

# ROBERT A POGGIE, PhD

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## SUMMARY

A senior medical device professional with in-depth experience in applied research, regulatory affairs, clinical research, medical education, and commercialization of orthopaedic devices and technologies. Demonstrated experience and success in managing and executing biomaterials development, device testing, class 2 and 3 device regulatory applications, FDA pre-submissions, clinical outcomes strategy & research, FDA master files, technical file creation & updating, clinical evaluation and reporting (for CE Mark / EU regs), and commercialization strategies. Expertise is in orthopaedic biomaterials, TJR arthroplasty devices, spine implants, soft tissue repair & augmentation, synthetic materials for soft tissue repair, and highly cross linked UHMWPE. Proven track record of scientific publications, 510(k) clearances, successful FDA pre-submissions, effective presentations, peer-reviewed papers, abstracts, and conference proceedings, grand-rounds, invited faculty lectures, regulatory and testing strategies, and medical education presentations.

## PROFESSIONAL EXPERIENCE

**BioVera, Inc.**, Notre-Dame-De-L'Île Perrot, (Quebec), CANADA 2010-present  
**BioVera, LLC**, Vero Beach, Florida, USA 2008 - 2017  
*Founder and president of BioVera, Inc. Expertise includes FDA class 2 and 3 device applications, FDA pre-submissions, FDA master files, applied research, device testing, regulatory strategy, clinical research planning, commercialization planning, technology marketing, biomaterials, tribology, professional affairs management, clinical evaluation and reporting (for CE Mark / EU regs), and medical writing. Subcontracted consultants to BioVera include orthopedic surgeons and individuals with expertise in quality assurance, European regulations, clinical research, adult reconstruction, imaging, clinical research, product development, quality assurance & control, design & evaluation, and materials and mechanical engineering.*

## BIOVERA CLIENTS (EXAMPLES, PRESENT & PAST)

**Acuitive Technologies**, Parsippany, NJ, USA 2014-present  
Consultant for regulatory affairs and materials for novel orthopaedic biomaterials & device technologies.

**Bodycad, Inc.**, Quebec City, QC, Canada 2012; 2014-present  
Consultant for regulatory affairs, technology assessment, and device testing.

**NextStep Arthropedix**, Akron, OH, USA 2014-present  
Consultant for regulatory affairs and applied research for X-Linked UHMWPE and TJR products.

**Biorez, Inc.**, New Haven, CT, USA (formerly Soft Tissue Regeneration Inc.) 2008-present  
Consultant for: Regulatory affairs, applied research, pre-clinical evaluation. FDA pre-submission, clinical study planning, and commercialization strategy of a resorbable ACL device in Europe and the USA.

**PPD Group, Inc.**, Waterville, QC, Canada 2016-present  
Consultant: Regulatory Affairs for US FDA Master File for UHMWPE products.

**Bio-Gate, AG**, Nürnberg / Bremen, Germany 2018-present  
Consultant, regulatory affairs.

**Orthofix / Spinal Kinetics**, Lewisville, TX, USA 2018-present  
Consultant, regulatory affairs for Health Canada device applications & communications.

<b>Biedermann-Motech</b> , Villingen-Schwenningen, Germany Consultant, regulatory affairs for class 2 FDA spinal device submissions.	2016-present
<b>PorOsteon</b> , Palo Alto, CA, USA Consultant for regulatory affairs and clinical strategy for porous Nitinol biomaterial and spine devices. Clinical evaluation reviewer / reporter for NeuroStructures devices made from Phusion Metal	2014-present
<b>Field Orthopaedics, Pty</b> , Tenerife, QSL, Australia Consultant: Regulatory Affairs, Device Testing, Planning.	2016-present
<b>Pega Medical Inc.</b> , Laval, QC, Canada Consultant: Regulatory Affairs for US FDA and Health Canada for external clients.	2016-present
<b>AGelity BioMechanics</b> , NY, NY USA Consultant & advisor, regulatory affairs, device evaluation for CE Mark and FDA approval of osteochondral repair implant.	2017-present
<b>MDS</b> , Miami, FL, USA Consultant, regulatory affairs for class 2 FDA device submissions.	2015-2016
<b>AmorChem Financial Inc.</b> , Montreal, Quebec, Canada Consultant, Regulatory, Pre-Clinical, Technology Commercialization Project management, strategic advice towards commercialization, and exit for a novel titanium porous compression screw for bone fixation, and a novel device for reattachment and repair of the greater trochanter.	2013-2017
<b>Halifax Biomedical Inc.</b> , Mabou, Nova Scotia, Canada Consultant; Vice President, RSA Clinical Research and business & surgeon networking.	2009-2017

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## **PROFESSIONAL EMPLOYMENT**

<b>Pipeline Biomedical Holdings, LLC</b> , Parsippany, NJ, USA <b>Vice President, Research &amp; Development</b> <i>Core member of the management team; responsibilities included all aspects of clinical and applied research, determining the potential clinical benefit of new products and technologies, evaluating business opportunities, and providing input into business plans.</i>	2007-2008
<ul style="list-style-type: none"> <li>• Performed extensive literature reviews and prepared plans for applied research, regulatory requirements and clinical studies as part of evaluation and cost-estimating Pipeline's potential business opportunities.</li> <li>• Prepared detailed plan for the development of the antigen (beta-2 transferrin) and an antibody for development of a rapid assay and IVD test kit/strip.</li> <li>• Prepared the preliminary strategies for securing regulatory clearances in the US and EU.</li> <li>• Evaluated the clinical need and global market for a CSF-leak IVD for spine and base skull surgery, endoscopic procedures, traumatic brain injury and patient self-management.</li> <li>• Performed technology review, scientific literature summary and input to business plans for several novel medical devices and instruments for several medical disciplines.</li> <li>• Transitioned from FT employee to consultant / advisor in 2008, through 2011.</li> </ul>	
<b>Zimmer Trabecular Metal Technology, Inc.</b> , Parsippany, NJ, USA <b>Director, Global Brand Management</b> <i>Responsibilities included completion of clinical studies and publication of results, regulatory affairs management, creation and presentation of scientific posters, papers and exhibits, surgeon medical education, and continuous review and trending of product sales. Efforts directly contributed to gaining new surgeon customers and increasing sales with existing Zimmer customers. Sales of Trabecular Metal Technology (TMT) orthopaedic hip, knee, spine, and trauma devices increased 40% or more annually between from 2004 through 2006, and represented Zimmer's premier total joint replacement products.</i>	2004-2007

- Grand rounds, master classes, & conference presentations on TMT laboratory data and clinical results.
- Creation and/or editor of scientific publications, presentations & marketing collaterals for TMT products.
- Coordinated & hosted VIP surgeon visits to Z-TMT (spine & reconstructive); delivered comprehensive scientific overview of TMT products to hundreds of prospective surgeon customers & sales associates.
- Communicated with surgeon consultants re/ongoing clinical studies, coordination of surgeon presentations delivered globally on Trabecular Metal Technology and implants.
- Managed and executed several US and EU regulatory clearances for spine & reconstructive products.
- Drafted and maintained all technical files for TMT products with CE Mark (SGS).
- Advised senior Z-TMT management on process and materials technologies, such as direct molded polyethylene and R&D initiatives regarding Trabecular Metal Technology.

**Implex Corp.**, Allendale, NJ, USA

1995-2004

**Director, Applied Research**

*Managed and participated in the applied research, testing, development, clinical research, and regulatory submissions for Hedrocel porous tantalum devices (Trabecular Metal) and Implex's hip & knee implants. Optimized chemistry and mechanical properties of Hedrocel and developed processing method to increase strength. Successfully published & presented numerous scientific abstracts and papers on the technical and clinical advantages of Implex's novel materials and devices. Initiated and managed several IDE clinical studies, including surgeon recruitment, FDA communications, annual reports, and data analysis.*

- Directed the Applied Research Department and interfaced with product development regarding all aspects of orthopaedic materials and implant development and commercialization.
- Managed the optimization of polyethylene (UHMWPE) manufacturing processes; including direct compression molding, cross-linking, and stabilization processes.
- Managed and participated in several US regulatory clearances for Hedrocel hip, knee & trauma products.

**Smith + Nephew Richards**, Memphis, TN, USA

1992-1995

**Senior Research Engineer**

- Researched new materials and processing methods for orthopaedic implant devices.
- Assisted in process development & characterization of oxidized zirconium alloy (Oxynium) for TJR.
- Developed and characterized a novel hardening process for a new titanium alloy for orthopaedic, cardiovascular and dental applications. Designed and set-up new metallurgical research laboratory.

**James Wert & Associates**, Nashville, TN, USA

1987-1992

**Consulting Engineer**

- Metallurgical characterization and technical services for failure analysis, manufacturing process improvement & quality assurance, and product liability. Researched the tribological behavior of ceramics, metals and polyethylene for orthopaedic bearings and performed detailed metallurgical analyses of Smith + Nephew's Ti-13Nb-13Zr and oxidized Zr-2.5Nb alloys for medical applications.

**GENERAL – PAST & PRESENT**

2008-Present

- OrthoWorld: Guest-author / lecturer for BoneZone; 2017-present.
- Regulatory and applied research & testing consultant to several early stage companies, VCs, and universities for FDA pre-submissions, master files, 510(k)s, and IDE applications; and device evaluation & testing, early-stage regulatory and technology assessment planning for early stage companies.
- Clinical study protocol strategy, research & evaluation of novel total joint replacement products, spine devices and early intervention devices.
- Hospital for Special Surgery, New York City, New York, March 2013-Feb 2014: Consultant, Regulatory & Commercialization Planning. Advised on early stage testing for novel PVA hydrogel for cartilage repair.

## **EDUCATION**

**Vanderbilt University, Nashville, Tennessee** (BE, MS, and PhD degrees)

- Doctorate of Philosophy (PhD), Materials Science and Engineering** 1987-1992
- Friction and wear of materials with a minor in chemistry.
  - Dissertation: "The Relationship Between Ambient Formed Oxides and the Tribological Behavior of Aluminum Bronze", directed by James J. Wert, Ph.D.
  - X-ray photoelectron spectroscopic, tribological & metallographic characterization of unworn and wear damaged metallic surfaces (XPS at HTML, Oak Ridge National Laboratories).
- Master of Science (MS), Materials Science and Engineering** 1984-1986
- Related Minor: Management of Technology.
  - Thesis: "Microstructural Characterization and Comparison of VPPA & TIG Weldments in 2219-T87 Aluminum", directed by Robert J. Bayuzick, Ph.D.
  - SEM, EDS and optical microscopic characterization of weld zone microstructures.
- Bachelor of Engineering (BE), Mechanical & Materials Engineering** 1980-1984
- Mechanical Engineering curriculum with a minor in Materials Engineering
  - Kappa Sigma Fraternity; member 1981-1985, kitchen manger, house officer.
  - OverCup Oak Restaurant & Pub – Work study employment, 1981-1984.

## **ACADEMIC APPOINTMENTS / EXPERIENCE**

- McGill University, Montreal, Canada.** 2017 - present
- Guest lecturer for Biomedical Engineering Department / Masters level classes. Topics include regulatory affairs, clinical affairs, and testing as related to development and commercialization of medical devices.
- University of Mississippi Medical College (UMMC), Jackson, MS.** 1995 - 2007
- Clinical Associate Professor of Orthopedic Surgery & Rehabilitation, School of Medicine,
  - External Examiner for Kenneth St. John. Doctoral Degree awarded in 2001, the UMMC, Jackson, MS.
- University of Canterbury, Christchurch, New Zealand** 2006
- External Examiner for Benjamin Low. Master's Thesis awarded in 2006,
- McGill University, Montreal, Canada.** 1998
- External Examiner for Rocco Varno. Masters Thesis awarded in 1998,

## **PROFESSIONAL SOCIETIES**

- American Association of Hip & Knee Surgeons (AAHKS) – Associate member
- Orthopaedic Research Society. Abstract reviewer for annual meeting, 2008-present.
- American Society for Testing and Materials, F-4, Medical and Surgical Materials and Devices
  - MOSES award; ASTM committee F04, May 8, 1997.
- International Society of Technology in Arthroplasty (ISTA)
- Order of the Engineer – Vanderbilt Chapter

## **PATENTS**

1. "Surface & Near Surface Hardened Medical Implants", patent # 5,372,660, Dec. 13, 1994.
2. "Wear-Resistant Olefinic Medical Implant and Thermal Treatment Container Thereof", patent # 6,355,215, March 12, 2002. (highly cross-linked polyethylene).

## **PEER-REVIEWED PAPERS, SYMPOSIA, AND SCIENTIFIC EXHIBITS**

*Primary author or significant technical and/or editorial contributor to numerous peer reviewed publications in the leading clinical and scientific journals in orthopedic, biomaterials and engineering research. The subject matter has included theoretical concepts, engineering data & analysis, and clinical results.*

1. Thomas J. O'Keefe, Suzanne Winter, David G. Lewallen, Douglas D. Robertson, and Robert A. Poggie, "CLINICAL AND RADIOGRAPHIC EVALUATION OF A MONOBLOCK TIBIAL COMPONENT WITH MINIMUM TWELVE YEAR FOLLOW-UP", accepted for publication in the JOA, in press.
2. TJ O'Keefe, S Winter, DG Lewallen, DD Robertson, RA Poggie, "Clinical and Radiographic Evaluation of a Monoblock Tibial Component with Minimum Five-Year Follow-Up", *The Journal of Arthroplasty*, Vol. 25, No. 5, August 2010, pp 795-792.
3. RA Poggie, T Turgeon, RD Coutts, "Failure Analysis of a Ceramic-Bearing Acetabular Component", *JBJS (Am)*, 89:367-375, February 2007.
4. BR Levine, S Sporer, RA Poggie, CJD Valle, JJ Jacobs, "Experimental and Clinical Performance of Porous Tantalum in Orthopaedic Surgery", *Biomaterials*, 27 (2006), pp 4671 - 4681.
5. D Lewallen, M Meneghini, Robert Poggie, Arlen Hanssen, "Revision Hip Arthroplasty With Porous Tantalum Augments and Acetabular Shells", Scientific Exhibit (SE03), the annual meeting of the AAOS, Chicago, IL, March 22-26, 2006. *Exhibit was winner of AAOS Award for Excellence for Scientific Exhibits in 2006.*
6. AK Tsao, JR Roberson, MJ Christie, DD Dore, DA Heck, DD Robertson, RA Poggie, "Biomechanical and Clinical Evaluations of a Porous Tantalum Implant for the Treatment of Early-Stage Osteonecrosis", *JBJS*, Vol. 87-A, Supplement 2, Dec. 2005, pp 22-27.
7. T Gruen, RA Poggie, A Hanssen, D Lewallen, R Lewis, T O'Keefe, SD Stulberg, C Sutherland, "Radiographic Evaluation of a Monoblock Acetabular Component – A Multi-Center Study With 2 To 5 Year Results", *The Journal of Arthroplasty*, Vol. 20, No. 3, April, 2005, pp 369-378.
8. A Tsao, M Christie, D Dore, B Stulberg, D Heck, J Roberson, R Poggie, "Biomechanical and Clinical Evaluations of a Porous Metal Implant for Intervening in Early Stage Osteonecrosis", a Scientific Exhibit at the 2005 AAOS, Washington DC, February 2005.
9. B Chalkin and J Minter (R Poggie - writer & editor), "Case Report – Limb Salvage and Abductor Reattachment Using a Custom Prosthesis with Porous Tantalum Components", *The Journal of Arthroplasty*, Vol. 20, No. 1, January 2005, pp 127-130.
10. J.D. Bobyn, R.A. Poggie, J.J. Krygier, D.G. Lewallen, A.D. Hanssen, MD, R.J. Lewis, A.S. Unger, T.J. O'Keefe, M.J. Christie, S. Nasser, J.E. Wood, D. Stulberg, M. Tanzer, "Clinical Validation of a Structural Porous Tantalum Biomaterial for Adult Reconstruction", *the Journal of Bone & Joint Surgery*, Volume 86A, Supplement 2, December 2004, pp 123-129.
11. S Nasser and RA Poggie, "Revision and Salvage Patellar Arthroplasty Using A Porous Tantalum Implant", *The Journal of Arthroplasty*, Vol. 19, No. 5, August 2004, pp 562-572.
12. JD Bobyn, M Tanzer, JJ Krygier, DG Lewallen, A Hanssen, R Lewis, A Unger, TJ O'Keefe, MJ Christie, S Nasser, J Wood, SD Stulberg, RA Poggie, "Clinical Validation of a Structural Porous Biomaterial for Adult Reconstruction", presented as a Scientific Exhibit (SE 013) at the 71<sup>st</sup> Annual Meeting of the AAOS, March 10-14, 2004, San Francisco, CA. *Exhibit was winner of AAOS Award for Excellence for Scientific Exhibits in 2004.*

13. KR St. John, LD Zardiackas, RA Poggie, "Wear Evaluation of Cobalt-Chromium Alloy for Use in a Metal-On-Metal Hip Prosthesis", *Journal of Biomedical Materials Research Part B, Applied Biomaterials*, January 2004.
14. DJ Medlin, S Charlebois, D Swarts, R Shetty, RA Poggie, "Metallurgical Characterization of a Porous Biomaterial (Trabecular Metal) for Orthopaedic Implant Applications", *ASM Conference on Biomaterials*, Anaheim, CA, September 9-11, 2003, published in *Medical Device Materials*, ASM, March 2004.
15. KR St. John and RA Poggie, "Characterization of the Wear Performance of Cross-Linked UHMWPE and Relationship to Molding Procedures", *ASTM STP 1445, Cross-linked and Thermally Treated UHMWPE for Joint Replacements*, SM Kurtz, R Gsell, and J Martell, Eds., ASTM International, West Conshohocken, PA, 2003.
16. RA Poggie and RD Coutts, "Implant Design and Mechanical & Tribological Characterization of Low-Wear Artificial Hip Joints", *Bioceramics in Joint Arthroplasty*, presented at the 7<sup>th</sup> International BioloX Symposium, Stuttgart, Germany, March 15 & 16, 2002.
17. J.B. Stiehl and R.A. Poggie, "Cross-linking of Polyethylene with Gamma Radiation Can Significantly Reduce Wear", *Scientific Exhibit (SE 038) at the 68<sup>th</sup> Annual Meeting of the AAOS*, February 28 – March 4, 2001, San Francisco, CA.
18. LD Zardiackas, DE Parsell, LD Dillon, DW Mitchell, LA Nunnery, R Poggie, "Structure, Metallurgy, and Mechanical Properties of a Porous Tantalum Foam", *JBMR* published on line, January 17, 2001, John Wiley & Sons, *JBMR*, pp 180 - 187.
19. R.A. Poggie, "Polyethylene: Current and Future", Chairman & co-presenter of Special Symposia, the 25<sup>th</sup> Annual Society for Biomaterials Meeting, April 28-May 2, 1999, Providence, RI.
20. T.D. Brown, R.A. Brand, D.R. Pedersen, A.D. Heiner, R.A. Poggie, and M.J. Christie, "Biomechanics of Femoral Head Osteonecrosis: Natural History and Head-Preserving Surgical Management", *A Scientific Exhibit at the 66<sup>th</sup> Annual AAOS*, February 4-8, 1999, Anaheim, CA.
21. R.A. Poggie, "Polyethylene – 101", Chairman & co-presenter for ORS Polyethylene Workshop, the 45<sup>th</sup> Annual ORS, February 1 – 4, 1999, Anaheim, CA.
22. Zhang Y, Ahn PB, Fitzpatrick DC, Heiner AD, Poggie RA, Brown, TD, "Interfacial frictional behavior: Cancellous bone, cortical bone, and a novel porous tantalum biomaterial", *Journal of Musculoskeletal Research*, 3(4): 245-251, 1999.
23. A.D. Heiner, R.A. Poggie, and T.D. Brown, "Flexural Rigidity of Laboratory and Surgical Substitutes for Human Fibular Bone Grafts", *Journal of Musculoskeletal Research*, Vol. 2, No. 4 (1998), pp 267-272.
24. K.R. St. John, R.A. Poggie, L.D. Zardiackas, R.M. Afflitto, "Comparison of Two Cobalt-Based Alloys for Use In Hip Replacement: Evaluation of the Wear Properties in a Hip Simulator", November 1998 *ASTM Symposium on Cobalt Base Alloys*; ASTM STP.
25. R.A. Poggie, M. Takeuchi, S. Nasser, and R. Averill, "Effects of Resin Type, Consolidation, and Process Parameters on UHMWPE", presented at *ASTM Symposium*, published in *STP 1307*, Editors R. Gsell, H. Stein, J. Ploskonka, 1997.
26. R.A. Poggie, "A Review of the Effects of, Design, Contact Stress, and Materials on the Wear of Metal-On-Metal Hip Prostheses", presented at *ASTM Symposium on Alternative Bearings*, Nov. 1997, published in *ASTM STP 1346*.

27. J.B. Medley, J.M. Dowling, R.A. Poggie, J.J. Krygier, and J.D. Bobyn, "Simulator Wear of Some Commercially Available Metal On Metal Hip Implants", presented at ASTM Symposium on Alternative Bearings, Nov. 1997, published in ASTM STP 1346.
28. A.K. Mishra, J.A. Davidson, R.A. Poggie, P. Kovacs and T.J. Fitzgerald, "Mechanical and Tribological Properties and Biocompatibility of Diffusion Hardened Ti-13Nb-13Zr - A Low Modulus Titanium Alloy for Orthopaedic Devices", presented by R. A. Poggie at Symposium on Medical Applications of Titanium and Its Alloys: The Material and Biological Issues, Nov. 15, 1994, Phoenix, AZ, published in ASTM STP 1272, S. A. Brown and J. E. Lemons, Eds., American Society for Testing Materials, Philadelphia, PA, 1995.
29. S.E. White, L.A. Whiteside, D.S. McCarthy, M. Anthony and R.A. Poggie, "Simulated Knee Wear with Cobalt Chromium and Oxidized Zirconium Knee Femoral Components", presented at the Knee Society meeting, CORR, No. 309, December, 1994 pp. 176-184.
30. J.A. Davidson, R.A. Poggie and A.K. Mishra, "Abrasive Wear of Ceramic, Metal and UHMWPE Bearing Surfaces from Third-Body Wear Bone, PMMA Cement and Titanium Debris", ISABE '93 Symposium on Advanced Biomaterials, Sept. 1-4, 1993, Utsunomiya, Japan, Biomedical Materials & Engineering, Elsevier Science Ltd., Vol. 4, No. 3, 1994, pp 213 - 230.
31. Davidson, J.A., Kovacs, P., Mishra, A.K. and Poggie, R.A., "Modular Implant Interfaces and What's Going on Within the Crevice", 6th Intl. Conf. on Custom Prostheses, Sept. 30-Oct. 2, 1993, J.B.J.S., 1994.
32. A.K. Mishra, J.A. Davidson and R. A. Poggie, "Diffusion Hardening - A New Surface Hardening Process for Titanium Alloys", Surface Modification Technologies VII, T. S. Sudarshan et. al. (Eds.), The Institute of Materials, London, 1994.
33. R.A. Poggie, A.K. Mishra and J.A. Davidson, "Three Body Abrasive Wear Behavior of Orthopaedic Implant Bearing Surfaces from Titanium Debris", 10th ESB Conf., Davos, Switzerland, Sept. 8-11, 1993, published in the Journal of Materials Science: Materials in Medicine, Vol. 5, (1994), pp. 387-392.
34. A.K. Mishra, J.A. Davidson, P. Kovacs and R.A. Poggie, "Ti-13Nb-13Zr: A New Low Modulus, High Strength, Corrosion Resistant Near-Beta Alloy for Orthopaedic Implants", Beta Titanium Alloys in the 1990's, Ed. by D. Eylon, R. R. Boyer and D. A. Koss, The Minerals, Metals & Materials Society, 1993, pp 61-72.
35. R.A. Poggie, J.J. Wert and L.A. Harris, "Surface Oxidation and Segregation Effects on the Tribological Behavior of Aluminum Bronze Alloys", J. Adhesion Sci. Technol., Vol. 8, No. 1, pp. 11-28 (1994).
36. R.A. Poggie and J.J. Wert, "The Role of Oxidation in the Friction and Wear Behavior of Solid Solution Copper-Aluminum Alloys in Reciprocating Sliding Contact With Sapphire and D2 Tool Steel", Wear, 156 (1992), pp 315-326.
37. R.A. Poggie, J.J. Wert, J.A. Davidson and A.K. Mishra, "Friction and Wear Characterization of UHMWPE in Reciprocating Sliding Contact With Co-Cr, Ti6Al-4V, and Zirconia Implant Bearing Surfaces", presented at Wear and Friction of Elastomers Symposium, ASTM committee G-2, Dec. 4, 1991, Philadelphia, PA; ASTM STP 1145.
38. R.A. Poggie and J.J. Wert, "The Influence of Surface Finish and Strain Hardening on Near Surface Residual Stress and the Friction and Wear Behavior of A2, D2 and CPM-10V Tool Steels", 8th Intl Conf on Wear of Materials, April, 1991, Wear, 149 (1991), pp 209-220.

## **PUBLISHED ABSTRACTS AND CONFERENCE PRESENTATIONS & PROCEEDINGS**

*Over eighteen years of effective communications to a wide variety of target audiences such as engineering peers, executive management, surgeons, health professionals, and sales associates. Since 1992, more than 60 abstracts, conference proceedings papers and poster exhibits have been presented worldwide. In addition, numerous presentations and papers have been presented at international and regional conferences, medical center grand rounds, as invited faculty, and for company sponsored medical education events.*

1. Bhavana Mohanraj; Vedran Lovric; Kevin Rocco; Robert Poggie; Chris Christou; William Walsh, "Mechanical Degradation Study and Subcutaneous Evaluation of a Bioresorbable Scaffold for ACL Reconstruction", poster 1435, annual ORS meeting, March 2019, Las Vegas, NV, USA.
2. G Rivet-Sabourin PhD, M Bedard, H Robichaud, M Angers MD, R Poggie PhD, E Belzile MD, "Evaluation of Accuracy of Serial Drilling Bone Resection and Patient-Specific Guides in Cadaver UKA Surgery", The 2018 annual meeting of the Orthopaedic Research Society, March 10 - 13, 2018, New Orleans, Louisiana, USA.
3. Robert A. Poggie, Louis-Philippe Lefebvre, Stéphanie Grenier, Madeleine Chagnon, Michel Assad, "Efficacy of a New Porous Titanium Compression Screw using an Ovine Osseointegration Model", accepted for podium presentation, annual meeting of the ORS, Orlando, FL, March 2016.
4. Robert A. Poggie, Louis-Philippe Lefebvre, Stéphanie Grenier, Madeleine Chagnon, Michel Assad, "Osseointegration and Defect Repair with a New Porous Titanium Screw in Ovine Long-Bone Models for Gap-Healing, Osteonecrosis, and Bone Ingrowth", accepted for poster presentation at the annual SFB meeting / WBC, Montreal, Canada, May 2016.
5. William Walsh, Nicky Bertollo, Robert Arciero, Robert Stanton, Robert Poggie, "Long-term In-vivo Evaluation Of A Resorbable PLLA Scaffold For Regeneration Of The ACL", Published August 3, 2015 *Orthopaedic Journal of Sports Medicine July 2015 vol. 3 no. 2 suppl 2325967115S00033*; , doi: 10.1177/2325967115S00033; podium presentation at the annual meeting of the AOSSM, July 2015, Orlando, FL.
6. William R. Walsh, Nicky Bertollo, Robert Arciero, Robert Stanton, Robert A. Poggie, "Long-term In-vivo Evaluation of a Resorbable PLLA Device for Regeneration of the Anterior Cruciate Ligament", podium presentation at the annual meeting of the ORS, March 2015, Las Vegas, NV.
7. William R. Walsh, Nicky Bertollo, Phillip Heuberer, Chris Christou, Robert Stanton, Robert Poggie, "Evaluation of a PLLA Device In-vitro and in an Ovine Model of Acute Rupture of the Rotator Cuff", poster presentation at the annual meeting of the ORS, March 2015, Las Vegas, NV.
8. Robert Stanton, Nicky Bertollo, Robert Arciero, Robert Poggie, and William R. Walsh, "Long-Term In-Vivo Evaluation of a Resorbable PLLA Device for Regeneration of the Anterior Cruciate Ligament", accepted for e-poster presentation, ISAKOS, June 2015, Lyon, France.
9. William R Walsh, Nicky Bertollo, Robert Arciero, Robert Stanton, and Robert Poggie, "IN-VIVO EVALUATION OF A BIORESORBABLE PLLA DEVICE FOR REGENERATION OF THE ACL", podium presentation, ISL&T, March 2015, Las Vegas, NV.
10. Robert Poggie, Simon Carrier, Phillip Rouseau, Daniel Morrissette, Helmut Thissen, Paul Pasic, Graham Johnson, Penny Bean, Keith McLean, William Walsh, "Development of Porous PEEK and Surface Modified PEEK for Musculoskeletal Applications", MEDICAL GRADE POLYMERS 2012, September 25 - 26, 2012, Woburn, Massachusetts, USA.
11. Robert Poggie, Simon Carrier, Phillip Rouseau, Daniel Morrissette, Helmut Thissen, Paul Pasic, Graham Johnson, Penny Bean, Keith McLean, William Walsh, "Porous PEEK and Surface Modified PEEK for Musculoskeletal Applications", accepted for presentation at the 1<sup>st</sup> International PEEK Meeting in Philadelphia, PA, USA, April 25 and 26, 2013.



12. Carrier, S; Rousseau, P; Morrissette, D; Poggie, “Characterization of Porous PEEK for Musculoskeletal Applications”, 2012 World Biomaterials Congress, Chengdu, China, June 1-5, 2012.
13. William Walsh, Nicky Bertollo, Cato Laurencin, Robert Arciero, and Robert Poggie, “Regeneration of the Anterior Cruciate Ligament (ACL) in an Ovine Model Using a Resorbable Polymer Scaffold”, poster presentation at the annual AAOS meeting, February, 2012, San Francisco, CA.
14. Thissen, H; Pasic, P; Johnson, G; Bean, P; McLean, K; Poggie, R, “Development and Characterization of Surface Modified PEEK for Bone-Contacting Applications” podium presentation at the 2012 annual meeting of the ORS, February 2012, San Francisco, CA.
15. W.R. Walsh, N. Bertollo, A. Rives, J. Crosby, R. Da Assuncao, R. Poggie, L. Nair, M. Aronson, C. Laurencin, “Preclinical results in-vitro and in sheep for 12 and 26 weeks for the L-C Ligament, a biodegradable PLLA scaffold for anterior cruciate ligament regeneration”, e-poster at the 12<sup>th</sup> EFFORT Congress, June 1 – 4, 2011, Copenhagen, Denmark.
16. TJ O’Keefe, S Winter, RA Poggie, “Five Year Outcome of a Cemented One-piece Porous Tantalum Tibial Component in Total Knee Replacement”, the 75<sup>th</sup> annual meeting of the AAOS, San Francisco, CA, March 5-9, 2008.
17. LC Jordan, LR Jordan, JB Stiehl, D King, M Balas, DD Robertson, RA Poggie, Jane Olivo, “Prospective, Randomized Clinical Evaluation of a Metal Bearing Acetabular Cup”, poster presentation at the annual meeting of the AAOS, Chicago, IL, March 22-26, 2006.
18. RA Poggie – Faculty Member, IMECHE’s Knee Arthroplasty: Engineering Functionality, April 7-9, 2005, Royal College of Surgeons, London, UK. Presentations “Preliminary Clinical and Radiographic Results of Porous Tantalum in Primary TKA” and “A Structural Porous Metal Alternative to Allograft and Autograft Bone in Revision and Salvage TKA”; conference proceedings: pp 57-60 and 69-72.
19. RA Poggie, M Tanzer, JJ Krygier, DG Lewallen, A Hanssen, R Lewis, A Unger, TJ O’Keefe, MJ Christie, S Nasser, J Wood, SD Stulberg, JD Bobyn, “Clinical Validation of a Structural Porous Biomaterial for Adult Reconstruction”, the 17<sup>th</sup> annual International Society for Technology in Arthroplasty, September 23-25, 2004, Rome, Italy.
20. S Nasser and RA Poggie, “4 to 6 Year Clinical Results With A Porous Tantalum Patellar Augment/Replacement”, the 17<sup>th</sup> annual International Society for Technology in Arthroplasty, September 23-25, 2004, Rome, Italy.
21. S Nasser and RA Poggie, “Salvage Patellar Arthroplasty With A Porous Tantalum Implant – 2 to 4 Year Results”, poster presentation (P102) at the 2004 AAOS, March 10-14, 2004, San Francisco, CA.
22. T Gruen, M Christie, A Hanssen, D Lewallen, R Lewis, T O’Keefe, SD Stulberg, C Sutherland, A Unger, RA Poggie, “Radiographic Evaluation of a Non Modular Acetabular Cup – A 2 to 5 Year Multi-Center Study”, poster presentation (P048) at the 2004 AAOS, March 10-14, 2004, San Francisco, CA.
23. CS Florio, RA Poggie, C Sidebotham, DG Lewallen, A Hanssen, “Stability Characteristics of a Cementless Monoblock Porous Tantalum Tibial Implant Without Ancillary Fixation”, the 2004 Annual Meeting of the ORS, March 7-10, 2004, San Francisco, CA.
24. S David Stulberg and RA Poggie, “Trabecular Metal in Primary and Revision Arthroplasty”, breakout session & presentation at the 15<sup>th</sup> annual International Society for Technology in Arthroplasty, September, 2002, Oxford, UK.

25. B Stulberg, M Christie, R Poggie, J Roberson, "Preliminary Clinical Results of a Porous Tantalum Implant for Intervening in Femoral Head Osteonecrosis", the 14<sup>th</sup> Annual International Society for Technology in Arthroplasty, September 26 – 29, 2001, Maui, Hawaii.
26. R Cohen and R Poggie, "A Porous Tantalum Trabecular Metal: Basic Science", Carbon 2001, Lexington, KY, July 2001.
27. RA Poggie, R Afflitto, and K St. John, "Characterization of Wear, Frictional Torque, and Metal Ion Release For Precision Metal-On-Metal Hip Bearings", presented at the Annual Meeting of the American Society for Biomaterials, April 24-29, 2001.
28. A Gunson, M Kral, and R Poggie, "Three Dimensional Reconstruction and Modeling of a Porous Tantalum Biomaterial", presented at the Annual Meeting of the American Society for Biomaterials, April 24-29, 2001.
29. A.D. Heiner, T.D. Brown, R.A. Poggie, "Structural Efficacy of a Novel Porous Tantalum Implant for Osteonecrosis Grafting", the 47<sup>th</sup> Annual Meeting of the ORS, February 25-28, 2001, San Francisco, CA.
30. R.A. Poggie, R.C. Cohen, M. J. Christie, A. Heiner, T.D. Brown, "Biomechanical Analysis and Clinical Study of a Porous Tantalum Implant for Intervening in Femoral Head AVN", Annual ARCO Meeting & International Symposium, Oct. 4 – 6, 2000, Baltimore, MD, pp 23.
31. M.J. Christie, R.A. Poggie, R.C. Cohen, A. Heiner, T.D. Brown, "Biomechanical Analysis and Clinical Application of a Porous Metal Implant for Femoral Head AVN", the 13<sup>th</sup> Annual International Society for Technology in Arthroplasty, September 20 – 23, 2000, Berlin, Germany.
32. J. Minter, R. Poggie, C. Sidebotham, G. Smith, "In-vivo Analysis of a Canine Segmental Hip Implant and Limb Salvage Using a Custom Hip Prosthesis", the 13<sup>th</sup> Annual International Society for Technology in Arthroplasty, September 20 – 23, 2000, Berlin, Germany.
33. J.B. Stiehl, R.C. Cohen, R.A. Poggie, "Characterization of a Low Stiffness Non-Modular Porous Fixation Tibial Component", the 13<sup>th</sup> Annual International Society for Technology in Arthroplasty, September 20 – 23, 2000, Berlin, Germany.
34. R.D. Coutts and R.A. Poggie, "Biomechanical Analysis of a Porous Tantalum Acetabular Cup With a Ceramic Bearing", the 13<sup>th</sup> Annual International Society for Technology in Arthroplasty, September 20 – 23, 2000, Berlin, Germany.
35. M.J. Christie, R.A. Poggie, R.C. Cohen, A. Heiner, T.D. Brown, "Structural Analysis and Clinical Case Report of a Porous Tantalum Trabecular Metal Implant for Intervening in Femoral Head Avascular Necrosis", The 2000 Annual Meeting of the Southern Orthopaedic Association, July 20 –22, 2000, Southampton, Bermuda.
36. T. O'Keefe, R. Cohen, R. Averill, R. Zubok, and R. Poggie, "Design Principles of a Proximal Locking Hip", The Annual Scientific Meeting of the Australian Orthopaedic Association, October 11 – 15, 1999, Brisbane, Australia (presented by Anthony Unger, MD).
37. T. O'Keefe, R. Cohen, R. Averill, R. Zubok, and R. Poggie, "Design Principles of a Novel Mono-Block Acetabular Cup", The Annual Scientific Meeting of the Australian Orthopaedic Association, October 11 – 15, 1999, Brisbane, Australia (presented by A. Unger, MD).
38. R. A. Poggie, R. Afflitto, R. G. Averill, and K. St. John, "The Wear Resistance of Two Types of Cross-Linked Polyethylene Materials", the 12<sup>th</sup> Annual International Society for Technology in Arthroplasty, September 22 - 25, 1999, Chicago, Illinois.

39. R.A. Poggie, J. Davis, R. Jinnah, "Characterization of a Mono-Block Acetabular Cup for Metal-On-Metal Articulation", the 12<sup>th</sup> Annual International Society for Technology in Arthroplasty, September 22 - 25, 1999, Chicago, Illinois.
40. R.A. Poggie, R. Afflitto, K. St. John, "The Wear Performance of Precision Co-Cr-Mo Alloy Metal-On-Metal Hip Bearings", the 12<sup>th</sup> Annual International Society for Technology in Arthroplasty, September 22 - 25, 1999, Chicago, Illinois.
41. D Mitchell, JA Bogan, DE Parsell, RA Poggie, and LD Zardiackas, "Compressive and Bending Fatigue of a Cellular Porous Tantalum Biomaterial", 1999 American Society for Biomaterials Annual Meeting, Providence, RI, April 28-May 2<sup>nd</sup>.
42. LD Zardiackas, LA McCaskill, LD Dillon, DE Parsell, and RA Poggie, "Structural, Metallurgical, and Mechanical Evaluation of a Porous Tantalum Biomaterial", 1999 American Society for Biomaterials Annual Meeting, Providence, RI, April 28-May 2.
43. K. St. John, R. Afflitto, R. G. Averill, and R. A. Poggie, "Wear Resistance of Two Types of Cross-Linked Polyethylene Materials", 1999 American Society for Biomaterials Annual Meeting, Providence, RI, April 28-May 2.
44. J.J. Krygier, J.D. Bobyn, R.A. Poggie, R.C. Cohen, "Mechanical Characterization of a New Porous Tantalum Biomaterial for Orthopaedic Reconstruction", Proc. SIROT, Sydney, Australia, 1999.
45. K.R. St. John, R.A. Poggie, L.D. Zardiackas, and J.L. Hughes, "Materials for the Manufacture of Total Hip Bearing Surfaces: A Comparison of the Wear Resistance of Two Polyethylene and Two Metallic Bearing Materials", presented as a Poster Exhibit at the 66<sup>th</sup> Annual AAOS, February 4-8, 1999, Anaheim, CA.
46. D.R. Pedersen, T.D. Brown, R.A. Poggie, "Finite Element Analysis of Peri-Acetabular Stress of Cemented, Metal-Backed, and Porous Tantalum Backed Acetabular Components", the 45<sup>th</sup> Annual ORS, Feb. 1-4, 1999, Anaheim, CA, pp. 747.
47. J.B. Medley, J.M. Dowling, R.A. Poggie, J.J. Krygier, and J.D. Bobyn, "Simulator Wear of Metal On Metal Hip Implants From European Manufacturers", presented at the November 1998 ASTM Symposium on Cobalt based alloys.
48. M.J. Christie, D.K. DeBoer, R.C. Cohen, and R.A. Poggie, "Distal Femoral Reconstruction Using a Novel Porous Tantalum Structural Biomaterial", the 11<sup>th</sup> Annual International Society for Technology in Arthroplasty, October 1 – 3, 1998, Marseille, France.
49. R.A. Poggie, R.C. Cohen, D.R. Pedersen, and T.D. Brown, "Peri-Acetabular Stress Distributions for a Porous Tantalum-Polyethylene Acetabular Cup and Three Contemporary Cup Designs", the 11<sup>th</sup> Annual International Society for Technology in Arthroplasty, October 1 – 3, 1998, Marseille, France.
50. R.A. Poggie, R. Afflitto, R.G. Averill, and S. Nasser, "Polyethylene Consolidation Method and Resin Type Effect Resistance to Degradation", the 11<sup>th</sup> Annual International Society for Technology in Arthroplasty, October 1 – 3, 1998, Marseille, France.
51. R.C. Cohen, R.A. Poggie, and R.G. Averill, "Characterization of a Porous Tantalum, Direct Compression Molded Polyethylene Acetabular Cup", the 11<sup>th</sup> Annual International Society for Technology in Arthroplasty, October 1 – 3, 1998, Marseille, France.

52. M.J. Christie, D.K. DeBoer, R.C. Cohen, and R.A. Poggie, "Proximal Tibial Reconstruction, Tibial Tubercle Reattachment, and TKA With a Structural Porous Tantalum Biomaterial", the 11<sup>th</sup> Annual International Society for Technology in Arthroplasty, October 1 – 3, 1998, Marseille, France.
53. R.A. Poggie, R.C. Cohen, D.R. Pedersen, A. Heiner, and T.D. Brown, "Structural Analysis of a Porous Tantalum Material for Intervention in Femoral Head AVN", the 11<sup>th</sup> Annual International Society for Technology in Arthroplasty, October 1 – 3, 1998, Marseille, France.
54. A.D. Heiner, R.A. Poggie, and T.D. Brown, "Flexural Rigidity of New Laboratory and Surgical Substitutes for Human Fibular Bone Grafts", the 22<sup>nd</sup> Annual American Society for Biomechanics Conference, Waterloo, Canada, September 1998.
55. P. Layrolle, R. Dalmeijer, R. Poggie, R. Cohen, and C.A. van Blitterswijk, "Biomimetic Calcium Phosphate Coatings on Porous Tantalum Implant", the 14<sup>th</sup> Annual European Conference on Biomaterials, September 15-18<sup>th</sup>, 1998, The Hague, The Netherlands.
56. R.A. Poggie, M.J. Christie, D.K. DeBoer, and R.C. Cohen, "Attachment of the Tibial Tubercle and Total Knee Reconstruction Using a Novel Porous Tantalum Biomaterial", 1998 Society for Biomaterials Meeting, San Diego, CA, pp 472.
57. R.M. Afflitto, R.A. Poggie, R.C. Cohen, and R.G. Averill, "Comparison of the Resistance to Oxidation of Three Types of Polyethylene", 1998 Society for Biomaterials Meeting, San Diego, CA, pp 157.
58. R.A. Poggie, R.C. Cohen, R.G. Averill, and R.M. Afflitto, "Characterization of a Direct Compression Molded Polyethylene – Porous Tantalum Interface", 1998 Society for Biomaterials Meeting, San Diego, CA, pp 248.
59. R.A. Poggie, R.C. Cohen, R.G. Averill, "Characterization of a Porous Metal, Direct Compression Molded UHMWPE Junction", 44<sup>th</sup> ORS, New Orleans, LA, 1998, pp 777.
60. R.A. Poggie, S.M. Kulkarni, S. Nasser, "Stress and Strain Analysis of Modular Hip Tapers", 44<sup>th</sup> ORS., New Orleans, LA, 1998, pp 415.
61. D. Fitzpatrick, P. Ahn, T. Brown, R. Poggie, "Friction Coefficients of Porous Tantalum and Cancellous & Cortical Bone", presented at the 21<sup>st</sup> Annual American Society for Biomechanics, Clemson, SC, Sept. 24-27, 1997.
62. R. Poggie, S. Nasser, and S. Kulkarni, "Finite Element Analysis of Morse Tapers: Micro Motion as a Function of Diameter and Modular Head-Neck Extension", 23<sup>rd</sup> Annual Society for Biomaterials Meeting, April 30-May 4, 1997, New Orleans, LA, pp. 417.
63. K. St. John, M. Takeuchi, and R. Poggie, "Effects of Radiation Dose and Packaging Condition on the Oxidation of UHMWPE", 23<sup>rd</sup> Annual Society for Biomaterials Meeting, April 30-May 4, 1997, New Orleans, LA, pp. 46.
64. R. Poggie, S. Nasser, R. Averill, "Effects of Resin Type, Consolidation Method, and Sterilization on UHMWPE", 23<sup>rd</sup> Annual Society for Biomaterials Meeting, April 30-May 4, 1997, New Orleans, LA, pp. 216.
65. D. Pedersen, T. Brown, and R. Poggie, "Finite Element Characterization of a Porous Tantalum Material for Treatment of Avascular Necrosis", 43<sup>rd</sup> ORS, Feb. 9-13, 1997, San Francisco, CA, pp. 598.

66. R.A. Poggie, P. Kovacs, and J.A. Davidson, "Oxygen Diffusion Hardening of Ti-Nb-Zr Alloys", Ninth International Conference on Surface Modification Technologies, TMS/ASM Materials Week, October 30 - November 2, 1995, Cleveland, Ohio.
67. J.A. Davidson, P. Kovacs, S.M. Slack, R.A. Poggie, L.J. Carmack, M. Kh. Dabbous, and K.P. Daigle, "Heart Valve Design Optimization Using Hemocompatible, High-Strength, Wear-Resistant Oxidized Zirconium Alloy ZrO<sub>2</sub>/Zr", 12th European Conference on Biomaterials, Porto, Portugal, Sept. 10-13, 1995.
68. S.E. White, L.A. Whiteside, R.A. Poggie, D. Farrar, and M.G. Tanner "In-Vivo Wear and Materials Properties of UHMWPE Tibial Components", Technical Exhibit at the 62<sup>nd</sup> Annual AAOS Meeting, Feb. 16-20, 1995.
69. A.K. Mishra, J.A. Davidson, R.A. Poggie and T.J. Fitzgerald, "Material Issues in Orthopaedic Devices", ASM/TMS, Materials Week, Oct. 2 - 6, 1994, Chicago, Illinois.
70. R.A. Poggie, J.A. Davidson and A.K. Mishra, "An Analysis of the Chemical Properties and Hardness of the Near Surface of Diffusion Hardened Ti-13Nb13Zr" presented at the Surfaces in Biomaterials Meeting, Scottsdale, AZ, September 7 - 10, 1994.
71. A.K. Mishra, K.P. Daigle and R.A. Poggie, "Fretting and Corrosion Resistance of 316L Stainless Steel and Diffusion Hardened Ti-13Nb-13Zr Bone Plate Constructs", 20th Annual Meeting of the Society for Biomaterials, April 5-9, 1994, Boston, MA.
72. S.E. White, D.S. McCarthy, K.P. Daigle, M.E. Anthony, R.A. Poggie and L.A. Whiteside, "Simulated Knee Wear with CoCr and Zirconia (ZrO<sub>2</sub>)-Coated Zirconium (Zr-2.5Nb) Knee Femoral Components", Poster Exhibit, 1994 AAOS Meeting, New Orleans, LA, Feb. 1994.
73. A.K. Mishra, J.A. Davidson and R.A. Poggie, "Diffusion Hardening: A New Surface Treatment to Prevent Black Debris Formation in Titanium Alloys," Poster Presentation, 40th Meeting ORS, Feb. 21-24, 1994, New Orleans, LA.
74. J.A. Davidson, A.K. Mishra, P. Kovacs and R.A. Poggie, "New Surface Hardened, Low-Modulus, Corrosion Resistant Ti-13Nb-13Zr Alloy for Total Hip Arthroplasty", ISABE '93 Symposium on Advanced Biomaterials, Sept. 1-4, 1993, Utsunomiya, Japan, Biomedical Materials and Engineering, Elsevier Science Ltd., Vol. 4, No. 3, 1994, pp 231 - 244.
75. J.A. Davidson, A.K. Mishra, P. Kovacs and R.A. Poggie, "New Low-Modulus, High Strength, Corrosion Resistant Ti-13Nb-13Zr Alloy for Orthopaedic Implant Applications", Proc. of the 7th Intl. Conf. on Biomedical Engr., Frontiers in Biomedical Engineering, J. Goh and A. Nather, eds., Dec. 2-4, 1992, Singapore, pp 414-416.
76. J.A. Davidson, R.A. Poggie, A.K. Mishra, A.Salehi and M.E. Harbaugh, "Increased Wear and Contact Stress from Increased Polyethylene Stiffness in Prosthetic Knee and Hip Articulation", Proc. of the 7th Intl. Conf. on Biomedical Engr., Frontiers in Biomedical Engineering, J. Goh and A. Nather, eds., Dec. 2-4, 1992, Singapore, pp 152-154.
77. R.A. Poggie, A.K. Mishra, J.A. Davidson, and J.J. Wert, "Friction and Wear Behavior of Nitrogen Ion Implanted Co-Cr-Mo Alloy Sliding Against UHMWPE Under the Reciprocating, Plowing Motion of the Prosthetic Knee", presented & published, TMS Fall Meeting, Surface Modification Technologies VI, November, 1992, Chicago, IL, TMS pub., Editors: T.S. Sudarshan and J.F. Braza, pp. 323-344.
78. J.A. Davidson, A.K. Mishra and R.A. Poggie, "Surface Hardened (ZrO<sub>2</sub>) Zirconium Alloy as an Orthopaedic Implant Bearing Surface", 4th World Biomaterials Congress, Berlin, April 24-28, 1992, pp 12.

79. J.A. Davidson, A.K. Mishra, R.A. Poggie and J.J. Wert, "Sliding Friction and Wear Comparison Between Cobalt Alloy and Zirconia Surfaces", Proc., 38th Meeting, ORS, Washington, DC, Feb. 17-20, 1992, pp 404.

### **CONFERENCE PRESENTATIONS AND CORPORATE SPONSORED MEDICAL EDUCATION**

1. RA Poggie – Lecturer at NextStep Arthropedix surgeon meetings; sales training and education of sales people and distributors. Topics include biomaterials applied to TJR and orthopedic devices; UHMWPE applied to hips and knees in the 2010s; MACC / taper fretting. 2014 to the present.
2. RA Poggie – Lecturer at Bodycad surgeon meetings; sales training and education of sales people. Topics include biomaterials, UHMWPE, patient specific technology, fixation of implants to bone.
3. RA Poggie, "Regeneration of the ACL in an Ovine Model Using a Resorbable Polymer Scaffold", 11<sup>th</sup> Annual Research Day, Sherbrooke Orthopaedic Residency Program, University of Sherbrooke Invited Lecture, October 21<sup>st</sup>, 2011.
4. RA Poggie, "Development and Characterization of Surface Modified PEEK for Bone-Contacting Applications", 11<sup>th</sup> Annual Research Day, Sherbrooke Orthopaedic Residency Program, University of Sherbrooke Invited Lecture, October 21<sup>st</sup>, 2011.
5. RA Poggie, "Trabecular Metal, Is It Safe?" and "Non-Reconstructive Applications of Trabecular Metal Technology", Zimmer Medical Education Event, Palm Springs, CA, December 1, 2006.
6. RA Poggie, "Trabecular Metal Technology in Revision and Primary Hip Arthroplasty", keynote lecture to the Italian Hip Society, Annual Meeting of the Italian Orthopaedic Association, November 12, 2006.
7. RA Poggie, chairman and faculty member, Zimmer-sponsored Medical Education on Trabecular Metal Technology, Materials Science, Biomechanics and Clinical Results with Primary and Revision Reconstructive Products, October 7, 2005, May 12 and November 3 2007, Z-TMT, Parsippany, New Jersey.
8. RA Poggie, faculty member, Zimmer sponsored "Natural-Knee MIS European Kick-Off Meeting", topics: *Trabecular Metal in Salvage & Revision Knee Surgery* and *Treatment Options for the Bone-Deficient Patella*, Kiel, Germany, June 9, 2005.
9. RA Poggie, faculty member, Zimmer sponsored Hip Masters Class, Madrid, Spain, April 6 & 7, 2005. Trabecular Metal Technology, TMT in primary and revision Acetabular Reconstruction, Design Rationale and Clinical Results.
10. RA Poggie – Trabecular Metal Technology – Properties, Osteointegration and Clinical Results, Zimmer sponsored New Technologies meeting, Copenhagen, Denmark, March 10, 2005.
11. RA Poggie and RD Coutts, "Clinical and Biomechanical Evaluation of a Ceramic Bearing Acetabular Cup", the 7<sup>th</sup> Annual Conference on Alternative Bearings, hosted by the University of Pennsylvania, October 14 & 15, 2004, Philadelphia, PA.
12. RA Poggie – Faculty Member, Zimmer sponsored Southampton Masters Class, Developments in Revision and Primary Knee Arthroplasty, directed by Drs Jeremy Martindale and David Barrett, MD, November 17-18, 2004. Presentations – "What is Trabecular Metal", "Patella Revision Options", and "Experience with TMT Tibial Trays".

13. RA Poggie – Faculty Member, Porous Tantalum Biomaterial: Science and Applications, 2003. Continuing Medical Education, Healthstream, funded by Zimmer Inc.
14. RA Poggie, “Trabecular Metal in Total Joint Replacement”, Chirurgia Protesica: Tradizione – Innovazione’ (2-day conference held every 2 years at the University of Milan); December 12 - 13, 2002, Milan, Italy.
15. RA Poggie, “Trabecular Metal Reconstructive Implants – Technology and Clinical Applications”, presentation to surgeons from Amsterdam & Rotterdam, the Netherlands, December 11, 2002.
16. RA Poggie, “Trabecular Metal Technology and Reconstructive Implants – Biomechanical Analyses and Clinical Results”, presentation to surgeons from Quebec province (22 attendees), October 16, 2002, Quebec, Canada.
17. R. Poggie, "The Research & Clinical Applications of Hedrocel Trabecular Metal", orthopaedic residents conference, Univ. of Pittsburgh, September 13, 2000.
18. R. Poggie and S. Nasser, “Polyethylene: Clinical & Laboratory Performance and Fabrication Parameters That Affect Quality”, Grand Rounds, McLaren Regional Medical Center, Flint, MI, June 7, 2000.
19. R. Poggie and S. Nasser, “The Research & Clinical Applications of Hedrocel Trabecular Metal”, local meeting of orthopaedic surgeons & residents, Flint, MI, June 5, 2000.
20. R Poggie, “Polyethylene – Current Issues”, presented at the Southern Orthopaedic Association Meeting, November 12<sup>th</sup>, 1999, Dallas, TX.
21. R Poggie, “Hedrocel Materials Technology and a Novel Mono-block Acetabular Cup” Campbell Clinic Orthopaedic Surgeon Conference, Memphis, TN, May 24<sup>th</sup>, 1999.
22. R. Poggie, “A Novel Mono-block Acetabular Cup and Polyethylene Quality Issues” University of Kentucky Grand Rounds, April 20, 1999.
23. R.A. Poggie, “Polyethylene Wear Concepts”, 22<sup>nd</sup> Annual Meeting of the American Society of Orthopaedic Physician’s Assistants, July 29-31, 1999, Minneapolis, MN.
24. K.R. St. John, R.A. Poggie, L.D. Zardiackas, “Comparison of Two Cobalt-Based Alloys for Metal-On-Metal Hip Bearings: The Relationship Between Hardness and Pin-On-Disc Wear”, presented at the November 1998 ASTM Symposium on Cobalt Base Alloys.
25. Robert Poggie, Richard Afflitto, Robert Averill, Sam Nasser, “Measurement of the Primary Consolidation and Associated Oxidation Resistance of Several Types of Polyethylene”, the 10<sup>th</sup> Annual Conference on Techniques and Science for Successful Joint Arthroplasty, October 8-9, 1998, Burlington, VT.
26. S. Nasser and R.A. Poggie, “The Effects of Resin Type, Consolidation Method, and Manufacturing Process on the Physical and Chemical Properties of UHMWPE”, presented at the 16<sup>th</sup> Annual Meeting of the Mid-America Orthopaedic Association, April 22-26, 1998, Acapulco, Mexico.
27. S. Nasser, R.A. Poggie, and R. Doane, “Retrieval and Finite Element Analysis of the Morse Taper Joint: Micromotion as a Function of Taper Diameter and Modular Head/Neck Function”, presented at the 16<sup>th</sup> Annual Meeting of the Mid-America Orthopaedic Association, April 22-26, 1998, Acapulco, Mexico.

28. R.A. Poggie, "Friction and Wear Behavior and Materials Properties of UHMWPE in Total Joint Replacements", Grand Rounds, Vanderbilt University Orthopaedic Dept., April 8<sup>th</sup>, 1997.
29. R.A. Poggie and P. Kovacs, "Electrochemical and Surface Characterization of Metallic Implant Materials", presented at the ASTM Workshop on Characterization and Performance of Articular Surfaces, Denver, CO, May 17, 1995.
30. R.A. Poggie, "Ceramic, Metallic, and Polymeric Bearing Surfaces: A Tribological Overview", presented at the ASTM Workshop on Characterization and Performance of Articular Surfaces, Denver, CO, May 17, 1995.
31. R.A. Poggie, Three orthopaedic surgeon conference presentations, 1996-1999, Univ. of Iowa.
32. R.A. Poggie, "Considerations in Developing an Apparatus and Protocol for Screening the Tribological Behavior of Orthopaedic Bearing Materials", presented at the NIST TJR Workshop, Gaithersburg, MD, March 30-31, 1995.
33. R.A. Poggie, "Chemical and Electrochemical Aspects of the Biocompatibility of Titanium and Its Alloys", presented at Symposium on Medical Applications of Titanium and Its Alloys: The Material and Biological Issues, Nov. 16, 1994, Phoenix, AZ, ASTM STP 1272, S. A. Brown and J. E. Lemons, Eds., American Society for Testing Materials, Philadelphia, PA, 1995.
34. R.A. Poggie, Invited Speaker, "Materials and Tribological Issues in Orthopaedic Bearings", The Memphis Society of Professional Engineers, Memphis, TN, Nov. 7, 1994.
35. R.A. Poggie, Invited Faculty Member, "The Benefit of Ceramic Bearing Surfaces in TJR", Continuing Orthopaedic Education, Australian Orthopaedic Association, Canberra, Australia, July 27 - 29, 1994.
36. R.A. Poggie, Invited Speaker, The Gordon Research Conference on Tribology, "Material and Surface Considerations in Orthopaedic Prostheses", Holderness School, Plymouth, New Hampshire, July 3-8, 1994.
37. R.A. Poggie, Invited Faculty, "Ceramic Bearing Surfaces: Their Role in THA", Fourth Annual Hips and Knees in the Keys, Dec. 10-11, 1993, Key Largo, FL.
38. R.A. Poggie, Invited Faculty Member, "Benefits of Ceramic Bearing Surfaces in Total Joint Replacement", 8th Annual joint Replacement Symposium, Nov. 10-13, 1993, Palm Beach, FL.
39. R.A. Poggie, Invited Lecture, "Materials in Total Joint Replacement", Cornell Univ., Ithaca, NY, Apr. 13, 1993.
40. A.K. Mishra, J.A. Davidson, P. Kovacs and R.A. Poggie, "Mechanical, Tribological and Electrochemical Evaluation of a New, Low Modulus Titanium (Ti-13Nb-13Zr) Alloy for Orthopaedic Implants, Proc. 12th So. Biomed. Engr. Conf., New Orleans, LA, Apr. 2-4, 1993.
41. R.A. Poggie, Invited Lecture, "Friction and Wear Issues in Total Joint Replacement", Quebec, PQ, Canada, Oct. 26, 1992.
42. R.A. Poggie, Invited Lecture, "Differences in Polyethylene Friction and Wear Behavior: Metals Versus Ceramics", Total Hips for the '90's, Halifax, Canada, Apr. 24-25, 1992.
43. R.A. Poggie, L.A. Harris and J.J. Wert, "An XPS Study of the Effects of Oxide and Compound Formation on the Adhesive Friction and Wear Behavior of Selected Solid Solution Aluminum Bronze Alloys", presented at ASM Internationals Materials Week-1991, October 21-24, 1991, Cincinnati, Ohio.