless total hip arthroplasty involving patients with rheumatoid arthritis and osteoarthritis.
3. University of Toronto, Kennedy Day, Toronto, Ontario, May 1992. Functional outcome following posterior shoulder repair.
4. North American Travelling Fellows, Wellesley Hospital, Toronto, Ontario, Oct 1994. Endoscopic spinal surgery: Indications and examples.
5. University of Toronto, Keith Visiting Professorship in Neurosurgery, Toronto, Ontario, Feb 1995. Endoscopic spinal surgery: Indications and examples.
6. Division of Orthopaedics, Residents Down Day Curriculum, Toronto, Ontario, Mar 1995. Classification of spinal fractures.
7. ASG Travelling Fellows, Hospital for Sick Children, Toronto, Canada, Mar 1995. Endoscopic spinal surgery: Indications and examples.
8. Gallie Day, University of Toronto, Toronto, Ontario, Apr 1995. Endoscopic spinal surgery: Indications and examples.
9. Department of Anaesthesia, The Toronto Hospital, Toronto, Ontario, Apr 1995. Prevention of blood loss in spinal surgery.
10. Kennedy Day, University of Toronto, Division of Orthopaedics, Toronto, Ontario, May 1995. Endoscopic spinal surgery: Indications and examples.
11. Division of Orthopaedics, Residents Down Day Curriculum, Toronto, Ontario, May 1995. Vertebral osteomyelitis and discitis.
12. University of Toronto, Department of Family Practice, Toronto, Ontario, Jun 1995. Management of back pain.
13. Division of Orthopaedics, Residents Down Day Curriculum, Toronto, Ontario, Jun 1995. The cervical spine in rheumatoid arthritis.
14. Toronto East General Hospital, Surgical Grand Rounds, Toronto, Ontario, Sep 6, 1995. Endoscopic spinal surgery.
15. Division of Orthopaedics, Residents Down Day Curriculum, Toronto, Ontario, Oct 16, 1995. Endoscopic spinal surgery for degenerative disease of the spine.
16. University of Toronto, Trauma Update 95, Toronto, Ontario, Oct 22, 1995. Diagnosis and management of thoracolumbar fractures.
17. Division of Orthopaedics, Resident's Down Day Curriculum, Toronto, Ontario, Oct 23, 1995. Complications in deformity surgery.
18. University of Toronto, Arthritis Day, Toronto, Ontario, Feb 8, 1996. Panel: The problem of back pain.
19. ASG Travelling Fellows, The Mount Sinai Hospital, Toronto, Ontario, Mar 22, 1996. Shared decision-making in patients with back pain.

20. Combined Arthritis Program Research Rounds, The Toronto Hospital, Toronto, Ontario, Mar 29, 1996. What we are doing in spines.
21. Kennedy Day, University of Toronto, Division of Orthopaedics, Toronto, Ontario, May 1996. Endoscopic transthoracic release for adult scoliosis.
22. Toronto Endoscopic Spine Surgery Symposium and Workshop, University of Toronto, Department of Surgery, Toronto, Ontario, May 17, 1996 - May 18, 1996. (1) Alternative approaches to endoscopic disc surgery, (2) BAK results and complications, (3) Endoscopic transthoracic approaches, (4) Workshop: Animal and cadaver lab.
23. Telemedicine Canada, (Satellite Teleconference), Toronto, Ontario, May 21, 1996. Current management of scoliosis and kyphosis.
24. Keith Visiting Professorship in Neurosurgery, University of Toronto, Toronto, Ontario, Feb 11, 1997. Endoscopy for Spinal Deformity Surgery.
25. ASG Travelling Fellows, Sunnybrook Hospital, Toronto, Ontario, Mar 1997. Endoscopic Transthoracic Release for Spinal Deformity.
26. Telemedicine Canada, (Satellite Teleconference), Toronto, Ontario, Apr 29, 1997. Endoscopic Spinal Fusions.
27. Kennedy Day, University of Toronto, Division of Orthopaedics, Toronto, Ontario, May 1, 1997. Endoscopic Transthoracic Release for Spinal Deformity.
28. Toronto Endoscopic Spine Surgery Symposium and Workshop, University of Toronto, Department of Surgery, Toronto, Ontario, May 16, 1997. 1) Overview of Minimally Invasive Spine Surgery, 2) Technique of Endoscopic BAK Lumbar Spinal Fusions, 3) Indications and Techniques of Endoscopic Transthoracic Discectomies, 4) Simultaneous Endoscopic Anterior and Open Posterior Spinal Surgery, 5) Workshop: sawbones and animal lab.
29. Advances in Endoscopic Spine Surgery. A symposium & workshop. The Cleveland Clinic Foundation, January 1998. 1) Overview of Minimally Invasive Spine Surgery, 2) Technique of Endoscopic BAK Lumbar Spinal Fusions, 3) Indications and Techniques of Endoscopic Transthoracic Discectomies, 4) Simultaneous Endoscopic Anterior and Open Posterior Spinal Surgery, 5) Workshop: sawbones and animal lab.
30. Advances in Endoscopic Spine Surgery. A symposium & workshop. The Cleveland Clinic Foundation, May 1998. 1) Overview of Minimally Invasive Spine Surgery 2) Complications of Endoscopic BAK Lumbar Spinal Fusions 3) Transthoracic Endoscopic Techniques for Spinal Deformity 4) Workshop: sawbones and animal lab.
31. Cleveland Clinic Foundation, Dept of Orthopaedics, Residents Teaching Conference, Rheumatoid Cervical Spine, Apr. 1998.
32. Cleveland Clinic Foundation, Dept of Orthopaedics, Grand Rounds, June 1998.
33. Cleveland Clinic Foundation, Chautauqua Institution Health Talks, July 1998. Surgical options for common spinal disorders.
34. Cleveland Clinic Foundation, Community Health Talks, August 1998. Surgical options for common spinal disorders.
35. Cleveland Clinic Foundation, Board of Trustees Meeting, August 1998. State of the Art in Minimally Invasive Spinal Surgery.
36. Cleveland Clinic Foundation, Dept of Medicine, Grand Rounds, August 1998. State of the Art in Minimally Invasive Spinal Surgery.

37. Cleveland Clinic Foundation, Contemporary Spine Care for the Primary Care Physician, November 1998. Minimally Invasive techniques in Spinal Surgery.
38. Cleveland Clinic Foundation, Dept of Orthopaedics, Grand Rounds, April 1999.
39. Cleveland Clinic Foundation, Taussig Cancer Center & Multiple Myeloma Program, April 1999. Skeletal Manifestations and Surgical Intervention for Multiple Myeloma.
40. Cleveland Clinic Foundation, Sports Medicine & Orthopaedic Rehab Symposium, May 1999. 1)The Unstable Spine 2)The Herniated Disc
41. Cleveland Clinic Foundation, Dept of Orthopaedics, Greenbriar Symposium, July 1999. 1)Clearing the Cervical Spine for Surgery & Athletic Participation 2)Anterior Spinal Fusion, Why, When & How.
42. Cleveland Clinic Foundation, Dept of Orthopaedics & The Minimally Invasive Surgery Center, Grand Rounds, November 1999. Kyphoplasty for Osteoporotic Compression Fractures.
43. Kyphoplasty, A Symposium & Hands On Workshop, The Cleveland Clinic Foundation, Dept of Orthopaedics & The Minimally Invasive Surgery Center. December 1999. 1)Historical Overview 2)Kyphoplasty technique 3)Initial Outcome & Results 4)Cadaver workshop.
44. Cleveland Clinic Foundation, Dept of Orthopaedics, Grand Rounds, February 2000.
45. Spine Care 2000, A Common Sense Approach, The Cleveland Clinic Foundation, (Fort Lauderdale, FLA), March 2000. 1)Case Presentations 2)Lumbar Disc Herniations 3)Surgical Treatment for Osteoporosis 4)Scoliosis Recognition & Management.
46. Kyphoplasty, A Symposium & Hands On Workshop, The Cleveland Clinic Foundation, Dept of Orthopaedics & The Minimally Invasive Surgery Center. January/February/April/June 2000. 1)Historical Overview 2)Kyphoplasty technique 3)Initial Outcome & Results 4)Cadaver workshop.
47. Plasma Cell Dyscrasia: Past Present & Future. The Cleveland Clinic Foundation, Taussig Cancer Center & Multiple Myeloma Program, April 2000. Skeletal Manifestations and Surgical Intervention for Multiple Myeloma.
48. Osteoporosis Management Symposium. The Cleveland Clinic Foundation, Dept of Orthopaedics & The Osteoporosis Clinic, April 2000. Kyphoplasty a New technique for the Management of Osteoporotic Compression Fractures.
49. Cleveland Clinic Foundation, Dept of Orthopaedics, ABC Travelling Fellows Visit, May 2000. Kyphoplasty a New technique for the Management of Osteoporotic Compression Fractures.
50. Cleveland Clinic Foundation, Spine Hands on Review Course. Depts of Neurosurgery & Orthopaedics. August 2000. 1)Minimally Invasive Spine Surgery, State of the Art 2) Operative Management of Spinal deformity 3)Kyphoplasty for Vertebral Compression Fractures
51. Cleveland Clinic Foundation, Innovative Spine Care: Essential Skills for the Nursing Team. Depts of Neurosurgery & Orthopaedics, & the Spine Center. October 2000. 1)Scoliosis Current Concepts 2) Interbody Cages Current Concepts
52. Cleveland Clinic Foundation, "Fantastic Voyage, the Operating Room of the Future". The Minimally Invasive Surgery Center. October 2000. 1)Minimally Invasive Spinal Surgery, State of the Art.
53. Kyphoplasty, A Symposium & Hands On Workshop, The Cleveland Clinic Foundation, Dept of Orthopaedics & The Minimally Invasive Surgery Center. September/November 2000, February/April/June 2001. 1)Historical Overview 2)Kyphoplasty technique 3)Initial Outcome & Results 4)Cadaver workshop.

54. Cleveland Clinic Foundation, Worldcare, “Dubai Healthcare Shopping festival” (teleconference). CCF International Center. March 2001. 1) Minimally Invasive Spinal Surgery, State of the Art.
55. Plasma Cell Dyscrasia: Past Present & Future. The Cleveland Clinic Foundation, Taussig Cancer Center & Multiple Myeloma Program, April 2001. Skeletal Manifestations and Surgical Intervention for Multiple Myeloma.
56. Cleveland Clinic Foundation, Spine Hands on Review Course. Depts of Neurosurgery & Orthopaedics. May 2001. 1) Minimally Invasive Spine Surgery, State of the Art
57. Cleveland Clinic Foundation, Innovative Spine Care: Essential Skills for the Nursing Team. Depts of Neurosurgery & Orthopaedics, & the Spine Center. August 2001. 1) Scoliosis Current Concepts 2) Interbody Cages Current Concepts.
58. Cuyahoga Community College. “Something for everyone” lecture series. October 2001. 1) New developments in spinal surgery.
59. Plasma Cell Dyscrasia: Past Present & Future. The Cleveland Clinic Foundation, Taussig Cancer Center & Multiple Myeloma Program, April 2002. Skeletal Manifestations and Surgical Intervention for Multiple Myeloma.
60. Kyphoplasty, A Symposium & Hands On Workshop, The Cleveland Clinic Foundation, Dept of Orthopaedics & The Minimally Invasive Surgery Center. September & November 2001, March & May 2002. 1) Historical Overview 2) Kyphoplasty technique 3) Initial Outcome & Results 4) Cadaver workshop.
61. Cleveland Clinic Foundation, Grand Rounds 2002; 1) Department of Orthopaedics 2) Department of Oncology 3) Dept of Neurosurgery 4) Department of Endocrinology.
62. Cleveland Clinic Foundation, Fourth Annual Pain Management Conference, November 2002; 1) Vertebral Compression Fractures.
63. Kyphoplasty, A Symposium & Hands On Workshop, The Cleveland Clinic Foundation, Dept of Orthopaedics & The Minimally Invasive Surgery Center. September & November 2002, February & May 2003 1) Historical Overview 2) Kyphoplasty technique 3) Initial Outcome & Results 4) Cadaver workshop.
64. Cleveland Clinic Foundation, 5<sup>th</sup> Annual Pain Management & Regional Anesthesia Symposium, Key West Florida, February 2003, 1) Anatomy & Radiology of the Spine, 2) Vertebral Augmentation for Osteoporotic and Osteolytic Compression Fractures, 3) Complications of Vertebroplasty and Kyphoplasty.
65. Cleveland Clinic Foundation, Internal Medicine Grand Rounds, April 2003. 1) Vertebral augmentation for Osteoporotic & osteolytic fractures
66. Cleveland Clinic Foundation, Department of Orthopaedics, Jefferson Lecture, March 2003. 1) Nepal & Everest, a contrast of extremes.
67. Cleveland Clinic Foundation, Speaking of Women’s Health, May 2003. 1) Spinal Manifestations of Osteoporosis.
68. Cleveland Clinic Foundation, Orthopaedics Basic Science Lecture, May 2003. 1) Intervertebral Disc, Biology, Biomechanics & Disc Substitutes.
69. Cleveland Clinic Foundation, Orthopaedics Research Day. May 2003. 1) A Himalayan Approach to Clinical Research.
70. Cleveland Clinic Foundation, Spine Review Hands-On 2003 Course. Depts of Neurosurgery & Orthopaedics. August 2003. 1) Minimally Invasive Spine Surgery, State of the Art 2) Dorsal Cervical Fixation 3) Kyphoplasty for Vertebral Compression Fractures 4) Stem Cells for Spinal fusion.

71. Kyphoplasty, A Symposium & Hands On Workshop, The Cleveland Clinic Foundation, Dept of Orthopaedics & The Minimally Invasive Surgery Center. August & October 2003. 1) Historical Overview 2) Kyphoplasty technique 3) Initial Outcome & Results 4) Cadaver workshop.
72. Clinic Foundation, Minimally Invasive Surgery Center, 2<sup>nd</sup> Annual Retreat, October 2003. 1) Update on Orthopaedic and Spinal MIS procedures.
73. Cleveland Clinic Foundation, Speaking of Women's Health, April 2004.  
1) Spinal Manifestations of Osteoporosis
74. Cleveland Clinic Foundation, Spine Review Hands-On 2004 Course. Depts of Neurosurgery & Orthopaedics. May 2004. 1) Minimally Invasive Spine Surgery, State of the Art 2) Dorsal Cervical Fixation 3) Kyphoplasty for Vertebral Compression Fractures 4) Stem Cells for Spinal fusion.
75. Cleveland Clinic Foundation, Orthopaedics Research Day. May 2004.  
1) The Biomechanics of Vertebral Compression Fractures.
76. Cleveland Clinic Foundation, Bone Summit 2004. May 2004. 1) Local mechanical intervention; Vertebroplasty & Kyphoplasty 2) Local cell delivery strategies, Selective Stem Cell Retention.
77. Cleveland Clinic Orthopaedic Symposium, CCF International Center, July 2004. **Course Director.** 1) Minimally Invasive Spine Surgery, State of the Art 2) Kyphoplasty for Vertebral Compression Fractures 3) Stem Cells for Spinal fusion.
78. Cleveland Clinic Orthopaedic Alumni Association Conference, Sept 2004. 1) Disc Arthroplasty, why, what & who is going to pay for it?
79. Cleveland Clinic Spine Grand Rounds, Oct 2004. 1) Disc Arthroplasty, why, what & who is going to pay for it?
80. Cleveland Clinic 7<sup>th</sup> annual update in Neuroscience Nursing, Nov 2004. 1) Kyphoplasty 2) Challenging Mt Everest and Mt Kilimanjaro
81. Cleveland Clinic 5<sup>th</sup> Annual Orthopaedic Excellence Through Education Symposium, April 2005. 1) Minimally Invasive Spinal Surgery
82. Cleveland Clinic Foundation, 1<sup>st</sup> Annual Women's Health Summit, April 2005. 1) Minimally Invasive treatments for Vertebral Compression Fractures
83. Cleveland Clinic Health Talks, Arthritis Expo, May 2005. 1) Causes of back pain
84. Cleveland Clinic Foundation, Spine Review Hands-On 2005 Course. Cleveland Clinic Spine Institute. July 2005. **Course co-director.** 1) Fraud, Abuse & Anti-kickback legislation 2) Dorsal Cervical Fixation 3) Biomechanics of motion preservation.
85. Kyphoplasty, A Symposium & Hands On Workshop, The Cleveland Clinic Foundation, Cleveland Clinic Spine Institute, the Minimally Invasive Surgery Center. April & July 2005. 1) Historical Overview 2) Kyphoplasty technique 3) Initial Outcome & Results 4) Cadaver workshop.
86. Cleveland Clinic Radiation Oncology; Image Guided Stereotactic Conformal Radiotherapy Training Course. Sept 2005. 1) Spinal radiotherapy, the Orthopaedist's perspective.
87. The Cleveland Clinic & Stryker Spine MIS Symposium. Oct 2005. **Course Director.** 1) LUXOR retractor system 2) Cadaver workshop

88. Cleveland Clinic Innovations Summit, from Bench to Bedside. Oct 2005. **Program Co-Chairman.** 1)live surgical demonstration minimally invasive spinal fusion 2) innovative spine techniques panel discussion
89. Cleveland Clinic Foundation, Community Health Talks, December 2005. Spinal Surgery: what's new and is it for you.
90. Cleveland Clinic Foundation, 8th Annual Pain Management Symposium, February 2006. Orlando Fla. 1) Disc Replacement Surgery 2) Open surgery for lumbar disc disease 3) Kyphoplasty for compression fractures
91. Cleveland Clinic Foundation, Axialif Hands on Training. Apr 2006. **Course Director.** 1) Axialif technique, Indications and Clinical Outcome 2) Hands on cadaver lab instructor
92. Cleveland Clinic Bone Innovation Summit 2006. May 2006. 1) Treatment of Vertebral Compression fractures with vertebroplasty and kyphoplasty
93. Cleveland Clinic Radiation Oncology; Image Guided Stereotactic Conformal Radiotherapy Training Course. June 2006. 1) Spinal radiotherapy, the Orthopaedist's perspective.
94. Cleveland Clinic Foundation, Axialif Hands on Training. June 2006. **Course Director.** 1) Axialif technique, Indications and Clinical Outcome 2) Hands on cadaver lab instructor
95. Cleveland Clinic Foundation, Spine Review Hands-On 2006 Course. Cleveland Clinic Spine Institute. July 2006. **Course co-director.** 1) Fraud, Abuse & Anti-kickback legislation 2) Coding update 3) Biomechanics of motion preservation 4) case discussions
96. Cleveland Clinic Foundation, Axialif Hands on Training. July 2006. **Course Director.** 1) Axialif technique, Indications and Clinical Outcome 2) Hands on cadaver lab instructor
97. Cleveland Clinic Foundation, Axialif Hands on Training. August 2006. **Course Director.** 1) Axialif technique, Indications and Clinical Outcome 2) Hands on cadaver lab instructor
98. Cleveland Clinic Foundation, Residents Academic Day, Nov 2006. 1) spondylolisthesis
99. Cleveland Clinic Foundation, Neurosurgery Grand Rounds, Dec 2006. 1) vertebral body biopsies
100. Cleveland Clinic Health Exchange Community Talk, Mandel Jewish Community Center, Feb 2007. 1) Degenerative Spines, what's new and is it for you?
101. Cleveland Clinic International Symposium on Stereotactic Body Radiation and Radiosurgery, Disney's Grand Floridian Resort, Florida, Feb 2007. 1) Economics of minimally invasive treatments
102. Cleveland Clinic Palliative Medicine 11<sup>th</sup> annual International Symposium, Hyatt Coconut point Resort, Florida, Mar 2007. 1) Spinal Cord Compression, the case for surgery 2) Long Bone Metastases, the surgeon can help 3) Treating Painful Vertebral Compression Fractures
103. Cleveland Clinic 3<sup>rd</sup> Annual Citigroup "Clinic at the Clinic". February 2007. 1) Update on Spinal Surgery, minimally invasive spine surgery, disc replacement, compression fractures and spinal stenosis
104. Cleveland Clinic Foundation, Spine Review Hands-On 2007 Course. Cleveland Clinic Spine Institute. July 2007. **Course co-director.** 1) Fraud, Abuse & Anti-kickback legislation 2) Coding update 3) Biomechanics of motion preservation 4) case discussions
105. Cleveland Clinic Foundation, Orthopaedics Research Day. June 2007. 1) An orthopaedist's attempt to climb the mountain and escape the sea of conflict of interest

106. Cleveland Clinic Florida, Internal Medicine Invitational Symposium. Mar 2008. 1) Contemporary concepts for the treatment of spinal metastases
107. Cleveland Clinic Florida, Academic Advancement Lecture Series. Apr 2008. 1) A Himalayan Approach to Innovations
108. Cleveland Clinic, Ethical Challenges in Surgical Innovation. May 2008 1) Moderator – Surgical Innovation and Ethical Dilemmas Panel Session
109. Cleveland Clinic Foundation, Spine Review Hands-On 2008 Course. Cleveland Clinic Spine Institute. July 2008. 1) Biomechanics of motion preservation 2) case discussions
110. Cleveland Clinic Florida, 1<sup>st</sup> Annual Comprehensive Orthopaedic, Spinal & Neurosurgical Update. Boca Raton, Sep 2008. 1) **Course Director** 2) Contemporary concepts in treating spinal metastases.
111. Cleveland Clinic Innovations Summit, Tel Aviv, Israel, Feb 2009, 1) Frontiers in Spine Surgery, where is clinical practice heading? 2) Panel discussion innovations in 2009
112. Cleveland Clinic Foundation, 11<sup>th</sup> Annual Pain Management & Regional Anesthesia Symposium, Ft Lauderdale, Florida, February 2009, 1) Lumbar Fusion and Disc Arthroplasty
113. Cleveland Clinic Florida, Maximizing the potential of the adolescent athlete. Weston, June 2009. 1) **Course Director** 2) Cervical Spine Injuries in Football 3) session moderator
114. Cleveland Clinic Florida, 2<sup>nd</sup> Annual Comprehensive Orthopaedic, Spinal & Neurosurgical Update. Weston, Oct 2009. 1) Session Moderator 2) Surgical treatment of vertebral compression fractures

### **VIDEOS/MOVIES PRODUCED**

- Endoscopic BAK Lumbar Fusion in the Pig. **Lieberman IH**, Salo PT, Litwin D, Kraetschmer BG. 1996
- Two Level Anterior Endoscopic Transperitoneal BAK Lumbar Fusion. **Lieberman IH**, Salo PT, Litwin D, Kraetschmer BG. 1996
- Endoscopic Transthoracic Discectomy. **Lieberman IH**, Salo PT, Kraetschmer BG. 1997
- Endoscopic Transthoracic Release for Spinal Deformity. **Lieberman IH**, Salo PT, Kraetschmer BG. 1997
- Translaminar Screw Fixation of the Lumbar Spine. Stewart T, Sasso R, **Lieberman IH**. 2003
- Selective Exposures in Orthopaedic Surgery; The Spine. Phillips FM, **Lieberman IH**, Hurford RK, Lenke LG, Orr RD, Riew KD, Won DS. American Academy of Orthopaedic Surgeons. 2004.
- Paracoccygeal L5S1 lumbar fusion, “Axialif procedure”. Live video webcast, June 29, 2006. **Lieberman IH**. [www.or-live.com/trans1/1672](http://www.or-live.com/trans1/1672)
- Paracoccygeal L5S1 lumbar fusion, “Axialif procedure”. Live web seminar, August 18th, 2006. **Lieberman IH**. <http://trans1training.com/content/presentations/Lieberman/>

## **PATENTS ISSUED and PENDING**

- 1) United States Patent US6468309 B1  
“Method and Apparatus for Stabilizing Adjacent Bones.” Issued October 2002
- 2) United States Patent US6488683 B2  
“Method and Apparatus for Correcting Spinal Deformity.” Issued December 2002
- 3) United States Patent US6527774 B2  
“Apparatus for Attaching Fractured Sections of Bone.” Issued March 2003
- 4) United States Patent US6551322 B1  
“Apparatus for Implantation into Bone.” Issued April 2003
- 5) United States Patent US6544265 B2  
“Apparatus for Implantation into Bone Related Applications.” Issued April 2003
- 6) United States Patent US6551319 B2  
“Apparatus for Implantation into Bone (Reverse Cone DHEVBA)” Issued April 2003
- 7) United States Patent US6551320 B2  
“Method and Apparatus for Correcting Spinal Deformity.” Issued April 2003
- 8) United States Patent US6689168 B2  
“Method and Apparatus for Stabilizing Adjacent Bones.” Issued February 2004
- 9) United States Patent US6953462 B2  
“Apparatus for Implantation into Bone.” Issued October 2005
- 10) United States Patent US7128761  
“Method and Apparatus for Replacing a Damaged Spinal Disc” Issued Oct 31 2006
- 11) United States Patent US7316689 B2  
“Apparatus for depositing bone graft material” Issued January 2008
- 12) United States Patent US7396360 B2  
“Minimally Invasive Method and Apparatus for Fusing Adjacent Vertebrae (aka TL screw jig)”  
Issued July 8 2008
- 13) United States Patent US7601167 B2  
“Apparatus for Implantation into Bone.” (starter tool method claims) Issued October 2009
- 14) United States Patent US7674266 B2  
“Percutaneous Vertebral Osteotomy Tool; Lateral Wall Cutter.” Issued March 2010
- 15) United States Patent US7674267 B2  
“Percutaneous Vertebral Osteotomy Tool; Lateral Wall Cutter.” Issued March 2010
- 16) United States Patent US7740635B2  
“Minimally Invasive Method and Apparatus for Placing Facet Screws and Fusing Adjacent Vertebrae (aka TL screw jig with bridge)” Issued June 22 2010
- 17) United States Patent application USXXXXXXX B2 # 11/823,048  
“Anti-Adhesion membrane” Issued July 2010

- 18) United States Patent application #10/540,380  
“Percutaneous Vertebral Osteotomy Tool; Articulated End Cutter” Filed Dec 2003
- 19) United States Patent application #10/621,015  
“L5S1 Apparatus for Lumbosacral Fixation” Filed July 2003
- 20) United States Patent application #10/731,964  
“Method and Apparatus for Replacing a Damaged Spinal Disc” Filed Dec 2003
- 21) United States Patent application #10/731,660  
“Method and Apparatus for Replacing a Damaged Spinal Disc” Filed Dec 2003
- 22) United States Patent application # 11/781017  
“Apparatus and method for body tissue fixation” (aka Merlot cervical plate) Filed July, 20 2007
- 23) United States Patent application # 12/178,995  
the “Fusion Patent” (aka GOLIF) Filed July 24, 2008
- 24) United States Patent application # 12/254,910  
the “Dynamic Stabilization Patent” (aka GOLIS) Filed Oct. 21, 2008
- 25) United States Patent application # 12/504,099  
“Apparatus and method for connecting body tissues”, (aka nerve & tendon sheath) Filed July 16, 2009
- 26) United States Patent application # 12/535,364  
“Facet Augmentation” Filed Aug 4, 2009

## **RESEARCH AND INVESTIGATION**

Principal Investigator's Name Appears in Bold

### **Research Funding - Peer Reviewed**

1)Allograft Cancellous Bone Augmented with Bone Marrow Aspirate for Lumbar Interbody Fusion; A Pilot Study. **Lieberman IH**, Kuzhupilly R, Muschler G, Flemming J. Funding = Dept of Orthopaedics & Research Programs Committee, The Cleveland Clinic Foundation (\$22,000)

2)The thermal effects of polymethylmethacrylate on the primate vertebral column after kyphoplasty. **Lieberman IH**, Kovacic J, Bauer T, Brodke D. Funding = Kyphon Inc (\$90,000)

3)Force Transmission Along the Normal and Osteoporotic Spine Following an Index Vertebral Compression Fracture. **Lieberman IH**, Kayanja M, Ferrara L. Funding = Dept of Orthopaedics & Research Programs Committee, The Cleveland Clinic Foundation (\$18,000)

4)Cortoss for Kyphoplasty. An FDA Multi-center Pilot Study. **Lieberman IH**, Reinhardt MK, Schlenk R. Funding = Orthovita Inc (\$35,000)

5)Surgical Robotics for Spine Surgery. **Lieberman IH**, Shoham M. Funding = The Cleveland Clinic & Technion University Development Fund (\$50,000/yr X 2)

6)Cervical Disc Replacement "PCM". An FDA Multi-center IDE Study. **Lieberman IH**, Schlenk R, Reinhardt MK. Funding = Cervitech Inc (\$98,000)

7)PMMA augmentation of Femoral necks. Diulus C, Kayanja M, **Lieberman IH**, Funding = Minimally Invasive Surgery Center & Research Programs Committee, the Cleveland Clinic Foundation (\$22,641)

8)Minimally Invasive Surgical Navigation and Simulation. **Lieberman IH**, Steiner CP, Hahn J. Funding = United States Army Medical Research Acquisition Activity, TATRC. Contract # W81XWH-05-1-0564. Term = August 2005 – September 2007. (\$2,716,260.00)

9) Minimally Invasive Surgical Navigation and Simulation (amendment and modification). **Lieberman IH**, Funding = United States Army Medical Research Acquisition Activity, TATRC. Contract # W81XWH-05-1-0564. Term = August 2005 – February 2008. (\$1,761,638.00)

10) Novel Percutaneous Lumbar Fixation Method. St Clair S, Kayanja M, **Lieberman IH**, Funding = Center Surgical Innovation Technology and Research (Csite) & Research Programs Committee (RPC), the Cleveland Clinic Foundation (\$24,500)

11) Biomechanical comparison of transacral fixation vs anterior column support in lumbosacral fusion; Gwinn D, Lieberman IH, Funding = Max Lieberman Spine Research Fund & Research Programs Committee (RPC), the Cleveland Clinic Foundation (\$24,500)

## Research Funding - Non Peer Reviewed

Endoscopic techniques for spinal surgery. **Lieberman IH**, Salo PT, Litwin D: Linvatech Zimmer Corporation (\$10,000 1994 - 1994)

Randomized trial of endoscopic spinal fusion versus back specific exercise therapy for degenerative disc disease. **Lieberman IH**, Salo PT, Litwin D, Kraetschmer B, Wright J: Smith and Nephew Richards Inc (\$15,000 1994 - 1995)

Pullout and failure mode of new USS pedicle hook and endplate screw. **Lieberman IH**, Woodside T: Synthes Canada Incorporated (\$2,500 1994 - 1994)

Spinal surgery database; CANBAK study. **Lieberman I.H.**, Salo P.T. Kraetschmer B: Smith and Nephew Spine (\$5,000 1995 - 1996)

Endoscopic Instrumentation for the thoracic spine. **Lieberman IH**: Stryker/Osteonics Corporation (\$2,400 1996)

Shared Decision Making in Low Back Pain. **Lieberman IH**, Salo PT, Deber R, Kraetschmer N, Kraetschmer B,: Orthopaedic Acad. Enrich. Fund, Smith & Nephew Endowment (\$15,000 1997 - 1997)

A prospective randomized trial of endoscopic spinal fusion or back specific exercise in the treatment of degenerative spine disease. **Lieberman IH.**, Salo PT. Litwin D. Wright J. Kraetschmer B: Spine Tech Inc. Minneapolis, Minnesota (\$118,000 1996 - 1998)

A prospective randomized trial of Kyphoplasty versus non-operative treatment in osteoporotic vertebral compression fractures. Multi-center post market study, (Garfin S. Yuan H. Kostuik J.) **Lieberman IH**, Bell G. Kyphon Inc.(\$5000 1999)

Biomechanical analysis of a new Femoral Ring Allograft Spacer with interlocking screws. **Lieberman IH**, McLain R, Kuzhupilly R, Synthes Spine(1999)

A randomized clinical trial of two interbody fusion cages; SAC vs BAK. McLain R, **Lieberman IH**, Stryker Osteonics Spine (1999)

## **Research Endeavors - Not Funded**

Complications in spinal surgery: A retrospective chart review 1983-1993. **Lieberman IH**, Orr D, Wai E.

Shared decision-making in spinal surgery. **Lieberman IH**, Salo PT, Deber R, Kraetschmer N.

Pullout and failure mode of new anterior spinal fixation system. **Lieberman IH**, Woodside T.

Vertebral body failure after transpedicular PMMA augmentation. **Lieberman I.H.**, Lewis S.

Three dimensional MRI evaluation of disc herniations. **Lieberman IH**, Kiriakopolis E, Miklus D.

A prospective outcome study using the Oswestry Disability Index and the SF-36 Health Survey in the treatment of Spinal Stenosis. **Lieberman IH**, Asante D, Bhatia C, Kraetschmer BG.

A prospective analysis of Anterior Cervical Discectomy and Fusion using the Modified ODI and the SF-36 outcome instruments. **Lieberman IH**, Yee A, Bhatia C, Kraetschmer BG.

An efficacy study of a new Balloon Bone Tamp in the Treatment of Osteoporotic Vertebral Compression Fractures. **Lieberman IH**, Dudeney MS, Bell G.

Utility of Continuous EMG during Endoscopic Lumbar fusions. **Lieberman IH**, McLain R, Kuzhupilly R, Nair D, Najm I.

3D CT Scanning Reconstructions for Pre-operative Planning in Scoliosis & Thoracoplasty Surgery. **Lieberman IH**, Kuzhupilly R, Davros W.

Adjacent level vertebral body failure after vertebral augmentation: a biomechanical study. Schlenk R, Kayanja M, Ferrara L, **Lieberman IH**.

Biomechanical comparison of transarticular screws to lateral mass plates in two level instrumentations of the cervical spine. DalCanto R, **Lieberman IH**.

Biomechanical characteristics of hybrid hook-screw constructs in short-segment thoracic fixation. Jones A, Kayanja M, Milks R, **Lieberman IH**.

Trans-sacral L5S1 axial rod fixation in osteoporotic bone. Pateder D, Klineberg E, Kayanja M, **Lieberman IH**.

## **COLABORATIVE FELLOWSHIP/RESEARCH PROGRAM SUPPORT**

1)Synthes Spine, AO/ASIF spinal fellowship sponsor (\$45,000 US per year).  
1995, 1996, 1997, 1998, 1999, 2000, 2001.

2)SulzerMedica/Spinetech, spinal fellowship sponsor (\$50,000 US per year).  
1999, 2000, 2001.

3) Orthovita Inc, Spine research lab sponsor (\$25,000 US per year). 2004/05/06/07/08

4) Kyphon Inc, Spine research lab sponsor (\$25,000 US per year). 2004/05/06/07

5) Medtronic Inc, Spine research lab sponsor (\$25,000 US per year). 2005/06/07/08/09

6) Baxano Inc, Spinal fellowship sponsor (\$50,000 US per year). 2009