

### **Curriculum Vitae**

**Douglas S. Musgrave, M.D.**  
Rebound Orthopedics  
Northwest Surgical Specialists, P.C.  
200 NE Mother Joseph Place, Suite 210  
Vancouver, WA 98664  
360-254-6161 (office)

#### **Professional Positions**

2004-present	Orthopedic Hand Surgeon	Rebound Orthopedics and Neurosurgery Vancouver, WA and Portland, OR
2003-2004	Fellow	The Indiana Hand Center Indianapolis, IN
1998-2003:	Resident	Department of Orthopaedic Surgery University of Pittsburgh Medical Center Pittsburgh, PA
1997-1998:	Intern	Department of Orthopaedic Surgery University of Pittsburgh Medical Center Pittsburgh, PA

#### **Education**

1993-1997:	Medical School: Degree:	Duke University School of Medicine M.D. (AOA)
1990-1993:	Undergraduate: Degree:	University of Oregon Bachelor of Science, <i>Summa Cum Laude</i> , valedictorian
1989-1990	Undergraduate: Degree Program:	University of Michigan School of Engineering

#### **Board of Directors and Committee Positions**

Southwest Washington Surgery Center, Board of Directors, 2006-2007, 2012-present  
Vice President, Rebound Orthopedics and Neurosurgery, 2008-2016  
Washington State Orthopedic Association, Board of Directors, 2009-2015

#### **Selected Awards and Honors**

**Patients' Choice Award**, 2019  
**Top Orthopedic Surgeon**, *Washington Magazine*, 2019  
**Portland's Best Doctors**, Hand Surgery, *Portland Monthly Magazine*, 2017  
**Portland's Best Doctors**, Hand Surgery, *Portland Monthly Magazine*, 2016  
**Patients' Choice Award**, 2016  
**On-Time Doctor Award**, 2016  
**Top 10 Doctor Award**, 2014  
**Portland's Best Doctors**, Hand Surgery, *Portland Monthly Magazine*, 2012  
**Patients' Choice Award**, 2012  
**Patients' Choice Award**, 2011  
**Patients' Choice Award**, 2010  
**Patients' Choice Award**, 2009

## **Patients' Choice Award, 2008**

### Residency

**AOA-Zimmer Travel Award**, for paper "Human muscle derived cells in *ex vivo* gene therapy to deliver BMP-2 and produce bone" presented at the 113<sup>th</sup> Annual Meeting of the American Orthopaedic Association, Hot Springs, VA, June 14-17, 2000

**Orthopaedic Trauma Association Best Poster Award** for poster "Human muscle derived cells in *ex vivo* gene therapy to deliver BMP-2 and produce bone" presented 15<sup>th</sup> Annual Meeting of the Orthopaedic Trauma Association, Charlotte, NC, October 22-24, 1999.

**AOA-Zimmer Travel Award**, for paper "Adenovirus-mediated direct gene therapy with BMP-2 produces bone" presented at the 112<sup>th</sup> Annual Meeting of the American Orthopaedic Association, Sun Valley, ID, June 5-8, 1999.

**Residents' Research Day Award**, for presentation "*Ex vivo* gene therapy to produce bone using different cell types." University of Pittsburgh Medical Center Department of Orthopaedic Surgery (Judge: Dr. James R. Urbaniak), April 7, 1999.

### Medical School

**Hewlett Packard Award**, 1997

**Alpha Omega Alpha National Board of Directors** student member (elected to a 3-year term), 1996-1999

**Alpha Omega Alpha National Honor Medical Society** member (inducted as a junior), 1996

**Alpha Omega Alpha National Honor Medical Society Student Research Fellowship**, 1996

**William G. Anlyan Senior Merit Scholarship**, Duke University School of Medicine, 1996

**Duke Medical Alumni Council class of 1997 student representative** (elected to a 2-year term), 1995-1997

### College

**Valedictorian address**, University of Oregon, 1993

**Summa Cum Laude**, University of Oregon, 1993

**Phi Beta Kappa National Honor Society** member, 1993

**W. & Marjorie Shearon Scholarship**, University of Oregon, 1993

**Centurion Award** winner, University of Oregon, 1992

**Junior Award** winner, University of Oregon, 1992

**Centurion Award** winner, University of Oregon, 1991

**Dean's List**, University of Michigan and University of Oregon, every term 1989-1993

### Publications

1. **Musgrave DS**, Idler RS. Volar fixation of dorsally displaced distal radius fractures using the 2.4 mm locking compression plates. *J Hand Surg (Am)*, 743-749; 2005.
2. Kirchner J, Musgrave AL, **Musgrave DS**. Managing chronic pain after ankle sprain. *The Journal of Musculoskeletal Medicine*, 407-416, 2005.
3. Vardakas DG, **Musgrave DS**, Goebel F, Sotereanos DG. A large recurrent giant cell tumor of the hand treated with resection and radiation therapy: a case report. *The American Journal of Orthopedics*, 137-140; 2004.
4. **Musgrave DS**, Sotereanos DG. Tenosynovitis: Trigger finger, de Quervain's disease, and epicondylitis. In Trumble TE (ed) *Hand Surgery Update, 3<sup>rd</sup> Edition*. American Society for Surgery of the Hand, 271-274; 2003

5. **Musgrave DS**, Rodosky MW. Arthroscopic treatment of peri-glenoid cysts. In Ticker JB, Fu FH, Imhoff AB (Eds.) *An Atlas of Arthroscopic Shoulder Surgery*, 2003.
6. **Musgrave DS**, Mendelson SA. Pediatric orthopaedic trauma: principles in management. *Crit Care Med* 30(11) Supp.: S431-S443; 2002.
7. Lee JY, Peng H, Usas A, **Musgrave DS**, Cummins J, Pelinkovic D, Jankowski R, Ziran B, Robbins P, Huard J. Enhancement of bone healing based on ex vivo gene Therapy using human muscle-derived cells expressing bone morphogenetic protein-2. *Human Gene Therapy* 13(10): 1201-1211; 2002.
8. Lee C, Martinek V, Usas A, **Musgrave DS**, Pickvance EA, Robbins PD, Moreland MS, Fu FH, Huard J. Muscle based gene therapy and tissue engineering treatment of growth plate injuries. *Journal of Pediatric Orthopaedics* 22:565-572; 2002
9. **Musgrave DS**, Fu FH, Huard J. Gene therapy and tissue engineering in orthopaedic surgery. *Journal of the American Academy of Orthopaedic Surgeons*, 10(1):6-15; 2002.
10. **Musgrave DS**, Pruchnic R, Bosch P, Whalen J, Ziran BH, Huard J. Human skeletal muscle cells in *ex vivo* gene therapy to deliver BMP-2. *Journal of Bone and Joint Surgery* 84-B:120-127; 2002.
11. Lee JY, **Musgrave DS**, Pelinkovic D, Fukushima K, Cummins J, Usas A, Robbins PD, Fu FH, Huard J. Effect of bone morphogenetic protein-2-expressing muscle-derived cells on healing of critical sized bone defects in mice. *Journal of Bone and Joint Surgery, American Volume* 83-A:1032-1039; 2001.
12. **Musgrave DS**, Pruchnic R, Wright V, Bosch P, Ghivizzani SC, Robbins PD, Huard J. The effect of BMP-2 expression on the early fate of skeletal muscle derived cells. *Bone* 28(5): 499-506; 2001.
13. **Musgrave DS**, Rodosky MW. SLAP lesions: current concepts. *The American Journal of Orthopedics* 30(1): 29-38; 2001.
14. **Musgrave DS**, Vogt MT, Wolfe S, Nevitt MC, Cauley JA. Estrogen replacement therapy and back pain in elderly women. *Spine* 26(14): 1606-1612; 2001.
15. Goebel F, **Musgrave DS**, Vardakas DG, Vogt MT, Sotereanos DG. Minimal medial epicondylectomy and decompression for the treatment of refractory cubital tunnel syndrome. *Clinical Orthopaedics and Related Research* 393:228-236; 2001.
16. Yaghoubian R, Goebel F, **Musgrave DS**, Sotereanos DG. Diagnosis and management of acute fracture-dislocation of the carpus. *Orthopaedic Clinics of North America* 32(2):295-305; 2001.
17. Vardakas DG, **Musgrave DS**, Varitimidis SE, Goebel F, Sotereanos DG. Partial rupture of distal biceps tendon. *Journal of Shoulder and Elbow Surgery* 10(4): 377-379; 2001.
18. Goebel F, **Musgrave DS**, Vardakas DG, Vogt MT, Sotereanos DG. Revision cubital tunnel surgery: treatment based on pathology. *Pittsburgh Orthopaedic Journal* 12: 90-96; 2001.
19. **Musgrave DS**, Bosch P, Lee JY, Whalen J, Pelinkovic D, Ghivizzani S, Niyibizi C,

- Huard J. Ex vivo gene therapy to produce bone using different cell types. *Clinical Orthopaedics and Related Research* 378: 290-305; 2000.
20. **Musgrave DS**, Ziran B. Monoarticular acromioclavicular gout: a case report. *The American Journal of Orthopaedics* 29(7): 544-7; 2000.
  21. **Musgrave DS**, Day CS, Bosch P, Menetrey J, Kasemkijwattana C, Moreland MS, Fu FH, Huard J. Muscle-based tissue engineering for orthopaedic applications. In eds. Huard J, Fu F: *Gene Therapy in Orthopaedics and Sports Medicine*. Birkhauser, pp. 196-212, 2000.
  22. Bosch P, **Musgrave DS**, Shuler F, Ghivizzani SC, Robbins PD, Evans C, Huard J. Osteoprogenitor cells in skeletal muscle. *J Orthop Res* 18: 933-944; 2000.
  23. Glisson RR, **Musgrave DS**, Graham RD, Vail TP: Validity of photoelastic strain measurement on cadaveric proximal femora. *The Journal of Biomechanical Engineering* 122: 423-429; 2000.
  24. Bosch P, **Musgrave DS**, Ghivizzani SC, Robbins PD, Latterman C, Day CS, Huard J. The efficiency of muscle-derived cell-mediated bone formation. *Cell Transplantation* 9: 463-70; 2000.
  25. **Musgrave DS**, Bosch P, Ghivizzani SC, Robbins PD, Evans CH, Huard J. Adenovirus-mediated direct gene therapy with BMP-2 produces bone. *Bone* 24(6): 541-7; 1999.
  26. **Musgrave DS**, Huard J. Skeletal muscle-based tissue engineering for musculoskeletal disorders. *Gene Therapy and Molecular Biology* 3: 207-221; 1999.
  27. **Musgrave DS**, Glisson RR, Graham RD, Guilak F, Vail TP: The effects of coronally slotted femoral prostheses on cortical bone strain. *The Journal of Arthroplasty* 12(5): 1997.

#### **Presentations and Abstracts**

1. **Musgrave DS**. 2.4 mm LCP for dorsally displaced distal radius fractures. Presented at the 20<sup>th</sup> Annual Tri-State Meeting, Indianapolis, IN, May 14, 2004.
2. Lee JY, **Musgrave DS**, Fukushima K, Pelinkovic D, Usas A, Cummins J, Robbins P, Huard J. Use of ex vivo gene therapy and muscle derived cells to heal bone. Presented at the 68<sup>th</sup> Annual Meeting of the American Academy of Orthopaedic Surgeons, San Francisco, CA, February 28-March 4, 2001.
3. Lee JY, Fukushima K, **Musgrave DS**, Pelinkovic D, Usas A, Cummins J, Huard J. Rapid healing of skull defects in mice using ex vivo gene therapy. Presented at the 47<sup>th</sup> Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, February 25-28, 2001.
4. **Musgrave DS**, Bosch P, Pruchnic R, Ghivizzani S, Robbins PD, Lowenstein J, Evans CH, Ziran BH, Huard J. Human muscle derived cells in *ex vivo* gene therapy to deliver BMP-2 and produce bone. Presented at the 15<sup>th</sup> Annual Meeting of the Orthopaedic Trauma Association, Charlotte, NC, October 22-24, 1999. **Best Poster Award at the Orthopaedic Trauma Association**, 1999. Presented at 67<sup>th</sup> Annual Meeting of the American Academy of Orthopaedic Surgeons & the 46<sup>th</sup> Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 12-19, 2000. **AOA-Zimmer Travel Award**, Hot Springs, VA, June 14-17, 2000.

5. **Musgrave DS**, Bosch P, Ghivizzani S, Whalen J, Niyibizi C, Usas A, Huard J. Ex vivo gene therapy to produce bone using different cell types. Presented at the 46<sup>th</sup> Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 12-15, 2000.
6. Calvert JW, **Musgrave DS**, Marra KC, Weiss LE, Huard J. Healing of critical size bony defects with genetically engineered synthetic bone grafts in the rabbit radius model. Presented at the 69<sup>th</sup> Annual Meeting of the American Society of Plastic Surgeons, Los Angeles, CA, 2000.
7. Lee JY, **Musgrave DS**, Pelinkovic D, Usas A, Cummins J, Robbins P, Huard J. Human muscle-derived cells and ex-vivo gene therapy enhance bone healing in mice. Presented at the 33<sup>rd</sup> Annual American Orthopaedic Association Residents' Conference, St. Louis, MO, March 24-27, 2000.
8. Lee C, Martinek V, **Musgrave DS**, Fukushima K, Pelinkovic D, Usas A, Robbins PD, Pickvance E, Fu FH, Huard J. Muscle based gene therapy and tissue engineering for tibial physal defects. Presented at the 46<sup>th</sup> Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 12-15, 2000.
9. Qu Z, Gates C, Bosch P, **Musgrave DS**, Ghivizzani SC, Robbins PD, Huard J. Identification of a population of muscle derived cells capable of highly regenerating skeletal muscle and differentiating into other lineages. Presented at the 46<sup>th</sup> Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 12-15, 2000.
10. Lee C, Fukushima K, Usas A, Lin X, **Musgrave DS**, Pelinkovic D, Martinek V, Somogyi G, Robbins PD, Fu FH, Huard J. Biological interventions based on cell and gene therapy to improve muscle healing following laceration. Presented at the 46<sup>th</sup> Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 12-15, 2000.
11. Lee C, Fukushima K, Usas A, Martinek V, Pelinkovic D, **Musgrave DS**, Lin X, Robbins PD, Fu FH, Huard J. Myoblast mediated gene therapy with muscle as a biological scaffold for the repair of full-thickness defects of articular cartilage. Presented at the 46<sup>th</sup> Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 12-15, 2000.
12. Lee JY, Kimura S, Cummins J, Fukushima K, Pelinkovic D, Usas A, **Musgrave DS**, Huard J. Clonal isolation of pluripotent myoblasts: in vivo differentiation of clonal muscle cells into osteocytic lineage using BMP-2. Presented at the 33<sup>rd</sup> Annual American Orthopaedic Association Residents' Conference, St. Louis, MO, March 24-27, 2000.
13. Lee JY, Qu-Peterson Z, Kimura S, Cummins J, Usas A, Cao B, Jankowski R, Pelinkovic D, Fukushima K, **Musgrave DS**, Robbins PD, Huard J. Enhancement of muscle regeneration and bone healing using muscle derived stem cells. Presented at the Davos Tissue Engineering Workshop, Davos, Switzerland, 2000.
14. **Musgrave DS**, Bosch P, Ghivizzani S, Robbins PD, Evans CH, Huard J. Adenovirus-mediated direct gene therapy with BMP-2 produces bone. Presented at the American Orthopaedic Association 32<sup>nd</sup> Annual Residents' Conference, Chapel Hill, NC, March 12-14, 1999 and at the 112<sup>th</sup> Annual Meeting of the American Orthopaedic Association, Sun Valley, ID, June 5-8, 1999. **AOA-Zimmer Travel Award** recipient.

15. **Musgrave DS**, Bosch P, Ghivizzani S, Robbins PD, Huard J. Comparison of cell types in *ex vivo* gene therapy to produce bone. Presented at the 4<sup>th</sup> Annual Congress of the Cell Transplant Society, Montreux, Switzerland, March 21-24, 1999.
16. **Musgrave DS**, Bosch P, Ghivizzani S, Robbins PD, Huard J. Skeletal muscle-based approach to bone healing. Presented at the 4<sup>th</sup> Annual Congress of the Cell Transplant Society, Montreux, Switzerland, March 12-16, 1999.
17. **Musgrave DS**, Bosch P, Ghivizzani S, Robbins PD, Huard J. The use of different cell types in *ex vivo* gene therapy to produce bone. Presented at the 2<sup>nd</sup> Annual Meeting of the American Society of Gene Therapy, Washington, DC, June 9-13, 1999.
18. Bosch P, **Musgrave DS**, Schuler FS, Evans C, Huard J. Osteoprogenitor cells in skeletal muscle. **Runner-up** at the 16<sup>th</sup> Annual Smith & Nephew Residents' conference, Memphis, TN, August, 1998. Presented at the 45<sup>th</sup> Annual Meeting of the Orthopaedic Research Society, Anaheim, CA, February, 1999
19. Day CS, **Musgrave DS**, Lin M, Sotereanos D, Huard J. Healing tendons incorporate muscle tissue. Presented at the American Orthopaedic Association 32<sup>nd</sup> Annual Residents' Conference, Chapel Hill, NC, March 12-14, 1999.
20. Lee JY, **Musgrave DS**, Pelinkovic D, Usas A, Fukushima K, Cummins J, Huard J. Use of *ex vivo* gene therapy with muscle derived cells to heal bone. Presented at the 2nd BioValley Tissue Engineering Symposium, Freiburg, Germany, November 25-27, 1999.
21. Bosch P, **Musgrave DS**, Schuler FS, Menetrey J, Evans CH, Niyibizi C, Huard J. Myoblast-mediated bone formation. Presented at the 2<sup>nd</sup> Bi-Annual Meeting of the Tissue Engineering Society, Orlando, FL, December 4-6, 1998.
22. **Musgrave DS**, Glisson RR, Graham RD, Guilak F, Vail TP: The effects of coronally slotted femoral prostheses on cortical bone strain. Presented at the 43<sup>rd</sup> Annual Meeting of the Orthopaedic Research Society, San Francisco, February 11-13, 1997.
23. **Musgrave DS**, Graham RD, Glisson RR, Seaber AV, Vail TP: The validation of the photoelastic technique applied to cadaveric femora. Presented at the 82<sup>nd</sup> Clinical Congress of the American College of Surgeons, San Francisco, October 9, 1996.

### **Grants**

1. Huard J, et al. The use of muscle cells to improve bone healing. NIH RO1, 2001-2005, (\$1,500,000) (wrote large portion of grant, original co-investigator).
2. **Musgrave DS**, Lee C, Huard J. *Ex vivo* gene therapy to improve bone healing. Albert J. Ferguson Foundation grant, 1999-2001 (\$15,000).
3. Huard J, **Musgrave DS**, Ziran BH. Muscle based gene therapy and tissue engineering to heal bone defects. Pittsburgh Tissue Engineering Initiative, Technology Development Fund, Seed Grant Program, 1999 (\$50,000).
4. **Musgrave DS**. The effects of slotted femoral prostheses on cortical bone strain in the proximal femur. *Alpha Omega Alpha* National Honor Medical Society Student Research Fellowship, 1996 (\$3,000).

### **Invited Faculty Engagements**

1. Anatomy Lab Faculty, Oregon Health Sciences University, 2005-2007
2. Lecturer, Orthopedic Residency Program, Oregon Health Sciences University, 2005
3. Moderator, "Internal Fixation of Large Bones Using Screws and Plates." AO/ASIF Orthopaedic Trauma Basic and Advanced Course, Indianapolis, IN, June 25-26, 2004.
4. Lecturer, "Plating Principles and Functions." AO/ASIF Orthopaedic Trauma Basic and Advanced Course, Indianapolis, IN, June 25-26, 2004.
5. Lab Moderator, "Compression Plating with 4.5 mm LCP." AO/ASIF Orthopaedic Trauma Basic and Advanced Course, Indianapolis, IN, June 25-26, 2004.
6. Instructor, "Metacarpal Fractures." Hand Care 2004 National Meeting, Indianapolis, IN, May 6-8, 2004.
7. Lab Instructor, "Shoulder Anatomy." Hand Care 2004 National Meeting, Indianapolis, IN, May 6-8, 2004.
8. Moderator, Duke History of Medicine Program, Duke Medical Alumni Association, Durham, NC, April, 1996.

#### **Professional Societies, Memberships, and Positions**

American Society for Surgery of the Hand, Fellow  
 American Academy of Orthopedic Surgeons, Fellow  
 Washington State Orthopedic Association  
 Washington State Medical Association  
 Clark County Medical Society  
 Supervising Physician, Rebound Orthopedic Physician's Assistant Program, 2006-2011  
 Legacy Salmon Creek Hospital, Physician Informatics Committee, 2006-2007  
 Resident's Council Class Representative, UPMC Dept. of Orthop., 2000-2002  
 Pennsylvania Orthopaedic Society, 1999-2003  
 Allegheny County Medical Society, 1997-1999  
*Alpha Omega Alpha* Medical Honor Society  
*Alpha Omega Alpha* National Board of Directors, 1996-1999  
 Duke Medical Alumni Council student representative, 1995-1997  
 American Medical Association, 1993-1998  
 North Carolina Medical Society, student member, 1993-1996

#### **Specialty Courses**

Advanced Microsurgery Course, Division of Plastic Surgery, Indiana University, January, 2004  
 Basic Microsurgery Course, Division of Plastic Surgery, Indiana University, April, 2003  
 Advanced Shoulder Arthroscopy Course, AANA, Chicago, IL, April, 2002

#### **Extracurricular Professional Activities**

Editor, *The Pittsburgh Orthopaedic Journal*, Volume 14, 2003  
 Associate Editor, *The Pittsburgh Orthopaedic Journal*, Volume 13, 2002  
 Associate Editor, *The Pittsburgh Orthopaedic Journal*, Volume 12, 2001  
 Duquesne High School Football Team Physician, 1998-2001  
 Grant Reviewer, AirCast Foundation, 1998-2001

#### **American Board of Orthopaedic Surgeons Certification Exam**

Part I (7/19/2002)

Part II (7/28/2006)  
11/2014

**Board Certified**  
**Recertified (expires 12/31/2026)**

**Certificate of Added Qualification in Surgery of the Hand (CAQSH)**

8/4/2007  
11/2014

**CAQSH Issued**  
**Recertified (expires 12/31/2026)**