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Professional Profile

Dr. Lovald is an expert in design evaluation, risk analysis, and failure investigation across a range of advanced technologies, including consumer electronics (wearables, VR/AR headsets), medical devices, combination products, and robotics. He provides engineering consultation to clients facing complex technical, regulatory, testing, safety and intellectual property challenges.

Dr. Lovald has particular expertise in investigating the performance and failure of products, devices, and mechanical systems using engineering simulations (nonlinear finite element analysis, computational fluid dynamics, multiphysics) and customized testing. He has published work on humanoid robot safety, drug delivery injection mechanics, spine biomechanics, the optimization of bone fracture fixation, the mechanics of skin flap closures, bioabsorbable and PEEK polymers for new orthopaedic applications, ocular mechanics during tonometry, hemodynamics and mechanics of diseased arteries and aneurysms, as well as a number of health and economics studies from national healthcare databases.

Immediately prior to working at Exponent, Dr. Lovald cofounded a company where he initiated and directed the research, seed funding, design, manufacturing, FDA 510(k) clearance, intellectual property strategy, and post-market study Investigational Review Board approval of a patented mandibular fracture fixation system. He has also worked in the area of clinical research by designing and managing post-market studies which investigated the clinical outcomes of total knee arthroplasty, total hip arthroplasty, atrial fibrillation, knee resurfacing, and spinal degenerative disc disease patients.

Academic Credentials & Professional Honors

Ph.D., Engineering, University of New Mexico, 2008

M.B.A., Business Administration, University of New Mexico, 2006

M.E., Manufacturing Engineering, University of New Mexico, 2006

B.S., Mechanical Engineering, University of New Mexico, 2003

Licenses and Certifications

Professional Engineer Mechanical, California, #37802

Academic Appointments

Visiting Research Assistant Professor, Drexel University, School of Biomedical Engineering, Science and Health Systems, 2011

Prior Experience

Clinical Project Manager II, PhDx Systems

Product Development Engineer, Satyrne Medical, 2006-2010

Research Assistantship - Intramedullary Femoral Nail Failure, University of New Mexico, 2008

Research Assistantship - Stenotic Carotid Blood Flow, University of New Mexico, 2006-2008

Mechanical Engineering Intern, Stryker Leibinger Micro Implants, Summer 2005

Research Fellowship - Craniofacial Trauma Fixation, University of New Mexico, 2003-2006

Mechanical and Biomedical Engineering Independent Consultant, 2003-2010

Professional Affiliations

American Society of Mechanical Engineers

Patents

United States Patent 8,246,663: Osteosynthesis plate, method of customizing same, and method for installing same, published August 21, 2012.

Publications

Lovald, S.T., Gorji, M.B., Chen, M., Pak, N. Developing failure criteria for laceration injury of dermal tissue. Journal of the Mechanical Behavior of Biomedical Materials. 2023, 144, 1-11.

Caraveo, V., Lovald, S., Khraishi, T. A Study of the Mechanical Characteristics of a Mandibular Parasymphyseal Fracture with Internal Fixation Device Subject to Variable Bite Forces: Finite Element Analysis. Journal of Biosciences and Medicines. 2021, 9, 158-178.

Yalmanchili, H., Buchanan, S., Chambers, L., Thorns, J., McKenzie, N., Reiss, A., Page, M, Dizon, V., Brooks, S., Shaffer, L., Lovald, S., Hartranft, T., Price, P. Postlaparotomy pain management: Comparison of patient-controlled analgesia pump alone, with subcutaneous bupivacaine infusion, or with injection of liposomal bupivacaine suspension. Journal of Opioid Management 15:2: 169-175.

Gonzales J, Lovald ST, Lau EC, Ong KL. Risk of Opioid-Related Adverse Events After Primary and Revision Total Knee Arthroplasty. J Surg Orthop Adv 2018 Summer; 27(2):148-154

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 Feb; 49(2): 230-235.

Radcliff K, Ong KL, Lovald S, Lau E, Kurd M. Cervical spine surgery complications and risks in the elderly. Spine 2017 Mar; 42(6):E347-E354.

Gonzales J, Lovald ST, Lau EC, Ong KL. Quantifying the risk of analgesic-related adverse events after knee arthroscopy. J Surg Orthop Adv 2016 Winter; 25(4):215-21.

Lovald ST, Rau A, Nissman S, Ames N, McNulty J, Ochoa JA, Baldwinson M. Finite element analysis and experimental evaluation of penetrating injury through the cornea. J Mech Behav Biomed Mater. 2017 Feb;66:104-110.

Barrington JW, Emerson RH, Lovald ST, Lombardi AV, Berend KR. No Difference in Early Analgesia

Between Liposomal Bupivacaine Injection and Intrathecal Morphine After TKA. Clin Orthop Relat Res. 2017 Jan;475(1):94-105.

Emerson RH, Barrington JW, Olugbode O, Lovald S, Watson H, Ong K. Comparison of Local Infiltration Analgesia to Bupivacaine Wound Infiltration as Part of a Multimodal Pain Program in Total Hip Replacement. J Surg Orthop Adv 2015 Winter; 24(4):235-41.

Lovald ST, Ong KL, Lau EC, Joshi GP, Kurtz SM, Malkani AL. Patient Selection in Short Stay Total Hip Arthroplasty for Medicare Patients. J Arthroplasty. 2015 Dec; 30(12):2086-91.

Lovald ST, Ong KL, Lau EC, Joshi GP, Kurtz SM, Malkani AL. Readmission and Complications for Catheter and Injection Femoral Nerve Block Administration After Total Knee Arthroplasty in the Medicare Population. J Arthroplasty. 2015 Dec; 30(12):2076-81.

Barrington JW, Olugbode O, Lovald S, Ong K, Watson H, Emerson RH Jr. Liposomal bupivacaine: a comparative study of more than 1000 total joint arthroplasty cases. Orthop Clin North Am 2015; 46(4):469-477.

Topp SG, Lovald S, Khraishi T, Gaball CW. Biomechanics of the rhombic transposition flap. Otolaryngol Head Neck Surg. 2014 Dec; 151(6):952-9.

Lovald ST, Ong KL, Malkani AL, Lau EC, Schmier JK, Kurtz SM, Manley MT. Complications, mortality, and costs for outpatient and short-stay total knee arthroplasty patients in comparison to standard-stay patients. J Arthroplasty. 2014 Mar; 29(3):510-5.

Lovald S, Ong K, Lau E, Joshi G, Kurtz S, Malkani A. Patient selection in outpatient and short-stay total knee arthroplasty. J Surg Orthop Adv 2014 Spring; 23(1):2-8.

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.

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Lovald ST, Ong KL, Lau EC, Schmier JK, Bozic KJ, Kurtz SM. Mortality, cost, and health outcomes of total knee arthroplasty in Medicare patients. Journal of Arthroplasty 2013; 28(3):449-454.

Lovald S, Mercer D, Hanson J, Cowgill I, Erdman M, Robinson P, Diamond B. Hardware removal after fracture fixation procedures in the femur. Journal of Trauma and Acute Care Surgery 2012; 72(1):282-287.

Lovald S, Mercer D, Hanson J, Cowgill I, Erdman M, Robinson P, Diamond B. Complications and hardware removal after open reduction and internal fixation of humeral fractures. Journal of Trauma 2011; 70(5):1273-1277.

Kimsal J, Baack B, Candelaria L, Khraishi T, Lovald S. Biomechanical analysis of mandibular angle fractures. Journal of Oral and Maxillofacial Surgery 2011; 69(12):3010-3014.

Hanson J, Lovald S, Cowgill I, Erdman M, Diamond B. National hardware removal rate associated with

internal fixation of facial fractures. Journal of Oral and Maxillofacial Surgery 2011; 69(4):1152-1158.

Gaball C, Lovald S, Baack B, Olson G. Minimally invasive bioabsorbable bone plates for rigid internal fixation of mandible fractures. Archives of Facial Plastic Surgery 2011; 13(1): 31-35.

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Lovald S, Baack B, Gaball C, Olson G, Hoard A. Biomechanical optimization of bone plates used in rigid fixation of mandibular symphysis fractures. Journal of Oral and Maxillofacial Surgery 2010; 68(8):1833-1841.

Lovald S, Khraishi T, DeCoster T, Bozorgnia S. The effect of locking screw threads on the fatigue strength in intramedullary nail fixation of femur fractures. International Journal of Experimental and Computational Biomechanics 2010; 1(3):225-235.

Lovald S, Khraishi T, Wagner J, Baack B. Mechanical design optimization of bioabsorbable fixation devices for bone fractures. Journal of Craniofacial Surgery 2009; 20(2):389-398.

Lovald S, Wagner J, Baack B. Biomechanical optimization of bone plates used in rigid fixation of mandibular fractures. Journal of Oral and Maxillofacial Surgery 2009; 67(5):973-985.

Lovald S, Heinrich J, Khraishi T, Yonas H, Pappu S. The role of fluid dynamics in plaque excavation and rupture in the human carotid bifurcation: A computational study. International Journal of Experimental and Computational Biomechanics 2009; 1:76-95.

Boyd N, Wagner J, Lovald S, Miller T, Baack B, Khraishi T. Clinical and FEA of low-profile 3D and parallel miniplates in fixation of mandibular symphysis and parasymphysis fractures. Journal of Maxillofacial Oral Surgery 2008; 7(4):407-413.

Chaudhary N, Lovald S, Wagner J, Khraishi T, Baack B. Experimental and numerical modeling of screws used for rigid internal fixation of mandibular fractures. Modelling and Simulation in Engineering 2008; Article ID 628120:1-11.

Caraveo V, Lovald S, Khraishi T, Wagner J, Baack B. The effects of frictionless/frictional contact boundary conditions in finite element modeling of mandibular fractures. Multidiscipline Modeling in Materials and Structures 2008; 4(3):227-236.

Lovald S, Khraishi T, Wagner J, Baack B, Wood J. Effect of fracture healing on fixation of a parasymphyseal mandibular fracture: A study using the finite element method. International Journal of Biomedical Engineering and Technology 2007; 1:204-217.

Fox M, Hastings R, Lovald S, Heinrich J. Case study of an aerosol explosion and a method to determine explosion temperatures. Journal of Failure Analysis and Prevention 2007; 7:165-174. Named Best Paper of the Year in 2007 by editorial board.

Lovald S, Khraishi T, Wagner J, Kelly J, Wood J, Baack B. Finite element analysis of screw-plate systems for fixation of parasymphyseal fractures of the mandible. Journal of Mechanics 2007; 23:69-77.

Lovald S, Khraishi T, Wagner J, Kelly J, Wood J, Baack B. Comparison of plate-screw systems used in mandibular fracture reduction: Finite element analysis. Journal of Biomechanical Engineering 2006; 128:654-662.

Lovald S, Smith R, Wagner J. Bringing new dimensions to bone plate design: An innovative use of biomechanical simulation design methodology for the craniomaxillofacial trauma market. BONEZone 2008; 7(1):16-20.

Lovald S, Kennedy K. Gaps in clinical evidence: The case for better data. Orthopaedic Product News, November/December 2009, pp. 36-39.

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Books and Book Chapters

Campbell, I., Lovald, S., Garcia, M., Coudrillier, B. Biomechanical Properties of the Sclera. In: Ocular Rigidity, Biomechanics and Hydrodynamics of the Eye. Springer. 2021

Scott Lovald, Ph.D., Britta Berg-Johansen, Ph.D., Eda Altiok, Ph.D. and Steven M. Kurtz, Ph.D. Polyetheretherketone in Trauma. In: PEEK Biomaterials Handbook. 2nd Ed. Elsevier, 2019.

Britta Berg-Johansen, Ph.D., Scott Lovald, Ph.D., Eda Altiok, Ph.D. and Steven M. Kurtz, Ph.D. Applications of Polyetheretherketone in Arthroscopy. In: PEEK Biomaterials Handbook. 2nd Ed. Elsevier, 2019.

Eda Altiok, Ph.D., Britta Berg-Johansen, Ph.D., Scott Lovald, Ph.D., and Steven M. Kurtz, Ph.D. Applications of Polyetheretherketone in Craniomaxillofacial Surgical Reconstruction. In: PEEK Biomaterials Handbook. 2nd Ed. Elsevier, 2019.

Ong K, Lovald S, Black J. Orthopaedic Biomaterials in Research and Practice, 2nd Ed. CRC Press, 2014.

Lovald S, Kurtz S. Applications of Polyetheretherketone in Trauma, Arthroscopy, and Cranial Defect Repair. In: PEEK Biomaterials Handbook. Elsevier, 2012.

Published Abstracts and Presentations

Lovald, S., Agarwal, S., Loccisano, A., Yen, M., Davis, B. Simulation of large volume, high-viscosity subcutaneous injections with transport and absorption. Presentation at 2025 Parenteral Drug Association Universe of Pre-Filled Syringes and Injection Devices Conference, Vienna, Austria, Oct. 21-22, 2025.

Lovald, S., Clayman, N., Razi, H., Kalyan, S. Stabler, C., Vargas, J., Clevenger, J. Analysis Framework for Wearable Injector Systems to Improve Functionality, Safety and Reliability. Presentation at 2025 Parenteral Drug Association Universe of Pre-Filled Syringes and Injection Devices Conference, Vienna, Austria, Oct. 21-22, 2025.

Lovald, S., Petersen, C., Shannon, D., Elmasry, S., Kreuzer, S. Model Optimization and Uncertainty Estimation of a Lumbar Spine Finite Element Model. Medical Device Innovation Consortium (MDIC) 2025 Computational Modeling & Simulation (CM&S) Symposium. Hyattsville, MD, Nov. 4-6, 2025.

Molnar, J., Easley, S., Campbell, I., Lovald, S. Safety Standards and Risk Evaluation for Physical Human-Robot Interaction, Spotlight Presentation at the Workshop on Public Trust in Autonomous Systems, 2025 IEEE International Conference on Robotics & Automation, Atlanta, GA, May 19, 2025.

Lovald, S., Petersen, C., Berg-Johansen, B. Development of a Generalized Poroelastic Annulus Fibrosus Material Model Including Damage. Orthopaedic Research Society Annual Conference. Phoenix, Arizona, Feb. 7-11, 2025.

Lovald, S., Agarwal, S., Radhakrishnan, A., Yen, M., Rau, A. Computational Modeling of Large Volume, High-Viscosity Subcutaneous Injections. Presentation at 2024 Parenteral Drug Association Universe of

Pre-Filled Syringes and Injection Devices Conference, Phoenix, AZ, Oct. 22-23, 2024.

Lovald, S., Berkey, C., Pak, N., Gorji, M., Rau, A. Finite Element Analysis of Skin Deformation and Puncture for Microneedle Array Design. Presentation at 2023 Parenteral Drug Association Universe of Pre-Filled Syringes and Injection Devices Conference, Gothenburg, Sweden, Oct. 17-18, 2023.

Lovald, S., Agarwal, S., Radhakrishnan, A., Casey, V., Rau, A. Anisotropic and Nonlinear Tissue Permeability Drives Tissue Pressure and Injection Distribution: A Computational Investigation of Subcutaneous Injections. Presentation at 2023 Parenteral Drug Association Universe of Pre-Filled Syringes and Injection Devices Conference, Gothenburg, Sweden, Oct. 17-18, 2023.

Lovald, S., Berkey, C., Pak, N., Gorji, M., Rau, A. Finite Element Analysis of Skin Deformation and Puncture for Full Microneedle Arrays. Presentation at Microneedle & Intradermal Delivery Forum 2023, Philadelphia, PA, Sept. 18-19, 2023.

Lovald, S.T., Gorji, M.B., Chen, M., Pak, N. Computational Modeling of Sharp Edge Injury Hazards. Presented at the IEEE International Symposium on Product Compliance Engineering. Dallas, TX, May 1-3, 2023.

Lovald, S. “Regulatory pathways: Overview of process and required evidence.” Presentation at the 15th Annual International San Francisco Orthopaedic Trauma Course: Sept. 29-Oct. 2, 2021

Lovald ST, Rau A, Nissman S, Ames N, Ochoa J, McNulty J, Baldwinson M. Finite Element Analysis of Penetrating Injury to the Human Eye. Annals of Biomedical Engineering 2016; 44(12): 3719-3749.

Lovald ST, Syamal MN, Ochoa J, Ghanem T, Gaball CW. Finite-Element Analysis of the Rhomboid Skin Flap: Flap Planning and Relaxed Skin Tension Lines. Poster presentation at the BMES/FDA Frontiers in Medical Devices Conference, May 23-25, 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. Podium presentation at the BMES/FDA Frontiers in Medical Devices Conference, May 23-25, 2016.

Lovald ST, Garcia M, Day J, Rau A, Ochoa J. Finite Element Analysis of Whole Globe Goldmann Applanation Tonometry: A Closer Look at Mechanics. Poster presentation at the BMES/FDA Frontiers in Medical Devices Conference, May 23-25, 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. Abstract (Poster) No. 2399-A0128, 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. Abstract (Poster) No. 2384-A0113, 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. Abstract (Poster) No. 6458-D0178, Association for Research and Vision in Ophthalmology Annual Meeting, Seattle, WA, May 1-5, 2016.

Devin C, McGirt M, Lau E, Lovald S, Ong K. PCA use for inpatient posterior lumbar spine fusion: Opioid-related complications and costs. Abstract (Poster) No. A-758-0000-00046, 16th Annual Conference of the International Society for the Advancement of Spine Surgery, Las Vegas, NV, April 6-8, 2016.

Devin C, McGirt M, Lau E, Lovald S, Ong K. PCA use for inpatient posterior lumbar spine fusion: Opioid-related complications and costs. Oral Platform Abstract No. 229, Spine Summit 2016, Orlando, FL, March 16-19, 2016.

Ong KL, Devin C, Lau E, Lovald S, McGirt M. PCA use for inpatient posterior lumbar spine fusion: Opioid-related complications and costs. Poster No. 1721, 62nd Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 5-8, 2016.

Devin C, McGirt M, Lau E, Lovald S, Ong K. PCA use for inpatient posterior lumbar spine fusion: Opioid-related complications and costs. Paper No. 569, 83rd Annual Meeting of the American Academy of Orthopaedic Surgeons, Orlando, FL, March 1-5, 2016.

Hutchinson H, Jaekel D, Lovald S, Watson H, Ong K. Femoral neck fractures treated with hemi-arthroplasty: A study of a multimodal pain management program. Poster No. 0788, 62nd Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 5-8, 2016.

Angel J, Steel C, Ong K, Watson H, Lovald S. Postoperative Pain Control after Total and Reverse Shoulder Arthroplasty: Interscalene Block vs. Liposomal Bupivacaine. Poster No. 2026, 62nd Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 5-8, 2016.

Barrington JW, Lovald S, Ong K, Watson H, Emerson RH. How Do Demographic, Surgical, Patient, and Cultural factors Affect Pain Control after Revision Total Joint Arthroplasty? A Multivariable Regression Analysis. Poster No. 1953, 62nd Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 5-8, 2016.

Barrington JW, Lovald S, Ong K, Watson H, Emerson RH. How Do Demographic, Surgical, Patient, and Cultural factors Affect Pain Control after Total Hip Arthroplasty?. Poster No. 1079, 62nd Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 5-8, 2016.

Barrington JW, Lovald S, Ong K, Watson H, Emerson RH. How Do Demographic, Surgical, Patient, and Cultural factors Affect Pain Control after Primary Total Knee Arthroplasty? A Multivariable Regression Analysis. Poster No. 1952, 62nd Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 5-8, 2016.

Barrington JW, Lovald S, Ong K, Watson H, Emerson RH. How Do Demographic, Surgical, Patient, and Cultural factors Affect Pain Control after Unicompartmental Knee Arthroplasty? A Multivariable Regression Analysis. Poster No. 1087, 62nd Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 5-8, 2016.

Gonzales J, Lovald S, Lau E, Ong K. The risk of opioid-related adverse events after primary and revision total knee arthroplasty. Poster No. 1927, 62nd Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 5-8, 2016.

Gonzales J, Lovald S, Lau E, Ong K. Quantifying the risk of opioid-related adverse events after knee arthroscopy. Poster No. 1813, 62nd Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 5-8, 2016.

Angel J, Steel C, Ong K, Watson H, Lovald S. Pain Control after Total and Reverse Shoulder Arthroplasty: Interscalene Block vs. Liposomal Bupivacaine. Poster No. P315, 83rd Annual Meeting of the American Academy of Orthopaedic Surgeons, Orlando, FL, March 1-5, 2016.

Barrington JW, Lovald S, Ong K, Watson H, Emerson RH. How do demographic, surgical, patient, and cultural factors affect pain control after unicompartmental knee arthroplasty? A multivariable regression analysis. Poster No. 58, 25th Annual Meeting of the American Association of Hip and Knee Surgeons, Dallas, TX, November 5-8, 2015.

Barrington JW, Lovald S, Ong K, Watson H, Emerson RH. The role of gender, age, race, and ethnicity on postoperative pain after primary total knee arthroplasty. Poster No. 83, 25th Annual Meeting of the American Association of Hip and Knee Surgeons, Dallas, TX, November 5-8, 2015.

Lovald ST, Jaekel DJ, Kurtz SM. PEEK bone plate structures for mandibular fracture fixation. Poster presentation. The 2nd International PEEK Meeting. Washington, D.C. 2015.

Kurd M, Ong K, Lovald S, Lau E, Polly Jr D, Radcliff K. Medical risk factors for opioid-related adverse events after lumbar laminectomy and fusion. Poster No. 04_104, 42nd Annual Meeting of the International Society for the Study of the Lumbar Spine, San Francisco, CA, June 8-12, 2015.

Kurd M, Ong K, Lovald S, Lau E, Polly Jr D, Radcliff K. Opioid-related adverse events with lumbar spine surgery: is the risk real? Poster No. 04_105, 42nd Annual Meeting of the International Society for the Study of the Lumbar Spine, San Francisco, CA, June 8-12, 2015.

Gonzales J, Lovald S, Lau E, Ong K. What Is The Risk Of Potential Opioid-related Adverse Events Following Knee Arthroscopy? Poster 695, 62nd Annual Meeting of the American College of Sports Medicine, San Diego, CA, May 26-30, 2015.

Polly Jr D, Ong K, Lovald S, Lau E, Kurd M, Radcliff K. Opioid-related adverse events with spine surgery: is the risk real? Abstract (Paper) No. A-687-0000-00513, 15th Annual Conference of the International Society for the Advancement of Spine Surgery, San Diego, CA, April 15-17, 2015.

Kurd M, Ong K, Lovald S, Lau E, Polly Jr D, Radcliff K. Opioid-related adverse events with lumbar spine surgery: is the risk real? Abstract (Electronic Presentation) No. 15-A-62-LSRS, 8th Annual Lumbar Spine Research Society Meeting, Chicago, IL, April 9-10, 2015.

Lovald ST, Ong K, Lau E, Joshi G, Kurtz SM, Malkani AL. Patient selection for short-stay total hip arthroplasty. Poster No. 61, 82nd Annual Meeting of the American Academy of Orthopaedic Surgeons, Las Vegas, NV, March 24-28, 2015.

Polly Jr D, Ong K, Lovald S, Lau E, Kurd M, Radcliff K. Opioid-related adverse events with lumbar spine surgery: is the risk real? Abstract (Paper) No. 225, 31st Annual Meeting of the CNS/AANS Section on Disorders of the Spine and Peripheral Nerves, Phoenix, AZ, March 4-7, 2015.

Kurd M, Ong K, Lovald S, Lau E, Polly Jr D, Radcliff K. Opioid-related adverse events following cervical spine surgery. Abstract (Poster) No. 412, 31st Annual Meeting of the CNS/AANS Section on Disorders of the Spine and Peripheral Nerves, Phoenix, AZ, March 4-7, 2015.

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 ST, Ochoa JA, Gaball CW, Ghanem T. Finite-element analysis of rhomboid flap biomechanics in an anisotropic environment. Presented at the American Academy of Otolaryngology meeting, Orlando, FL, Sept 21-24, 2014.

Lovald ST, Ong K, Lau E, Schmier JK, Bozic KJ, Kurtz SM. Mortality, cost and downstream disease of total hip arthroplasty patients in the Medicare population. Paper No. 779, 80th Annual Meeting of the American Academy of Orthopaedic Surgeons, Chicago, IL, March 19-23, 2013.

Lovald S, Ong K, Lau E, Schmier J, Bozic K, Kurtz S. A Medicare analysis of mortality, disease and healthcare spending related to hip osteoarthritis. Poster No. 992, 59th Annual Meeting of the Orthopaedic Research Society, San Antonio, TX, January 26-29, 2013.

Lovald S, Malkani A, Lau E, Ong K, Kurtz S, Schmier J, Manley M. Outpatient TKA: A cost and outcomes analysis. Paper No. 411, 79th Annual Meeting of the American Academy of Orthopaedic Surgeons, San Francisco, CA, February 7-11, 2012.

Lovald S, Lau E, Ong K, Kurtz S, Schmier J, Parvizi J, Bozic K. Cost and disease outcomes of total knee arthroplasty patients in the Medicare population. Poster No. P149, 79th Annual Meeting of the American Academy of Orthopaedic Surgeons, San Francisco, CA, February 7-11, 2012.

Lovald S, Malkani A, Ong K, Lau E, Schmier J, Kurtz S, Manley M. Complications, mortality, and costs after outpatient and short-stay total knee arthroplasty. Paper No. 153, 58th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, February 4-7, 2012.

Lovald S, Ong K, Lau E, Schmier J, Kurtz S, Bozic K, Parvizi J. Medical costs, mortality and, downstream disease in osteoarthritis patients with and without total knee arthroplasty. Poster No. P1941, 58th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, February 4-7, 2012.

Lovald S, Malkani A, Lau E, Ong K, Kurtz S, Schmier J, Manley M. Outpatient TKA: A cost and outcomes analysis. Presentation at the American Academy of Orthopedic Surgeons, San Francisco, CA, February 7-11, 2012.

Topp S, Gaball C, Lovald S, Khraishi T. Analysis and optimization of the rhombic flap wound closure. Presented at the American Academy of Otolaryngology-Head and Neck Surgery Annual Meeting, San Francisco, CA, September 11-14, 2011.

Cowgill I, Child Z, Lovald S, Hanson J, Erdman M, Robinson P, Diamond B. Quality of life among lumbar fusion and joint arthoplasty patients in the elderly population. Presentation at the American Academy of Orthopaedic Surgeons Annual Meeting, San Diego, CA, February 15-18, 2011.

Lovald S, Hanson J, Cowgill I, Erdman M, Diamond B. The ability of preoperative functional scores to predict quality of life after knee arthroplasty. Presentation at the American Academy of Orthopaedic Surgeons Annual Meeting, New Orleans, LA, March 9-13, 2010.

Lovald S, Khraishi T, Heinrich J, Yonas H, Taylor C. Investigating the role of fluid dynamics and wall mechanics in atherosclerosis, plaque rupture and plaque excavation in the human carotid bifurcation. Proceedings, American Society for Engineering Education 2008 Gulf-Southwest Annual Conference, Albuquerque, NM, March 26-28, 2008, Paper #12-19.

Lovald S, Khraishi T, Wagner J, Baack B. Post-surgical finite element analysis of mandibular fracture fixation. Proceedings, the American Society for Engineering Education 2008 Gulf-Southwest Annual Conference, Albuquerque, NM, March 26-28, 2008, Paper #12-20.

Lovald S, Khraishi T, Heinrich J, Yonas H, Taylor C. Three dimensional numerical analysis of flow through the human carotid bifurcation with varying degrees of stenotic plaque formation. Proceedings, 2007 ASME Summer Bioengineering Conference, Keystone, CO, June 20-24, 2007, Paper# SBC2007-176444, pp. 379-380.

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Project Experience

Clinical Project Manager II, PhDx Systems

Cofounder, Lead Engineer, Satyrne Medical, 2006-2010

Research Assistantship - Intramedullary Femoral Nail Failure, University of New Mexico, 2008

Research Assistantship - Stenotic Carotid Blood Flow, University of New Mexico, 2006-2008

Mechanical Engineering Intern, Stryker Leibinger Micro Implants, Summer 2005

Research Fellowship - Craniofacial Trauma Fixation, University of New Mexico, 2003-2006

Mechanical and Biomedical Engineering Independent Consultant, 2003-2010

Editorships & Editorial Review Boards

Editorial Board of the International Journal of Experimental and Computational Biomechanics

Reviewer for Clinical Orthopaedics and Related Research, Journal of Arthroplasty, Acta Anaesthesiologica Scandinavica, Clinical and Experimental Ophthalmology; Arthritis Care & Research, Medical Engineering & Physics, Journal of Trauma, Journal of Healthcare Engineering, Osteoarthritis and Cartilage, International Journal of Experimental and Computational Biomechanics, Scientific Reports, Journal of Medical Devices, Computer Methods in Biomechanics and Biomedical Engineering, Innovation and Research in Bioimedical Engineering