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Engineering & Scientific Consulting

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Professional Profile

Dr. Ochoa has over 30 years of broad experience in all R&D related areas of medical device new product development and failure analysis. His expertise encompasses design of hand-held and minimally invasive surgical instruments and implantable medical devices, biomechanics, biomaterials, and preclinical regulatory testing strategy. Dr. Ochoa specializes in the major aspects of medical device total product lifecycle: design control, risk management, biocompatibility, verification & validation testing, device retrieval analysis, post market surveillance, recalls, MRI testing of passive and active medical devices, and failure analysis. Dr. Ochoa also consults with clients on intellectual property issues related to strategy, validity, and infringement.

Dr. Ochoa's particular focus is in the mechanics of cardiovascular, ophthalmological, spinal, and orthopaedic devices, medical device durability, wear; kinematics and kinetics of the human body. Dr. Ochoa also evaluates medical device performance using experimental, cadaveric, computational fluid dynamics and finite element analysis. Dr. Ochoa's experience in mechanical metallurgy, fracture, fatigue and wear of medical devices, and mechanical behavior of polymers and coatings have enabled him to investigate and determine the root cause for countless clinical failures of medical devices and the factors affecting their performance.

Prior to joining Exponent, Dr. Ochoa was Chief Technology Officer at Archus Orthopaedics, a privately held medical device start-up company. Before that, he spent 13 years at DePuy Orthopaedics, a division of Johnson & Johnson, in various roles of increasing responsibility within R&D including Vice President of R&D. His activities and responsibilities included new product development; customer needs analysis and support, M&A due diligence and integration, intellectual property analysis, and litigation support. Dr. Ochoa has directed or has had executive oversight of the commercialization of hundreds of Class I, Class II Pre-Market Notification (510(k))-cleared, and Class III Pre-Market Approval (PMA)- approved medical devices.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, Purdue University, 1991

M.S., Mechanical Engineering, Purdue University, 1987

Professional Degree, Mechanical Engineering, Missouri University of Science and Technology, 2005

B.S., Mechanical Engineering, Missouri University of Science and Technology, *cum laude*, 1985

Harvard University Graduate School of Business Administration: Superior New Product Development Executive Program, March 1995

Missouri University of Science and Technology Alumni Achievement Award, 2016

Pi Tau Sigma

Phi Eta Sigma

Distinguished Engineering Alumnus, Purdue University, 2009

Best Scientific Paper, Awarded by the Spine Arthroplasty Society, 2008

Academy of Mechanical and Aerospace Engineers - Missouri University of Science and Technology, 2005

Outstanding Mechanical Engineer, Purdue University, 2002

Clinical Biomechanics Best Paper Award, Awarded by European Society of Biomechanics, 1998

Johnson & Johnson Professional Achievement Award, 1995

Licenses and Certifications

Licensed Professional Mechanical Engineer, California, #36186

Licensed Professional Mechanical Engineer, Massachusetts, #40846

Licensed Professional Mechanical Engineer, New York, #092609

Licensed Professional Engineer, North Carolina, #049456

Licensed Professional Biomedical Engineer, Texas, #118411

Licensed Professional Mechanical Engineer, Washington, #40751

Academic Appointments

Affiliate Associate Professor, University of Washington, Department of Mechanical Engineering, 2006-2018

Prior Experience

Vice President, R&D and Chief Technology Officer, Archus Orthopedics Inc., 2004-2008

Vice President, R&D, DePuy, a Johnson & Johnson Co., 2000-2004

Director, Hip R&D, DePuy, a Johnson & Johnson Co., 1998-2000

Manager, Hip R&D, Johnson & Johnson Professional, 1994-1998

Project/Senior Project Engineer, R&D, Johnson & Johnson Professional, 1991-1994

Research Engineer, Manufacturing Technical Center, Chrysler Corp., 1985-1987

Professional Affiliations

American Society of Mechanical Engineers (member)

ASTM International (member)

Orthopaedic Research Society (member)

North American Spine Society (member)

Society of Hispanic Professional Engineers (member)

ASM International (member)

Association for the Advancement of Medical Instrumentation (AAMI) (member)

Languages

Spanish

Patents

Patent 10,010,426. Crossbar Spinal Prosthesis Having A Modular Design And Systems For Treating Spinal Pathologies, Issued: July 3, 2018 (with M.K. Kuiper, D. Yager, L. Tokish Jr., D.M. Rosler, M.A. Reiley, M.J. Funk, S.L. Rogers, C.R. Ralph, M.T. Charbonneau, R.J. Broman, and T.J. McLeer).

Patent 8,221,461: Crossbar Spinal Prosthesis Having a Modular Design and Systems for Treating Spinal Pathologies, issued July 17, 2012 (with MK Kuiper, David Yager, L Tokish, Jr., DM Rosler, MA Reiley, MJ Funk, SL Rogers, CR Ralph, MT Charbonneau, RJ Broman, and TJ McLeer).

Patents 6,866,685 and 6,660,040: Prosthetic Joints Having Reduced Area Bearing Surfaces and Application Thereof to a Range of Sizes of Prosthetic Joints, issued March 15, 2005 and December 9, 2003 (with F. Chan).

Patent 6,206,929: Bipolar Hip Prosthesis with Locking Head, issued March 27, 2001 (with F. Khalili).

Patent 6,139,584: Proximal Femoral Sleeve for a Revision Hip Prosthesis, issued October, 31, 2000 (with F. Khalili).

Patent 6,019,765: Morsellized Bone Allograft Applicator Device, Issued February 1, 2000 (with T. Thornhill, W.H. Kennefick, and E. Larson).

Patent 5,935,172: Prosthesis With Variable Fit and Strain Distribution, issued August 10, 1999 (with M.J. O'Neil).

Patent 5,871,549: Femoral Stem with Reduced Coefficient of Friction with Respect to Bone Cement, issued February 16, 1999 (with C.M. Jayashankar and F.D. Matthews).

Patents 5,868,747 and 5,716,358: Directional Bone Fixation Device, issued February 9, 1999 and February 10, 1998 (with L.L. Rogers).

Patent 5,871,546: Femoral Component Condyle Design for Knee Prosthesis, issued February 16, 1999 (with D.P. Colleran, S.M. Gabriel, and R.E Sommerich).

Patent 5,609,643: Knee Joint Prostheses, issued March 11, 1997(with D.P. Colleran and R.E. Sommerich).

Publications

Rau A, Lovald ST, Nissman S, McNulty J, Ochoa JA, Baldwinson M. The mechanics of corneal deformation and rupture for penetrating injury in the human eye. *Injury*. 2018;49(2):230-235.

Ochoa, JA, Siskey, RL, Kuehn, CM, and Ciccarelli, L, Medical Device Regulation and Retrieval Analysis. In: Mihalko WM, Lemons J, Greenwald AS, Kurtz S, eds. *Beyond the Implant Retrieval Analysis Methods for Implant Surveillance*. STP 1606. ASTM International, West Conshohocken, PA, 2018:23-38.

Lovald ST, Rau A, Nissman S, et al. Finite element analysis and experimental evaluation of penetrating injury through the cornea. *Journal of the Mechanical Behavior of Biomedical Materials*. 2017;66:104-110

Rau AC, Siskey R, Ochoa JA, Good T. Factors affecting lethal isotherms during cryoablation procedures. *Open Biomed Eng J*. 2016;10(1):62-71.

Farner S, Malkani A, Lau E, Day J, Ochoa J, Ong K. Outcomes and cost of care for patients with distal radius fractures. *Orthopedics* Sep 1 2014; 37(10):e866-878.

Syamal MN, Lovald ST, Ochoa JA, Ghanem T. Comparative finite-element analysis for defect reconstruction with rhomboid flaps. *Otolaryngol Head Neck Surg*. 2014 Sept; 151(1) suppl:138-139.

Ong KL, Auerbach JD, Lau E, Schmier J, Ochoa JA. Perioperative outcomes, complications, and costs associated with lumbar spinal fusion in older patients with spinal stenosis and spondylolisthesis. *Neurosurg Focus* Jun 2014; 36(6):E5.

Sanders AP, Tibbitts IB, Kakarla D, et al. Contact-coupled impact of slender rods: Analysis and experimental validation. *Experimental Mechanics* 2013/08/10 2013:1-12.

Prisco MR, Ochoa JA, Yardimci AM. Predictions of vacuum loss of evacuated vials from initial air leak rates. *J Pharm Sci* Aug 2013; 102(8):2730-2737.

Lovald ST, Topp SG, Ochoa JA, Gaball CW. Biomechanics of the monopedicle skin flap. *Otolaryngol Head Neck Surg*. Dec 2013;149(6):858-864.

Greenspon AJ, Patel J, Lau E, Ochoa JA, Frisch DE, Ho RT, Pavri BB, Kurtz SM. Trends in permanent pacemaker implantation in the United States 1993-2009: Increasing complexity of patients and procedures. *J Am Coll Cardiol* 2012; 59(13s1):E703-E703.

Sjovold SG, Zhu Q, Bowden A, Larson CR, de Bakker PM, Villarraga ML, Ochoa JA, Rosler DM, Cripton PA. Biomechanical evaluation of the Total Facet Arthroplasty System ® (TFAS ®): Loading as compared to a rigid posterior instrumentation system. *Eur Spine J* 2012 Aug; 21(8):1660-1673.

Sanders A, Tibbitts I, Kakarla D, Siskey S, Ochoa J, Ong K, Brannon R. Contact mechanics of impacting slender rods: Measurement and analysis. 2011 SEM Annual Conference on Experimental and Applied Mechanics, Springer New York, pp. 229-236, Uncasville, CT, June 13-16, 2011.

Greenspon AJ, Patel JD, Lau E, et al. 16-year trends in the infection burden for pacemakers and implantable cardioverter-defibrillators in the United States 1993 to 2008. *Journal of the American College of Cardiology* 2011 Aug; 58(10):1001-1006.

Gornet MF, Chan FW, Coleman JC, Murrell B, Nockels RP, Taylor BA, Lanman TH, Ochoa JA. Biomechanical assessment of a PEEK rod system for semi-rigid fixation of lumbar fusion constructs.

Journal of Biomechanical Engineering 2011 Aug; 133(8):081009:1:12.

Greenspon AJ, Patel JD, Lau E, Ochoa JA, Frisch D, Ho RT, Pavri BB, Kurtz SM. Sixteen year trends in the infection burden for pacemakers and implantable cardioverter-defibrillators in the United States: 1993-2008. *Journal of the American College of Cardiology* 2011; 58(10):1001-1006.

Kurtz SM, Lau E, Ochoa JA, Shkolnikov Y, Pavri BB, Ho RT, Frisch D, Greenspon AJ. Implantation trends and patient profiles for pacemakers and implantable cardioverter defibrillators in the United States: 1993-2006. *Pacing and Clinical Electrophysiology* 2010 Jan.

Voronov LI, Havey RM, Rosler DM, Sjøvold SG, Rogers SL, Carandang G, Ochoa JA, Yuan H, Webb S, Patwardhan AG. L5 - S1 segmental kinematics after facet arthroplasty. *SAS Journal* 2009; 3(2).
<http://sasjournal.com/v2/content/15-%E2%80%93s1-segmental-kinematics-after-facet-arthroplasty>.

Phillips FM, Tzermiadianos MN, Voronov LI, Havey RM, Carandang G, Renner SM, Rosler DM, Ochoa JA, Patwardhan AG. Effect of the Total Facet Arthroplasty System after complete laminectomy-facetectomy on the biomechanics of implanted and adjacent segments. *Spine Journal* 2009 Jan; 9(1):96-102.

Bowden AE, Guerin HL, Villarraga ML, Patwardhan A, Ochoa JA. Quality of motion considerations in numerical analysis of motion restoring implants. *Clinical Biomechanics* 2008 Jun; 23(5):536-544.

Niu Q, Chi X, Leu MC, Ochoa J. Image processing, geometric modeling and data management for development of a virtual bone surgery system. *Journal of Computer Aided Surgery* 2008 Jan; 13(1):30-40.

Komistek RD, Kane T, Mahfouz M, Ochoa JA, Dennis DA. Knee mechanics: A review of past and present techniques to determine in vivo loads. *Journal of Biomechanics* 2005 Feb; 38(2):215-228.

Dennis DA, Komistek RD, Ochoa JA, Haas BD, Hammill C. In vivo comparison of hip separation after metal-on-metal or metal-on-polyethylene THA. *Journal of Bone and Joint Surgery* 2002 Oct; 84(10):1836-1841.

Kurtz SM, Srivastav S, Dwyer K, Ochoa J, Brown S. Analysis of the stem-sleeve interface in a modular titanium alloy femoral component for total hip replacement, in functional biomaterials. *Trans Tech Publications, Switzerland*. Katsube N, Soboyejo WO, Sacks M (eds), pp. 41-68, 2001.

Dennis DA, Komistek RD, Northcut EJ, Ochoa JA, Ritchie A. In vivo determination of hip joint separation and the forces generated due to impact loading conditions. *Journal of Biomechanics* 2001 Apr; 34(5):623-629.

Kurtz SM, Ochoa JA, Hovey CB, White CV. Simulation of initial frontside and backside wear rates in a modular acetabular component with multiple screw holes. *Journal of Biomechanics* 1999 Aug; 32(9):967-976.

Kurtz SM, Ochoa JA, White CV, Srivastav S, Cournoyer J. Backside nonconformity and locking restraints affect liner/shell load transfer mechanisms and relative motion in modular acetabular components for total hip replacement. *Journal of Biomechanics* 1998 May; 31:431-437.

Ochoa JA, Sanders AP, Kiesler TW, Heck DA, Toombs JP, Brandt KD, Hillberry BM. In vivo observations of hydraulic stiffening in the canine femoral head. *Journal of Biomechanics Engineering* 1997 Feb; 119:103-108.

Wilson SF, Ochoa JA, Rogers LL, Lancaster RL, Ritchie A. Finite element analysis in the characterization of an absorbable cement restrictor. *Journal of Engineering in Medicine, IMechEng* 1995; 209:163-167.

Ochoa JA, Sanders AP, Heck DA, Hillberry BM. Stiffening of the proximal femur due to intertrabecular fluid and intraosseous pressure. *Journal of Biomechanical Engineering* 1991; 113(3):259-262.

Ochoa JA, Heck DA, Hillberry BM. The effect of intertrabecular fluid on femoral head mechanics. *Journal of Rheumatology* 1991; 18(4):580-584.

Scientific Exhibits

Mahfouz MR, Anderle M, Bajares G, Pérez Oliva A, Tokish LJ, Ochoa JA, Komistek RD, Zingde S. In vivo kinematics of the Total Facet Arthroplasty System (TFAS). 75th AAOS Scientific Exhibit SE61, Orlando, FL, San Francisco, CA, March 2008.

Dennis DA, Komistek RD, Northcut EJ, Kane TR, Rullkoetter PJ, Ochoa JA, Stiehl JB, Hammill CD, Walker SA. Determination of in vivo Total Hip Arthroplasty (THA) kinematics, kinetics and stresses using fluoroscopy and mathematical modeling. 67th AAOS Scientific Exhibit, Orlando, FL, March 2000.

Northcut EJ, Komistek RD, Dennis DA, Ochoa JA, Ritchie A. Impulse loading exhibited at the implanted hip during active joint separation. 66th AAOS Scientific Exhibit, Anaheim, CA, February 1999.

Komistek RD, Dennis DA, Northcut EJ, Ochoa JA, Ritchie A. In vivo determination of hip joint separation and the forces generated due to impact loading conditions. AAOS Scientific Exhibit, New Orleans, LA, March 1998.

Conference Papers and Abstracts

Briant P, Kreuzer S, Ochoa JA. The ABAQUS living heart: comparison to static and dynamic in-vivo measurements, VVS2016-8001, ASME Verification and Validation Symposium, p. 49, Las Vegas, NV, May 19, 2016.

Lovald ST, Rau A, Nissman S, Ames N, McNulty J, Ochoa JA, Baldwinson M. Finite element analysis of penetrating injury to the human eye. 2016 BMES/FDA Frontiers in Medical Device Conference, Innovations in Modeling and Simulation: Patient-Centered Healthcare, Washington, DC, May 23, 2016.

Lovald ST, Rau A, Nissman S, Ames N, McNulty J, Ochoa JA, Baldwinson M. Finite element analysis of penetrating injury to the human eye. *Ann Biomed Eng* (2016). doi:10.1007/s10439-016-1710-7.

Lovald ST, Rau A, Nissman S, Ames N, Ochoa J, McNulty J, Baldwinson M. Finite element analysis of penetrating injury to the human eye. 2016 Association for Research and Vision in Ophthalmology Annual Meeting, 2399-A0128, Seattle, WA, May 2, 2016

Rau A, Lovald ST, Nissman S, Ames N, Ochoa J, McNulty J, Baldwinson M. The Mechanics of Corneal Deformation and Rupture for Penetrating Injury in the Human Eye. 2016 Association for Research and Vision in Ophthalmology Annual Meeting, 2384-A0013, Seattle, WA, May 2, 2016.

Garcia M, Day J, Rau A, Ochoa J, Lovald ST. Finite Element Analysis of Whole Globe Goldmann Applanation Tonometry: A Closer Look at Mechanics. 2016 Association for Research and Vision in Ophthalmology Annual Meeting, 6458-D0178, Seattle, WA, May 5, 2016.

Lovald ST, Rau A, Nissman S, Ames N, Ochoa J, McNulty J, Baldwinson M. Finite Element Analysis of Penetrating Injury to the Human Eye. Accepted for presentation at the 2016 Association for Research and Vision in Ophthalmology Annual Meeting, Seattle, WA, May 1-5, 2016.

Rau A, Lovald ST, Nissman S, Ames N, Ochoa J, McNulty J, Baldwinson M. The Mechanics of Corneal Deformation and Rupture for Penetrating Injury in the Human Eye. Accepted for presentation at the 2016

Association for Research and Vision in Ophthalmology Annual Meeting, Seattle, WA, May 1-5, 2016.

Garcia M, Day J, Rau A, Ochoa J, Lovald ST. Finite Element Analysis of Whole Globe Goldmann Applanation Tonometry: A Closer Look at Mechanics. Accepted for presentation at the 2016 Association for Research and Vision in Ophthalmology Annual Meeting, Seattle, WA, May 1-5, 2016.

Syamal MN, Lovald ST, Ochoa JA, Gaball CW, Ghanem T. Comparative finite-element analysis for defect reconstruction with local flaps. Triological Society Combined Sections Meeting, Miami Beach, FL, January 10-12, 2014.

Syamal MN, Lovald SL, Ochoa JA, Ghanem TA. Comparative finite-element analysis for defect reconstruction with rhomboid flaps, SP108, AAO-HNSF Annual Meeting, Orlando, FL, September 21-24, 2014.

Farner S, Malkani AL, Lau E, Day J, Ochoa JA, Ong K. Treatment patterns, outcomes, and cost of care for distal radius fracture patients in the Medicare population. Paper No. 606, 80th Annual Meeting of the American Academy of Orthopaedic Surgeons, Chicago, IL, March 19-23, 2013.

Syamal MN, Lovald ST, Ochoa JA, Gaball CW. Comparative finite element analysis for defect reconstruction with local flaps. The Triological Society 2014 Combined Sections Meeting, Miami Beach, FL, January 10-12, 2014. Middle Section Joseph Ogura, MD - Research Award.

Patel J, Ong K, Watson W, Kuehn C, Ochoa JA. Trends in revascularization and mortality for BMS and DES coronary stenting procedures: A Medicare study of 156,300 patients. Poster No. 659, Transcatheter Cardiovascular Therapeutics (TCT) Conference, Miami, FL, October 22-26, 2012.

Patel J, Ong K, Watson W, Helmus M, Kuehn C, Ochoa JA. Historical trends in outcomes following aortic and mitral heart valve replacement procedures: A population-based study of 29,582 Medicare patients from 1997 to 2009. Poster No. 877 (Top 25 Poster), Transcatheter Cardiovascular Therapeutics (TCT) Conference, Miami, FL, October 22-26, 2012.

Auerbach JD, Ong KL, Lau E, Ochoa JA, Schmier J, Zigler JD. Perioperative outcomes, complications, and costs associated with lumbar spinal fusion in older patients with spinal stenosis and spondylolisthesis: Analysis of the United States Medicare claims database. NASS 27th Annual Meeting, Dallas, TX, October 24-27, 2012.

Auerbach JD, Ong KL, Lau E, Ochoa JA, Schmier J, Zigler JD. Cost-effectiveness of interlaminar stabilization compared with instrumented posterior spinal fusion for spinal stenosis and spondylolisthesis. NASS 27th Annual Meeting, Dallas, TX, October 24-27, 2012.

Kuehn CM, Watson H, Ong KL, Mohamed M, Ochoa JA, Fryzek J. Descriptive epidemiology of medical device use among patients with breast, lung or prostate cancer in the national inpatient sample. ISPE's 28th ICPE: International Conference on Pharmacoepidemiology & Therapeutic Risk Management, Barcelona, Spain, August 22-26, 2012.

Auerbach JD, Ong KL, Lau E, Ochoa J, Schmier JK, Zigler JD. Perioperative outcomes, complications, and costs associated with lumbar spinal fusion in older patients with spinal stenosis and spondylolisthesis: analysis of the United States Medicare claims database. International Society of Pharmacoeconomics and Outcomes Research 17th Annual International Meeting, Washington, DC, June 2-6, 2012.

Ong KL, Patel JP, Watson H, Helmus M, Kuehn CM, Ochoa JA. Historical trends in outcomes following aortic and mitral heart valve replacement procedures: A population-based study of 29,582 Medicare patients from 1997 to 2009. Presentation No. P20, Quality of Care and Outcomes Research in Cardiovascular Disease and Stroke (QCOR), Atlanta, GA, May 9-11, 2012.

Auerbach JD, Ong KL, Lau E, Ochoa J, Schmier J, Zigler JD. Perioperative outcomes, complications, and costs associated with lumbar spinal fusion in older patients with spinal stenosis and spondylolisthesis: Analysis of the United States Medicare claims database. Paper No. 516, International Society for the Advancement of Spine Surgery, Barcelona, Spain, March 20-23, 2012.

Ong K, Patel J, Watson H, Helmus M, Kuehn CM, Ochoa JA. Historical trends in outcomes following aortic and mitral heart valve replacement procedures: A population-based study of 29,582 Medicare patients from 1997 to 2009. 4th Annual Joint Scientific Session of the Heart Valve Society of America and Society for Heart Valve Disease, Valves in the Heart of the Big Apple VII: Evaluation & Management of Valvular Heart Diseases, New York, NY, April 12-14, 2012.

Ong K, Watson H, Patel JD, Kuehn CM, Ochoa JA. Population-based analysis of the epidemiology and reintervention rates of cardiovascular stenting procedures: A Medicare study. TCT 23rd Annual Scientific Symposium, San Francisco, CA, November 7-11, 2011.

Hanzlik JA, Patel JD, Kurtz SM, Horn QC, Shkolnikov YP, Ochoa JA, Pavri BB, Greenspon AJ. Why are implantable cardioverter-defibrillators and pacemakers being revised today? MPMD 2011 - Fatigue Life and Durability of Medical Devices Session I, Minneapolis, MN, August 8-10, 2011.

Kakarla D, Sanders AP, Siskey S, Ong K, Ames N, Ochoa JA, Brannon RM. Poster No. 2076. Modeling, testing, and analysis of impulse response of femoral head reduction in ceramic hip prostheses. 58th Annual Meeting Orthopaedic Research Society, P-2076, San Francisco, CA, February 4-7, 2012.

Ong, KL, Auerbach, JD, Lau E, Ochoa JA, Schmier J, Zigler JD. Perioperative outcomes, complications, and costs associated with lumbar spinal fusion in older patients with spinal stenosis and spondylolisthesis: Analysis of the United States Medicare claims database. ISASS 12, No. A-425-0000-00516, Barcelona, Spain, March 20-23, 2012.

Hanzlik J, Patel J, Ochoa JA, Pavri B, Greenspon A, Kurtz S. Retrieval analysis of implantable pacemakers and cardioverter-defibrillators. Biomedical Engineering Society, 2011 Annual Meeting, Hartford, CT, October 12-15, 2011.

Ong KL, Watson H, Patel JD, Kuehn CM, Ochoa JA. Bare-metal and drug-eluting coronary and peripheral vascular stent procedures: Utilization in the U.S. 3rd North American Congress of Epidemiology, Montreal, Quebec, Canada, June 21-24, 2011.

Sanders AP, Tibbitts IB, Kakarla D, Siskey SD, Ochoa JA, Ong KL, Brannon RM. Contact mechanics of impacting slender rods: Measurement and analysis. Paper No. 274, Society for Experimental Mechanics Annual Conference & Exposition on Experimental and Applied Mechanics, Uncasville, CT, June 13-16, 2011.

Ong KL, Lau E, Patel JD, Ochoa JA. Epidemiology of heart valve repair and replacement procedures in the United States: A 15-year perspective. American Heart Association Quality of Care and Outcomes Research in Cardiovascular Disease and Stroke (QCOR), Washington, D.C., May 12-14, 2011.

Ong KL, Watson H, Patel JD, Kuehn CM, Ochoa JA. Bare-metal and drug-eluting coronary and peripheral vascular stent procedures: Utilization in the United States. American Heart Association Quality of Care and Outcomes Research in Cardiovascular Disease and Stroke (QCOR), Washington, D.C., May 12-14, 2011.

Hanzlik, J, Patel JD, Kurtz SM, Pavri BB, Greenspon AJ, Ochoa JA. Insights into cardiac pacemaker and defibrillator revision/upgrades. 37th Annual Northeast Bioengineering Conference, Rensselaer Polytechnic Institute, Troy, NY, April 1-3, 2011.

Patel JD, Kurtz SM, Lau E, Ochoa JA, Pavri BB, Ho R, Frisch DA, Greenspon AJ. Comparison of pacemaker versus ICD infection burden in the United States from 1993-2008. Paper No. AB21-1, Transactions of the 32nd Annual Scientific Sessions of the Heart Rhythm Society, San Francisco, CA, May 4-7, 2011.

Ong K, Ianuzzi A, Lau E, Kurtz S, Ochoa J. Epidemiology and in-hospital complications associated with interspinous process decompression device procedures: The initial U.S. experience using national administrative data. 56th Annual Meeting Orthopaedic Research Society, P-428, San Francisco, CA, March 6-9, 2010.

Kurtz SM, Lau E, Ochoa JA, Shkolnikov Y, Pavri BB, Ho RT, Frisch D, Greenspon AJ. Projections of pacemaker and ICD utilization in the US from 2010 to 2030. Paper No. AB06-5. Transactions of the 31st Annual Scientific Sessions of the Heart Rhythm Society, Denver, CO, May 12-15, 2010.

Kurtz SM, Lau E, Ochoa JA, Pavri BB, Ho RT, Greenspon AJ. Complications and predictors of ICD outcomes. Paper No. AB28-1. Transactions of the 31st Annual Scientific Sessions of the Heart Rhythm Society, Denver, CO, May 12-15, 2010.

Imsdahl SI, Ochoa JA, Ching RP. Kinematics of the lumbar facet joints and vertebral endplate. NW Biomechanics Symposium, ASB Northwest Regional Meeting, Pullman, WA, June 5-6, 2008.

Voronov LI, Havey RM, Rosler DM, Sjovald SG, Rogers SL, Carandang G, Ochoa JA, Patwardhan AG. Kinematics of facet arthroplasty: A comparison of L5-S1 and L3-L4 levels. Annual Meeting of EuroSpine/SpineWeek, Geneva, Switzerland, p. 185, May 26-31, 2008.

Voronov L, Havey R, Rosler D, Sjovald S, Rogers S, Carandang G, Ochoa JA, Patwardhan A. Kinematics of facet arthroplasty: A comparison of L5-S1 and L3-L4 levels. Spine Arthroplasty Summit 8, Miami, FL, May 6-9, 2008. Best Scientific Paper Award.

Havey RM, Voronov LI, Carandang G, Rosler DM, Ochoa JA, Patwardhan AG. Biomechanics of adjacent segments after facet arthroplasty vs. fusion. Spine Arthroplasty Summit 8, p. 185, Miami, FL, May 6-9, 2008.

Bowden AE, Guerin HL, Villarraga ML, Patwardhan AG, Ochoa JA. Higher order validation metrics are required when numerically modeling physiologic motion of the spine. 54th Annual Meeting Orthopaedic Research Society, P-1360, San Francisco, CA, March 2-5, 2008.

Bowden AE, Guerin HL, Villarraga ML, Patwardhan AG, Ochoa JA. Effect of soft tissue mechanical properties on validated quality of motion of the spine. Philadelphia Spine Research Society, Philadelphia, PA, October 9, 2007.

Vadapalli S, Ochoa JA, Rosler DM. Effect of facet arthroplasty on the biomechanics of the lumbar spine — A finite element study. American Society of Biomechanics, 2007 Annual Meeting, P1-9, Stanford, CA, August 22-25, 2007.

Taber BJ, Ochoa JA, Storti D, Ching RP. Characterization of intact lumbar facet kinematics. NW Biomechanics Symposium, ASB Northwest Regional Meeting, Eugene, OR, May 18-19, 2007.

Phillips FM, Voronov LI, Tzermiadianos M, Havey RM, Carandang G, Rosler DM, Ochoa J, Patwardhan AG. Kinematic study of total facet arthroplasty after complete laminectomy-facetectomy. Proceedings, 21st Annual Mtg. of the North American Spine Society, Seattle, WA, September 26-30, 2006. The Spine Journal 2006; 6(5), Suppl. 1:137S.

Phillips FM, Voronov LI, Tzermiadianos M, Havey RM, Carandang G, Rosler DM, Ochoa J, Patwardhan AG. Kinematic study of total facet arthroplasty after complete laminectomy-facetectomy. The 13th

International Meeting on Advanced Spine Techniques, Athens, Greece, July, 2006.

Chi X, Leu MC, Ochoa JA. Modeling of Haptic rendering for virtual bone surgery. 2004 ASME International Mechanical Engineering Congress and R&D Expo and Computers and Information in Engineering Conference, IMECE2004-59814, Anaheim, CA, November 13-19, 2004.

Peng X, Chi X, Ochoa JA, Leu MC. Bone surgery simulation with virtual reality. Proceedings, DETC'03 ASME 2003 Design Engineering Technical Conferences and Computers and Information in Engineering Conference, CIE-2003-43. Chicago, IL, September 2-6, 2003.

Aram L, Lehman A, Lewis P, Render T, Ochoa J, Amirouche F, Gonzalez M. Investigation of cementless cup micromotion and stability after total hip arthroplasty. 4th World Congress of Biomechanics, p. 1076, Calgary, Alberta, Canada, August 2002.

Romero F, Amirouche F, Gonzalez M, Render T, Ochoa J. Investigation of stresses between the liner and the acetabular cup in total hip replacement implants. 4th World Congress of Biomechanics, p. 1089, Calgary, Alberta, Canada, August 2002.

Dennis D, Komistek R, Northcut E, Ochoa J, Haas B. In vivo determination of hip joint separation in subjects having either a metal-on-metal or metal-on-polyethylene THA. 68th Annual Meeting American Academy of Orthopaedic Surgeons, San Francisco, CA, March 2001.

Dennis D, Komistek R, Ochoa J, Northcut E, Hamill C. In vivo determination of femoral head loci pathways during gait in subjects having a metal-on-metal or metal-on-polyethylene THA. 47th Annual Meeting Orthopaedic Research Society, San Francisco, CA, March 2001.

Dennis D, Komistek R, Northcut E, Ochoa J, Hamill C. In vivo determination of hip joint separation in subjects having a metal-on-metal or metal-on-polyethylene THA. 47th Annual Meeting Orthopaedic Research Society, San Francisco, CA, March 2001.

Dennis D, Haas B, Komistek R, Walker S, Ochoa J. Correlation of in vivo kinematics of total hip arthroplasty with polyethylene wear retrievals. 10th Annual Meeting of American Association of Hip and Knee Surgeons, Dallas, TX, November 2000.

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Komistek R, Kane T, Dennis D, Ochoa J, Stiehl J. Use of in vivo kinematic fluoroscopy data to determine lower extremity joint loads. European Society of Biomechanics, Dublin, Ireland, August 2000.

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Kurtz SM, Srivastav S, Dwyer K, Ochoa J, Brown S. Analysis of the stem-sleeve interface in a modular titanium alloy femoral component for total hip replacement. ASME 2000 Congress and Exposition, Symposium on Functional Biomaterials, Joint Replacement, Orlando, FL, November 7, 2000.

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Annual Meeting of the American Orthopaedic Association, Hot Springs, VA, June 2000.

Dennis D, Komistek R, Ochoa J, Northcut E. In-vivo determination of hip joint separation in subjects having either a metal-on-metal or metal-on-polyethylene total hip arthroplasty. 113th Annual Meeting of the American Orthopaedic Association, Hot Springs, VA, June 2000.

Ochoa J, Komistek R, Dennis D, Northcut E, Hammill C. In-vivo determination of hip joint separation in subjects having either a metal-on-metal or metal-on-polyethylene total hip arthroplasty. 11th International Conference on Mechanics in Medicine and Biology, Maui, HI, April 2000.

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Northcut EJ, Komistek RD, Dennis DA, Ochoa JA, Ritchie A. Impulse loading exhibited at the implanted hip joint during active joint separation. SICOT, Sydney, Australia, April 1999.

Northcut EJ, Komistek RD, Dennis DA, Ochoa JA. In vivo determination of hip joint separation: The potential creation of impulse loading conditions. SICOT, Sydney, Australia, April 1999.

Northcut EJ, Komistek RD, Dennis DA, Ochoa JA, Ritchie A. Impulse loading exhibited at the implanted hip joint during active joint separation. AAOS Exhibit, 66th Annual Meeting, Anaheim, CA, February 1999.

Kurtz SM, Ochoa JA, Hovey CB, White CV. Frontside vs. backside wear in an acetabular component with multiple screw holes. Transactions of the Orthopaedic Research Society, Vol 24, p. 54, Anaheim, CA, February 1999.

Rullkoetter PJ, Ochoa JA, Hamilton JV, Chen PCY, Colwell CW, Jr, D' Lima DD. Effect of loading rate on UHMWPE contact mechanics. Transactions of the Orthopaedic Research Society, Vol. 24, p. 826, Anaheim, CA, February 1999.

Komistek RD, Dennis DA, Northcut EJ, Ochoa JA, Ritchie A. In vivo determination of normal, constrained and unconstrained THA kinematics. CORS, Hamamatsu City, Japan, 1998.

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Northcut EJ, Komistek RD, Dennis DA, Ochoa JA, Ritchie A. In vivo determination of normal, constrained and unconstrained THA kinematics. European Society Biomech, July 1998. Clinical Biomechanics Best Paper Award.

Komistek RD, Dennis DA, Northcut EJ, Ochoa JA, Ritchie A. In vivo determination of hip joint separation and the forces generated due to impact loading conditions. Transactions of the Orthopaedic Research Society, Vol 23, p. 197, New Orleans, LA, March 1998.

Kurtz SM, Ochoa JA, White C. Liner/shell load transfer mechanisms in a modular acetabular component for total hip replacement. In: Advances in Bioengineering 1997, ASME, pp.303-304, Atlanta, GA, November 1997.

Komistek RD, Dennis DA, Northcut EJ, Ochoa JA, Ritchie A. In vivo determination of hip joint separation and the forces generated due to impact loading conditions. In: The Future of Technology in Arthroplasty.

10th Annual Symposium of ISTA, p. 167, San Diego, CA, September 1997.

Kurtz SM, Ochoa JA, White C, Srivastav S, Cournoyer J. Effect of non-conformity and locking restraints on backside relative motion of a metal-backed acetabular component with a polar fenestration. Transactions of the Orthopaedic Research Society, Vol. 22, p. 312, San Francisco, CA, February 1997.

Cournoyer JR, Ochoa JA, Kurtz SM. Relative motion at the backside of a metal-backed acetabular component under quasi-static and dynamic loading. Transactions of the Orthopaedic Research Society, Vol. 22, p. 839, San Francisco, CA, February 1997.

Gibbon AJ, Hynes D, Wooster A, Ochoa JA. Stem geometry influences early femoral osteolysis in total hip replacement. Prog. British Orthop. Soc., p.23, Aberdeen, Scotland, September 1995.

Ochoa JA, Hillberry BM. Experimental verification of hydraulic stiffening of cancellous bone. Proceedings, 2nd World Congress Biomech., Vol. 2, p.54, Amsterdam, The Netherlands, July 1994.

Ochoa JA, Hillberry BM. Modeling the hydraulic stiffening of cancellous bone. Proceedings, 2nd World Congress Biomech., Vol. 2, p. 236, Amsterdam, The Netherlands, July 1994.

Rogers LL, Wilson SF, Ochoa JA. Design and characterization of an absorbable cement restrictor. Transactions of the Society for Biomaterials, Vol. 19, Birmingham, Al, April 1993.

Luo ZP, Ochoa JA, Hillberry BM. Effects of specimen size on hydraulic stiffening of cancellous bone. Transactions of the Orthopaedic Research Society, Vol. 18, San Francisco, CA, February 1993.

Ochoa JA, Sommerich RE, Zalenski EB. Application of an innovative experimental method to characterize contact mechanics of total joint replacements. Transactions of the Orthopaedic Research Society, Vol 18, San Francisco, CA, February 1993.

Ochoa JA, Hillberry BM. Permeability of bovine cancellous bone. Transactions of the Orthopaedic Research Society, Vol 17, Washington, D.C., February 1992.

Ochoa JA, Hillberry BM. A poroelastic model for the hydraulic stiffening of cancellous bone. Transactions of the Orthopaedic Research Society, Vol 17, Washington, D.C., February 1992.

Ochoa JA, Heck DA, Hillberry BM. Experimental verification of the hydraulic component of stiffness in cancellous bone. Proceedings, World Congress on Med. Phys. and Biomed. Eng., Osaka, Japan, 1991.

Heck DA, Ochoa JA, Kiesler TW, Toombs JP, Brandt KD, Hillberry BM. In-vivo bone hydraulics. Transactions of the Orthopaedic Research Society, Vol. 16, Anaheim, CA, March 1991.

Ochoa JA, Sanders AP, Hillberry BM, Heck DA. Effects of intertrabecular fluid and pressure on the dynamic stiffness of the proximal femur. Advances in Bioengineering 1989, ASME, San Francisco, CA, December 1989.

Ochoa JA, Heck DA, Hillberry BM, Brandt KD. The effect of osseous fluid on the mechanical behavior of femoral heads. Transactions of the 34th Orthopaedic Research Society, Vol. 13, p. 126, Atlanta, GA, February 1988.

Presentations

Ochoa JA. Wearable medical devices: intersection of technology, regulation and hype. Bio2Device Group (B2DG) Member Meeting. Sunnyvale, CA, September 20, 2016.

Ochoa JA. Drug, device and biotechnology diary of an expert — An insider's view on the proper care and

feeding of experts. IADC 2014 Midyear Meeting, La Jolla, CA, February 12, 2014.

Ochoa JA. Medical device regulatory compliance & recalls. life sciences legal summit. American Bar Association, San Francisco, CA, February 27, 2014.

Ochoa JA. Why did FDA refuse more than 58% of 510(k) submissions in 2013? The 10x Medical Device Conference, Minneapolis, MN, May 13, 2014.

Ochoa JA. Biomedical research — Helping others. Keynote Speaker. Emerging Ideas in Biomedical Research (EIBR) Conference, College of Engineering, Brigham Young University, San Provo, UT, October 17, 2013.

Ochoa JA. From start-up to market leader: Lessons learned in the orthopaedic R&D industry. Careers in Biomaterials Engineering-Professional Advancement Series, School of Medicine, Stanford University, San Antonio, TX, January 28, 2013.

Ochoa JA. How to use the design process to manage risk: Elements of design controls and why it matters. Stanford Industry Insights, School of Medicine, Stanford University, Stanford, CA, March 13, 2013.

Ochoa JA. Panelist on anatomy of medical device litigation in today's market. Hot Topics in Medical Device and Pharmaceutical Litigation - Bowman and Brooke, Minneapolis, MN, April 18, 2013.

Ochoa JA. From benchtop to bedside: The role of the (bio) engineer in new product realization. Distinguished Biomedical Engineering Lecture, School of Biomedical Engineering, Purdue University, West Lafayette, IN, February 10, 2012.

Ochoa JA. The role of analysis in medical device NPD. 2010 MD&D Annual Conference & Exhibition, Minneapolis, MN, October 13, 2010. Session Chair: Preclinical Testing of Implantable Medical Devices.

Ochoa JA. Technical fundamentals of R&D and portfolio management: New product realization in medical devices — The whole story. Invited Speaker, 2009 RAPS Annual Conference & Exhibition, Philadelphia, PA, September 14, 2009.

Ochoa JA. Career perspectives in the medical device industry. Penn Biotech Group Seminar, University of Pennsylvania, Philadelphia, PA, September 15, 2009.

Ochoa JA. Values and value-the role of the leader in work and life, 2008 NAE Engineer of 2020 Workshop, Purdue University, September 30, 2008.

Ochoa JA. Panelist on Consulting Agreements with Physicians: The Role of Bias and Compliance at the Philadelphia Medical Device Symposium, Philadelphia, PA, November 12, 2008.

Ochoa JA. Undergraduate research — (Why) does it matter? 4th Annual Undergraduate Research Conference, Key Note Speaker, Missouri University of Science & Technology, Rolla, MO, April 9, 2008.

Ochoa JA. The role of the biomedical engineer in new product realization. BME 390, Professional Seminar, Weldon School of Biomedical Engineering, Purdue University, W. Lafayette, IN, September 21, 2006.

Ochoa JA. Emerging field of biomedical engineering — A mechanical engineer's perspective. ASME District C Student Conference, Missouri University of Science and Technology, Rolla, MO, March 4, 2006.

Ochoa JA. Values based decision-making and its role in value creation. Technology MBA Graduate

Seminar, University of Washington, Seattle, WA, October 16, 2004.

Ochoa JA. From bioengineering to interfacial and scale engineering — Evolution of new engineering disciplines. Graduate Seminar, School of Mechanical Engineering, Missouri University of Science and Technology, October 30, 2003.

Ochoa JA. Panelist on career and leadership development forum. Hispanic Organization for Leadership and Achievement (HOLA) at J&J, New Brunswick, NJ, October 23, 2003.

Ochoa JA. Values and value — The role of the leader in work and life. Society of Hispanic Professional Engineers Eastern Technical Career Conference (SHPE-ETCC '03), Keynote speaker, Washington DC, November 14, 2003.

Ochoa JA. Orthopaedic research — The way forward. Oak Ridge National Laboratory, University of Tennessee Mechanical Engineering Combined seminar, Knoxville, TN, March 13, 2003.

Ochoa JA. Technology and IP management in new product commercialization. Guest Lecture, School of Engineering Management EMgt 320 Technical Entrepreneurship, Missouri University of Science and Technology, Rolla, MO, October 10, 2002.

Ochoa JA. The fruit of orthobiologic research. Faculty of Contemporary Techniques and Issues in Orthopaedics, Whistler, BC, Canada, March 6, 2002.

Ochoa JA. The pitfalls that remain in orthopaedic design in 2001. Contemporary Techniques and Issues in Orthopaedics, Vail, CO, February 12, 2001.

Ochoa JA. The role of design, materials and testing in total joint replacement. Guest Lecture, SAE Fort Wayne Chapter, Fort Wayne, IN, April, 2000.

Ochoa JA. Improved wear using gamma sterilization in a vacuum-foil package and calcium stearate free material. Faculty of the 1st International Symposium on Total Knee Arthroplasty, Chiba University, Tokyo, Japan, May 1997.

Ochoa JA. Mechanisms of failure in THR. Faculty of the 6th Annual Symposium of Arthritis of the Hip and Knee, Vail, CO, March 9, 1996.

Ochoa JA. Proper femoral offset and its impact on THA biomechanics. Faculty at the Total Hip and Knee Replacement Symposium (Italy-US), Marco Island, FL, February 1995.

Ochoa JA. Experimental verification of hydraulic stiffening of cancellous bone. Invited lecture 2nd World Congress of Biomechanics Symposium on Bone Structure and Remodeling, Amsterdam, The Netherlands, July 1994.

Ochoa JA. The effect of intertrabecular fluid on the viscoelasticity of bone. 14th Annual Garceau-Wray Lectures, Indiana University School of Medicine, November 1989.

Ochoa JA. Orthopaedic biomechanics — An introduction. Seminar, School of Electrical Engineering, Purdue University, October 1987.

Ochoa JA. The effect of internal fluid on the viscoelasticity of bone. Design Seminar, School of Mechanical Engineering, Purdue University, November 1987.

Guest Lectures

Chiba University, Tokyo, Japan

Colorado School of Mines, Golden, CO

Indiana University, Bloomington, IN

Missouri University of Science & Technology, Rolla, MO

Purdue University, W. Lafayette, IN

University of Illinois - Chicago, Chicago, IL

University of Pennsylvania, Philadelphia, PA

University of Tennessee, Knoxville, TN

University of Washington, Seattle, WA

Advisory Appointments

Missouri University of Science and Technology, External Advisory Board (EAB), Center for Bone and Tissue Repair and Regeneration (2012-)

Missouri Center of Excellence of the Life Sciences Research Board — Screening Committee: Life Sciences Trust Fund (2008-)

Missouri University of Science and Technology, Industrial Advisory Board, School of Mechanical Engineering (1999 -)

Engineering Advisory Committee, Purdue University Schools of Engineering (2001 -)

Industrial Advisory Board, Purdue University School of Biomedical Engineering (2002 -)

Industrial Advisory Board, University of Tennessee School of Biomedical Engineering (2003 -)

Academy of Mechanical and Aerospace Engineers, School of Mechanical Engineering, Missouri University of Science and Technology (2005 -)

University of Illinois-Chicago, Industrial Advisory Board, School of Mechanical Engineering (2001-2004)

Board of Directors, International Society of Technology in Arthroplasty (ISTA) (2003-2006)

Intelligent Biomedical Devices and Musculoskeletal Systems, NSF-IUCRC- Industrial Advisory Board (Chairman), Denver, CO (1996-2003)