

Gerald T. Grant

Curriculum Vitae

CURRICULUM VITAE

I. PERSONAL DATA

Name - Gerald Thomas Grant DMD, MS, FACP, FAAMP

Current contact information: Maxillofacial Prosthodontist VAHCS 1101 Veteran's Drive
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Personal Statement — Innovation, Technology & Leadership

I am a maxillofacial prosthodontist whose career has consistently advanced the integration of digital technology, translational research, and interdisciplinary innovation in dentistry and craniofacial care. My work bridges clinical expertise with emerging technologies—digital imaging, virtual surgical planning, additive manufacturing, extended reality, and advanced materials—to create practical, high-value solutions in patient-specific design and complex reconstruction.

Across military, academic, and federal healthcare environments, I have led major digital dentistry and medical-technology initiatives, directed multidisciplinary innovation programs, contributed to national standards and regulatory discussions, and partnered with engineering teams to translate clinical needs into validated digital workflows and device development. My leadership roles reflect a sustained commitment to shaping future-focused clinical technologies, strengthening cross-functional collaboration, and guiding organizations toward more integrated, digitally enabled care.

I bring a track record of strategic innovation, credible technical leadership, and the ability to connect clinicians, researchers, and engineers around emerging opportunities that elevate both clinical outcomes and technological capability.

II. EDUCATION

1999 Certificate of Training — Maxillofacial Prosthetics Naval Dental School / National Naval Dental Center, Bethesda, Maryland

1995 Certificate of Training — Prosthodontics Naval Dental School / National Naval Dental Center, Bethesda, Maryland

1995 Masters of Science in Health Sciences George Washington University, School of Health Sciences, Washington, DC

1985 Doctor of Medical Dentistry University of Louisville, School of Dentistry, Louisville, Kentucky

1981 Bachelor of Arts Transylvania University, Lexington, Kentucky

III. EXPERIENCE WITH HIGHER EDUCATION

Positions and Academic Appointments

1985–2016 Employed as a Dental Officer, United States Navy

1985–1987 Dental Officer, Naval Support Activity, New Orleans, LA

1987–1990 Dental Officer, Naval Dental Center, Okinawa, Japan

1990–1993 Dental Officer, 2nd Dental Battalion, Camp Lejeune, NC

1993–1995 Residency, Prosthodontics — Naval Dental School, Bethesda, MD

1995–1998 Prosthodontics Instructor, Navy Advanced Education in General Dentistry program; Clinic Director, 2nd Dental Battalion/Naval Dental Clinic, Camp Lejeune, NC

1998–1999 Fellowship, Maxillofacial Prosthetics — Naval Dental School, Bethesda, MD

1999–2002 Staff, OMFS training program, Oral Maxillofacial Surgery Department, Naval Medical Center Portsmouth, Portsmouth, VA

2004–2009 Chairman, Department of Maxillofacial Prosthetics, Naval Postgraduate Dental School Instructor, Virginia Commonwealth University School of Dentistry Staff/Instructor, VA Hospital, Washington DC

2004–2011 Associate Professor of Health Care Sciences, The George Washington University School of Medicine and Health Sciences

2009–2010 Acting Chair, Research Department, Naval Postgraduate Dental School

2009–2015 Integrated 3-D Medical Applications Service Chief, Department of Radiology, Walter Reed Army Medical Center/National Naval Medical Center Staff/Instructor, VA Hospital, Washington DC — Prosthodontics Program

2010–2015 Associate Professor, Maxillofacial Prosthetics, Uniformed Services University of the Health Sciences (USUHS)

2013–2015 Adjunct Assistant Professor of Plastic Surgery, Johns Hopkins University

2014–2015 Bureau of Medicine (BUMED) subject matter expert on additive manufacturing and the use of digital design and manufacturing in medicine to the Navy

2015 Professor, Dentistry, Uniformed Services University of the Health Sciences Adjunct Professor, Department of Radiology, Uniformed Services University of the Health Sciences

2015–2017 Professor/term, Department of Oral Health and Rehabilitation, University of Louisville School of Dentistry Interim Chair, Oral Health and Rehabilitation Department, ULSD

2016–present Executive Committee of the Interdisciplinary Studies with Specialization in Translational Bioengineering (ISSTBE) Ph.D. Program University of Louisville Sustainability Committee Chairman: ULSD Executive Curriculum Steering Committee Chairman: ULSD Materials and Equipment Committee Chairman: ULSD Advanced Digital Dental Technology Committee

2017–2022 Interim Director, Advanced Program in Prosthodontics, ULSD

2018–2022 Assistant Dean of Technology and Innovation, ULSD Awarded Tenure, Professor — Department of Rehabilitative and Reconstructive Dentistry

2020–2022 Associate Director, Additive Manufacturing Institute of Science and Technology, Speed School of Engineering, University of Louisville

2022–present Director/Secretary, American Board of Prosthodontics Prosthodontist, Lexington VHS, Lexington, KY Adjunct Professor, ULSD, Prosthodontics

IV. PROFESSIONAL ACTIVITIES

Membership in Organizations

American College of Prosthodontics, Fellow 1993–present Immediate Past President 2023–2024 President 2022–2023 President Elect 2021–2022 Vice President 2020–2021 Digital Curriculum Development Team 2016–2021 Region 6 Director 2012–2015 Chair — Digital Dentistry Task Force 2013–2020 Chair — Digital Dentistry Glossary Task Force 2014–2020 Chair — Science and Technology Committee 2015–2017 Co-director, Digital Dental Curriculum Task Force 2016–2018 Maxillofacial Director, BOD 2018–2020 Chair — Digital Curriculum Working Group 2018–2020

Academy of Osseointegration 1993–2008

American Academy of Maxillofacial Prosthetics 2002–present President 2015–2016

American Dental Educators Association 2004–present

American Dental Association 1981–present

International College of Dentists, Fellow 2005–present

International Society for Maxillofacial Reconstruction 2009–present Chairman: Research Committee

International College of Prosthodontics, Fellow 2011–2012

Advanced Digital Technologies Foundation President 2017–2018 Secretary, North American Region 2010–2017 Board of Directors 2015–2017

Oral Presentations

International Programs

- "Maxillofacial Prosthetics, A Wartime Specialty," AMSUS meeting 2006, San Antonio, Texas.
- "Status of 3D Imaging in Medical/Dental Applications on Head and Neck Reconstruction," invited speaker, Institute for Reconstructive Sciences in Medicine, Misericordia Community Hospital, Edmonton, Alberta, Canada, July 13–16, 2009. [Invited]
- "Comparison of Cone Beam CT and Conventional CT in the Accuracy of Rapid Prototype Models," RAPID 2009 Conference, 12 May 2009, Schaumburg, IL, USA. [Invited]
- "Maxillofacial Prosthetic Support for the Wounded Warrior; Past, Present, and Future," International College of Dentists CE Conference, 19 Apr 2009, Baltimore, MD, USA. [Invited]
- "Digital Use of Craniofacial Imaging in Head and Neck Reconstruction," Advanced Dental Technologies Conference, Vale, CO, February 2010, USA.
- "3D Medical Applications in Combat Trauma Reconstruction," Navy Research Conference, Lansdowne, VA, Apr 7, 2010.
- "Use of 3D Imaging and Rapid Prototype Models in Your Everyday Practice," workshop, International Society for Maxillofacial Reconstruction Annual Meeting, Sestri Levante, Italy, May 24, 2010. [Invited]
- "Imaging and Scanning," Advanced Digital Technologies Conference, May 2011, Freiburg, Germany. [Invited]
- "Imaging, Modeling and Rapid Prototype Techniques in Craniofacial Reconstruction," 2nd Annual Navy Medicine Research Conference, 4–7 June 2011, Bethesda, MD, USA.
- "Accuracy of Rapid Prototype Models for Head and Neck Reconstruction" (for Capt Robert Taft), 2nd Annual Navy Medicine Research Conference, 4–7 June 2011, Bethesda, MD, USA.
- "Manufacturing Technology in Medicine and Dentistry," International College of Prosthodontists Conference, Kona, HI, 11 Sept 2011. [Invited]

- "Advancement and Use of Digital Techniques in Treatment of Wounded Warriors," American Academy of Maxillofacial Prosthetics Annual Meeting, Scottsdale, AZ, 1 Nov 2011. [Invited]
- "Use of 3D Software in Postgraduate Dental Education," Materialise World Conference, Leuven, Belgium, April 2012. [Invited]
- Solomon NP, Cord LL, Dietrich-Burns K, Dietsch AM, Lewis WJB, & **Grant GT**. (2013, Jan). Dysphagia in traumatically wounded or injured US military service members. 1st International Workshop on Biomechanical and Parametric Modeling of Human Anatomy, Vancouver, BC. [Invited]
- "Current Uses of Digital Models in Medicine," CE module on 3D Printing, RSNA Conference 2013, Chicago, IL, December 2, 2013. [Invited]
- "The Use of Additive Manufacturing in Wounded Warrior Care," Naval Additive Manufacturing Technology Interchange, Naval Surface Warfare Center, Carderock, West Bethesda, MD, February 26, 2014. [Invited]
- "Current State of 3D Medical Applications in Wounded Warrior Care," Conference on Structural Health and Monitoring of the Human Skeleton, Office of Naval Research, Arlington, VA, 23 Mar 2014. [Invited]
- "The Use of 3D Printing in Treatment and Restoration of the Head and Neck Cancer Patient," Oncologic Dentistry & Maxillofacial Prosthetics Symposium, MD Anderson, May 14–16, 2014. [Invited]
- "Use of Digital Technologies in Craniomaxillary Reconstructions" (joint lecture with Dr. Robert Taft), 2014 ISMR Xi'an Conference, Xi'an, China, 16 Sept 2014. [Invited]
- "Validation of Surgical Guides with Navigation in Face Transplant Surgery," keynote speaker, 2014 ADT Conference, Beijing, China, 6 Sept 2014. [Invited]
- "Techniques for Current 3D Printing Applications," Radiology Society of North America Annual Meeting, Chicago, IL, December 2014. [Invited]
- "Application of 3D Printing in Face Transplantation," Amir Imanzadeh, Peter Liacouras, **Gerald Grant**, et al., presented by Amir Imanzadeh, MD, to the Radiology Society of North America Annual Meeting, Chicago, IL, December 2014.
- "Use of Additive Manufacturing Technologies in Reconstruction," National Institute of Allergy and Infectious Diseases, NIH, Bioinformatics Festival, Rockville, MD, Jan 2015. [Invited]
- "Maxillofacial Prosthetics: Current Trends in the Use of Advanced Digital Technologies in Patient Care and Treatment," International College of Dentist Foundation CE Course, 2015. [Invited]
- "The Use of 3D Medical Applications in the Reconstruction of Wounded Warriors," Royal Canadian Dental Corps Centennial, Ottawa, Canada, May 2015. [Invited]
- "Computer-Assisted Single-Stage Cranioplasty," Ryan J. Murphy*, Kevin C. Wolfe, Peter C. Liacouras, Gerald T. Grant, Chad R. Gordon, Mehran Armand, 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Milan, Italy, 2015. [Invited]
- "Digital Design and 3D Printing Implantable Devices in Craniofacial Reconstruction of Wounded Warriors," Military Health Sciences Research Symposium, Ft. Lauderdale, FL, 17–21 August 2015. [Invited]

- "Using 3D Printing to Produce Custom Prosthetics for Improved Daily Function of Wounded Warriors," Military Health Sciences Research Symposium, Ft. Lauderdale, FL, 17–21 August 2015. [Invited]
- "History and Recent Developments in Maxillofacial Prosthetics," dual presentation with Dr. Robert Taft, American Academy of Maxillofacial Prosthetics Annual Meeting, Orlando, FL, 18 October 2015. [Invited]
- "Updates in the Use of Advanced Digital Technologies in Maxillofacial Prosthetics," dual presentation with Dr. Robert Taft, American College of Prosthodontists Annual Meeting, Orlando, FL, 21 October 2015. [Invited]
- "Techniques for Current 3D Printing Applications," RSNA Annual Meeting, Chicago, IL, Dec 2015. [Invited]
- Liacouras P, Grant G, Lichtenberger J, Ho V. "Using Computed Tomography and 3D Printing (Additive Manufacturing) to Aid Construction of Custom Prosthetics and Attachment Devices for Our Wounded Warriors," SSE13-01, RSNA Annual Meeting, Chicago, IL, Dec 2015. [Invited]
- "Medical Imaging and Additive Manufacturing Considerations in the Design of Surgical Guides and Medical Devices," International Congress of Oral Implantologists Winter Symposium, Miami, FL, Feb 2016. [Invited]
- "Digital Imaging, Design and AM in Custom Patient Care," Karles Invitational Conference on Additive Manufacturing, Navy Research Laboratory, Washington, DC, August 9–11, 2016. [Invited]
- "Techniques for Current 3D Printing Applications," RSNA Annual Meeting, Chicago, IL, Dec 2016. [Invited]
- "Use of Digital Technologies in Face Transplantation," invited workshop, Advanced Digital Technologies Foundation Triannual Meeting, Amiens, France, May 2017. [Invited]
- "3D Printing and Material Advances in Medical Modeling," Advanced Digital Technologies Foundation Triannual Meeting, Amiens, France, May 2017. [Invited]
- "Donor/Recipient Surgical Planning, Guide Fabrication, and Donor Mask Fabrication Considerations in Facial Alloplastic Composite Transplants," University of Alberta, Canada, in conjunction with their symposium on development of their Facial Alloplastic Composite Team, June 28, 2017. [Invited]
- "Digital Manufacturing: A Revolution for Medicine and Dentistry in Customized Patient Care," International Forum on Innovation and Emergent Industry Development, Shanghai, China, November 8, 2017. [Invited]
- "Use of 3D Printing in Medicine and Dentistry," CAMBRA Meeting, University of North Carolina, 12 April 2018. [Invited]
- "Futuristic Applications of 3D Printing for Neuro-Cranial Reconstruction," 4th International Hopkins-Harvard Neuroplastic Surgery Symposium, Nov 3–4, 2018, Baltimore, MD, Johns Hopkins. [Invited]

National and State Programs

- "Fabrication and Failure Behavior of an All-Ceramic FPD Test Analog," oral presentation, American Association for Dental Research, San Antonio, Texas, 1994.

- "Fabrication and Failure Behavior of an All-Ceramic FPD Test Analog," American College of Prosthodontics Annual Meeting, Washington, DC, 1995.
- "Failure Behavior of Human Cranial Bone and Developmental Calcium Phosphate Implants," International Academy of Dental Research, Washington, DC, 05–08 April 2000.
- "Board Review of the Restoration of Partially and Fully Edentulous Patients," Academy of General Dentistry Annual Meeting, Washington, DC, 2005. [Invited]
- "Maxillofacial Prosthetics, A Wartime Specialty," Annual Meeting of the American Academy of Maxillofacial Prosthetics, 2005, Los Angeles, CA. [Invited]
- "Stereolithography in the Restoration of Head and Neck Injuries," Neurotrauma Course, National Naval Medical Center, Bethesda, MD, Aug 11–12, 2007.
- "3D Imaging and CAD/CAM Fabrication for Craniofacial Reconstruction," Advanced Technology Application in Combat Casualty Care Conference, St. Pete, FL, 19 August 2008. [Invited]
- "3D Imaging and CAD/CAM Fabrication for Dental Rehabilitation," Maryland State Chapter of the American College of Prosthodontists, 17 September 2008.
- Ernie Jones Lecture Series: "Maxillofacial Prosthetic Support for the Wounded Warrior; Past, Present, and Future" (joint lecture with Dr. Robert Taft), University of Washington School of Dentistry, 25 March 2011. [Invited]
- "The Use of Advanced Digital Technologies in the Treatment of Head and Neck Cancer Patients," University of Alabama, Birmingham School of Dentistry, August 26, 2010. [Invited]
- "Use of Additive Manufacturing in the Reconstruction of Wounded Warriors," American Institute of Engineers Symposium on 3D Printing for Government and Defense, Oct 21–22, 2014.
- "Future of Military Medicine," military discussion section, Chicago Ideas Week, Oct 13, 2014, Chicago, IL. [Invited]
- "Leveraging Digital Dentistry in the Lab," ACP Digital Dentistry Symposium, Feb 23–24, 2015, Chicago, IL. [Invited]
- Schroeder JW, Liacouras PC, Grant GT, Ho VB. "Current Applications for 3D Printing (Additive Manufacturing): An Overview in a Radiology Practice." American Society of Neuroradiology 53rd Annual Meeting & the Foundation of the ASNR Symposium, Chicago, IL, April 2015.
- "The Use of Advanced Digital Technologies: Digital Workflow in Facial/Dental Reconstructions," Contra Costa Dental Society Meeting, San Francisco, Sept 25, 2015 (7 CE credits). [Invited]
- "Finally — I Can Put ADT in My Medical/Dental Practice," Advanced Digital Technologies, North American Region Conference, June 16–18, 2016.
- "Technology Advances in MFP," Dr. Laney Maxillofacial Prosthetics Symposium, Mayo Clinic, Rochester, MN, August 6, 2016. [Invited]
- "The Digital Thread," Annual Meeting of the Academy of Fixed Prosthodontics, Chicago, IL, Feb 25, 2017. [Invited]
- "Digital Dentistry in Postgraduate Education," American College of Prosthodontics Annual Education Conference, San Francisco, Nov 1, 2017.
- "Use of Digital Techniques in Dentistry," Chicago Dental Society Meeting, Chicago, 2018. [Invited]

- "Integrating Implant Placement in Advanced Education in Prosthodontics Programs," American College of Prosthodontics Annual Educational Conference, Baltimore, MD, 2018.
- "AM Technology, Changing the Face of Medical/Dental Education and Patient Care," AMERIMOLD Conference, Chicago, IL, 2019. [Keynote speaker]
- "Digital Design and 3D Printing — The Future of Dentistry," ASTM International Conference on Advanced Manufacturing (ICAM 2024), Atlanta, GA, Oct 10, 2024. [Invited Keynote]
- "RPD Design and Fabrication," VA Dental Continuing Education webinar, Jan 3, 2024. [Invited]

Local Programs

- "Prosthodontics Repairs," presented to Naval School of Dentistry Prosthodontics Short Course, Bethesda, Maryland, 1994 and 1999.
- "Influence of the Dura Mater on Static Displacement and Failure Behavior of Human Cranial Bone," research presentation, Naval Postgraduate Dental School, Bethesda, MD, 1999.
- "Oral Treatment of Head and Neck Cancer Patients with Radiation Treatment," Medical College of Virginia, Norfolk, VA, 2000.
- "Implant Diagnosis and Treatment Planning," Annual Meeting, Tidewater Dental Association, Norfolk, VA, 2000.
- "Restorative Treatment of the Irradiated Patient," Annual Meeting, Tidewater Dental Association, Norfolk, VA, 2001.
- "Maxillofacial Prosthetics in the GWOT," District of Columbia Dental Society Meeting, 2005.
- "Restoration of Craniofacial Combat Injuries," Southern Maryland Dental Association, September 2007.
- "Maxillofacial Prosthetics and Restoration of Head and Neck Trauma," Tri-Service Dental Meeting, March 17, 2008, Norfolk, VA.
- "Treatment Planning for Removable Prosthetics," Removable Prosthetics Short Course, Navy Medicine West, San Diego, CA, March 20, 2008.
- "Review of Maxillofacial Prosthetics and New Technology," Naval Medical Center, Annapolis, MD, 5 March 2009.
- Short Course for Basic Dental Implants, Navy Medicine West, San Diego, CA, Oct 6–9, 2008.
- Short Course for Basic Dental Implants, Navy Medicine West, San Diego, CA, Oct 5–8, 2009.
- "Cone Beam CT, the Good, the Bad, and the Ugly," Service Dental Meeting, March 17, 2008, Norfolk, VA, and General Dentistry Short Course, May 3, 2010.
- "Facial Reconstruction Guided by 3D Techniques," provider off-site training, Naval Health Clinic Quantico, 10 March 2011.
- "Advanced Digital Technologies in Medicine and Dentistry," local ITI chapter meeting, Lexington, KY, 12 Nov 2015. [Invited]
- "The Digital Thread" — 3 hours CE, Kentucky Dental Association Meeting, August 2017. [Invited]

- "Impact and Development of Digital Technologies on Dentistry," Bluegrass Dental Association Meeting, Sept 2018. [Invited]
- "Have We Gone Digital?" Louisville Dental Society Meeting, Feb 2019.
- "3D Printing in My Office: What Do I Need to Know?" Digital Dentistry Conference, sponsored by Whip Mix Corp, Louisville, KY, Sept 15, 2024.

Naval Postgraduate Continuing Education Short Courses:

2004: "Dental Implants, Board Review," OMFS board prep course; "Diagnosis and Treatment Planning for Dental Implants," Prosthodontics Short Course; "Diagnosis and Treatment of the Single Tooth Dental Implant Restoration," Comprehensive Dentistry Short Course/General Dentistry Short Course

2005: (same course set as above)

2006: (same course set as above)

2007: (same course set as above)

2008: "Dental Implant, Board Review," OMFS board prep course; "Diagnosis and Treatment of the Single Tooth Dental Implant Restoration," Comprehensive Dentistry Short Course/General Dentistry Short Course

2009: (same course set as 2008)

2012–2015: "Advanced Digital Techniques in Dentistry," CAD/CAM Short Course, Naval Postgraduate Dental School

Other CE Courses:

- "Digital RPD Design and Fabrication," University of Louisville School of Dentistry, June 13, 2017.
- "Choosing the Right 3D Printer for In-Office Use," University of Louisville School of Dentistry, Nov 2020.

ULSD Course Director:

Advanced Concepts in Dentistry I 2015–2017 Advanced Concepts in Dentistry II 2015–2017
Basic Dental Implants 2015–2017 Advanced Dental Implants 2016–2017 Basic Concepts of Removable Partial Dentures 2017–2018 Advanced Education in Prosthodontics 2018–2022

Table Clinics / Poster Presentations

- "Fabrication of RPD Guide Plane/Clasps Assembly for Survey Crown Replacement," presented at the American College of Prosthodontics Annual Meeting, New Orleans, LA, 1993, and at the 1994 Annual Triservice Dental Meeting, Fort Meade, MD.

- "Practical Application of Velcro and Polyurethane in Maxillofacial Prostheses," presented at the 1998 American College of Maxillofacial Prosthetics Annual Meeting, Victoria, British Columbia, Canada.
- "Practical Application of Velcro and Polyurethane in Maxillofacial Prostheses," poster presentation, 1999 Annual Triservice Dental Meeting, US Naval Academy, Annapolis, MD.
- "Uses of a Vacuum-Formed Material for the Maxillectomy Patient," poster presentation, Annual Meeting of the Academy of Maxillofacial Prosthetics 2004, Ontario, Canada.
- "Digital Image Capture and Rapid Prototyping of the Maxillofacial Defect," poster presentation, Annual Meeting of the Academy of Maxillofacial Prosthetics 2007, Scottsdale, AZ.
- "Strength/Work-to-Fracture of a Bioactive Calcium Phosphate Cement," poster presentation, Annual Meeting of the Academy of Maxillofacial Prosthetics 2007, Scottsdale, AZ.
- "Auricular Prosthetic Design and Manufacturing Using Computed Tomography, 3D Photographic Imaging and Rapid Prototyping," Meeting of the Academy of Maxillofacial Prosthetics 2009, San Diego, CA.
- "Craniofacial Imaging and Development of a Craniofacial Imaging Database," USMC Medical Research Meeting, 2012, Washington, DC.
- Kondor S, **Grant G**, Liacouras P, Schmidt J, Parsons M, Rastogi V, Smith L, Macy B, Sabart B, Macedonia C. "On Demand Additive Manufacturing of a Basic Surgical Kit," American Society of Manufacturing Engineers Design of Medical Devices Conference, Minneapolis, MN, April 2013.
- Kondor S, **Grant G**, Liacouras P, Schmidt J, Parsons M, Smith L, Macy B, Sabart B, Macedonia C. "Personalized Surgical Instruments," American Society of Manufacturing Engineers Design of Medical Devices Conference, Minneapolis, MN, April 2013.
- Rastogi V, Smith L, Schmid J, Parsons M, **Grant G**, Kondor S, Macedonia C. "A Novel Approach for Assured Sterility of Medical Devices," American Society of Manufacturing Engineers Design of Medical Devices Conference, Minneapolis, MN, April 2013.
- J. Marshal Green III DDS, Edward Wise DMD, Sarah Lawson DDS, Peter Liacouras PhD, Michael Gentile DMD, **Gerald T. Grant DMD, MS**. "The Use of Custom 3D Anatomical Spacers in Maxillofacial Resection and Reconstruction of the Temporomandibular Joint," 95th AAMOS Annual Meeting, Orlando, FL, Oct 2013.
- Edward W. Swanson MD, Mohammed Al Rakan MD, Srinivas M. Susarla MD DMD MPH, Erin Rada MD, Devin Coon MD, Gabriel F. Santiago MD, Jaimie T. Shores MD, Steven C. Bonawitz MD, Elliot K. Fishman MD, Ryan Murphy MS, Mehran Armand PhD, Peter Liacouras PhD, **Gerald T. Grant DMD, MS**, Gerald Brandacher MD, W.P. Andrew Lee MD, Chad R. Gordon DO. "Complex Surgical Cutting Guides for Le Fort-Based, Maxillofacial Transplantation Developed through Pre-Clinical, Orthotopic Swine Transplants and Human Cadaver Surgeries: An Academic Scholar Update," American Association of Plastic Surgeons 93rd Annual Meeting, April 5–8, 2014.
- **Grant GT**, Liacouras PC, Murphy R, Gordon CR, Armand M. "Planning Complex Surgical Cutting Guides for Le Fort-Based Maxillofacial Transplantation," Annual Meeting of the Radiology Society of North America, Nov 30–Dec 5, 2014, Chicago, IL.

- Imanzadeh A, Rybicki F, Mitsouras D, Stegner M, Liacouras P, **Grant G**. "Fundamentals and Applications of 3D Printing in Medicine," RSNA Annual Meeting, Chicago, IL, Dec 2014.
- Liacouras P, **Grant G**, Ho V. "Creation of Custom Cranial Implant for Wounded Warriors Using Digital Technologies and Additive Manufacturing," RSNA Annual Meeting, Chicago, IL, Dec 2014.
- Mitsouras D, Schultz K, Rybicki F, **Grant G**. "A Four-Dimensional Segmentation Algorithm for Accurate Reproduction of 3D-Printed Coronary Arteries from Clinical Coronary CT Angiography," RSNA Annual Meeting, Chicago, IL, Dec 2014.
- Murphy RJ, Wolfe KC, Liacouras PC, **Grant GT**, Gordon CR, Armand M. "Computer-Assisted Single-Stage Cranioplasty," poster presentation, 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Venice, Italy.
- Mitsouras D, Cai T, Liacouras P, Ripley B, **Grant G**, Rybicki F. "Novel Quality Metrics Toward Establishing the Accuracy of 3D-Printed Medical Models," IN109-ED-X, RSNA Annual Meeting, Chicago, IL, Dec 2015.
- Liacouras PC, Murphy R, Armand M, **Grant GT**, Gordon C. "Custom, 3D Printed, Navigationally Trackable, Cutting Guides for Face Transplant Surgeries," RAPID Annual Conference, Orlando, FL, May 16–19, 2016.
- Ho VB, Ringeisen BR, Blaize-Wise KA, Pirlo RK, Lichtenberger JP, **Grant GT**. "4D Bio3: A Department of Defense Bioprinting Consortium," RSNA Annual Meeting, Chicago, IL, Dec 2015.
- Mukherjee E, Mohandesi J, Lindman M, **Grant G**. "Prosthodontic Management of Esthetic Implant Complication: Case Report," American College of Prosthodontics On-line Annual Meeting, Nov 2021.
- Ren Y, Kulkarni P, Kulkarni PS, **Grant G**. "A Digital Workflow for Designing a Crown Lengthening Surgical Guide for a Full Mouth Rehabilitation," American College of Prosthodontics Annual Virtual Meeting, Nov 2021.
- Mukherjee E, Malone L, Tackett E, Gunaratnam B, **Grant G**. "Quality Control of In-Office 3D Printers," Regional AADR, Lexington, KY, Sept 2021.
- Ren Y, **Grant GT**. "Digital Workflow for Maxillary and Mandibular Fully Guided Implant Placement for Fixed Complete Denture," Boucher Dental Conference, Apr 2022.

Publications

- **Grant GT**, Kelly JR. Fabrication and failure behavior of an all-ceramic FPD test analog. J Dent Res, Jan 1995;74:160.
- **Grant GT**, Kelly R. Failure behavior of human cranial bone and developmental calcium phosphate implants. J Dent Res 79, Special issue, 2000. Abstract #100.
- **Grant GT**, Taft RM, Wheeler ST. Practical application of Velcro and polyurethane in maxillofacial prostheses. J Prosthet Dent, March 2001;85(3):281–283.
- Alfano SG, **Grant GT**, et al. Uses of a vacuum-formed material for the maxillectomy patient. J Fac Somato Pros, fall 2003;9(2):93–98.
- Brett-Major D, Baraniak S, Gilhooly J, Christensen R, **Grant G**, Armonda R, Ganesan A. Foreign body reaction mimicking post-neurosurgical infection following cranioplasty. Military Medicine 2008;173(7):697–699.

- **Grant GT.** Accuracy of rapid prototype 3D medical models from conventional and cone beam CT images. Abstract ID#143703.
- Liacouras P, Garnes J, Roman R, **Grant GT.** Auricular prosthetic design and manufacturing using computed tomography, 3D photographic imaging and rapid prototyping. *J Prosthet Dent*, Feb 2011;105(2):80–82.
- Sabol J, **Grant GT.** Digital image capture and rapid prototyping of the maxillofacial defect. *J Prosthodont* 2011 Jun;20(4):310–314.
- Taft R, Kondor S, **Grant G.** Accuracy of rapid prototype models for head and neck reconstruction. *J Prosthet Dent* 2011 Dec;106(6):399–408.
- Taft R, Kondor S, **Grant G.** Accuracy of rapid prototype models for head and neck reconstruction: model accuracy. *J Healthcare, Science, and the Humanities* 2011;1(4):22,111.
- **Grant GT,** Kondor S, Taft R. Comparison of CBCT and CT in accuracy of rapid prototype models: image registration. *J Healthcare, Science, and the Humanities* 2011;1(4):128.
- Kondor S, **Grant G,** Liacouras P, Schmidt J, Parsons M, Rastogi V, Smith L, Macy B, Sabart B, Macedonia C. On demand additive manufacturing of a basic surgical kit. *J Med Devices* 2013;7(3):030916.
- Kondor S, **Grant G,** Liacouras P, Schmidt J, Parsons M, Smith L, Macy B, Sabart B, Macedonia C. Personalized surgical instruments. *J Med Devices* 2013;7(3):030934.
- Rastogi V, Smith L, Schmid J, Parsons M, **Grant G,** Kondor S, Macedonia C. A novel approach for assured sterility of medical devices. *J Med Devices* 2013;7(3):030947.
- CD-based Maxillofacial Prosthetics Laboratory Manual for Navy Maxillofacial Departments.
- Gordon CR, Swanson EW, Susarla SM, Coon D, Rada E, Al Rakan M, Santiago GF, Shores JT, Bonawitz SC, Fishman E, Murphy R, Armand M, Liacouras P, **Grant GT,** Brandacher G, Lee WPA. Overcoming cross-gender differences and challenges in Le Fort-based, craniomaxillofacial transplantation with enhanced computer-assisted technology. *Ann Plast Surg* 2013 Oct;71(4):421–428.
- Santiago G, Murphy RJ, Coon D, Otake Y, Basafa E, Al Rakan M, Rada E, Susarla S, Swanson E, Fishman E, Brandacher G, Lee WPA, Liacouras P, **Grant G,** Armand M, Gordon CR. Establishing cephalometric landmarks for the translational study of Le Fort-based facial transplantation in swine: enhanced applications using computer-assisted surgery and custom cutting guides. *Plast Reconstr Surg* 2014;133(5):1138–1151.
- Gordon CR, Murphy RJ, Coon D, Otake Y, Basafa E, Al Rakan M, Rada E, Susarla S, Swanson E, Fishman E, Santiago G, Brandacher G, Lee WPA, Liacouras P, **Grant G,** Armand M. Preliminary development of a workstation for craniomaxillofacial surgical procedures — introducing a Computer-Assisted Planning and Execution (CAPE) system. *J Craniofac Surg* 2014;25(1):273–283.
- Al-Rakan M, Shores JT, Bonawitz S, Santiago G, Christensen JM, **Grant G,** Murphy RJ, Basafa E, Armand M, Otovic P, Eller S, Brandacher G, Gordon CR. Ancillary procedures necessary for translational research in experimental craniomaxillofacial surgery. *J Craniofac Surg* 2014;25(6):2043–2050.
- **Grant GT,** Liacouras P, Santiago G, Garcia JR, Al Rakan M, Murphy R, Armand M, Gordon CR. Restoration of the donor face after facial allotransplantation: digital manufacturing techniques. *Ann Plast Surg* 2014;72(6):720–724.

- Imanzadeh A, Kumamaru KK, Wake N, Mitsouras D, **Grant GT**, Liacouras P, George E, Pomahac B, Caterson EJ, Rybicki FJ. Application of 3D printing in face transplantation. Radiological Society of North America (RSNA) 2014, Chicago, IL, USA.
- **Grant GT**, Liacouras P, Aitaholmes C, Garnes J, Wilson WO. Digital capture, design, and manufacturing of a facial prosthesis: a clinical report of a pediatric patient. *J Prosthet Dent* 2015 Jul;114(1):138–141.
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- Murphy RJ, Basafa E, Hashemi S, **Grant GT**, Liacouras PC, Susarla S, Otake Y, Santiago G, Armand M, Gordon CR. Optimizing hybrid occlusion in face-jaw-teeth transplantation: a preliminary assessment of real-time cephalometry as part of the Computer-Assisted Planning and Execution (CAPE) workstation for craniomaxillofacial surgery. *Plast Reconstr Surg* 2015 Aug;136(2):350–362.
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- Murphy RJ, Wolfe KC, Liacouras PC, **Grant GT**, Gordon CR, Armand M. Computer-assisted single-stage cranioplasty. In: 2015 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), 2015 Aug 25:4910–4913. IEEE.
- Gordon CR, Murphy RJ, **Grant GT**, Armand M. Commentary on "A multicenter experience with image-guided surgical navigation: broadening clinical indications in complex craniomaxillofacial surgery." *J Craniofac Surg* 2015;26(4):1140–1142.
- Connors CA, Liacouras PC, **Grant GT**. Custom Titanium Ridge Augmentation Matrix (CTRAM): a case report. *Int J Periodontics Restorative Dent* 2016;36(5):707.
- Murphy RJ, Liacouras PC, **Grant GT**, Wolfe KC, Armand M, Gordon CR. A craniomaxillofacial surgical assistance workstation for enhanced single-stage reconstruction using patient-specific implants. *J Craniofac Surg* 2016 Nov;27(8):2025–2030.

- Arunyanak S, Harris B, **Grant G**, Lin WS. Digital approach to planning computer-guided surgery and immediate provisionalization in a partially edentulous patient. *J Prosthet Dent* 2016 Feb;116(1).
- Hashemi S, Armand M, Gordon CR. Development and refinement of computer-assisted planning and execution system for use in face-jaw-teeth transplantation to improve skeletal and dento-occlusal outcomes. *Curr Opin Organ Transplant* 2016 Aug 11. [Epub ahead of print] [Acknowledgement section notes additional co-authors: Murphy, **Grant**, Wolfe, and Liacouras.]
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- **Grant GT**, Campbell SD, Masri RM, Andersen MR, and The American College of Prosthodontists Digital Dentistry Glossary Development Task Force. Glossary of digital dental terms. *J Prosthodont* 2016;25:S2–S9. DOI:10.1111/jopr.12532.
- Doll JK, Barndt P, Grant G. The dentoalveolar prosthesis: a novel approach in the reconstruction of hard and soft tissue deficiencies. *J Prosthodont* 2018 Jul;27(6):544–549.
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- Katkar RA, Taft RM, **Grant GT**. 3D volume rendering and 3D printing (additive manufacturing). *Dent Clin North Am* 2018 Jul;62(3):393–402.
- Shaikh MQ, Nath SD, Akilan AA, Khanjar S, Balla VK, **Grant GT**, Atre SV. Investigation of patient-specific maxillofacial implant manufacturing by metal fused filament fabrication (MF3) of Ti-6Al-4V. *Dent J* 2021;9(10):109.
- Arnold FW, **Grant GT**, Bressoud PF, et al. A comparison efficacy study of commercial nasopharyngeal swabs versus a novel 3D-printed swab for detection of SARS-CoV-2. *Univ Louisville J Respir Infect* 2020;4(1):Article 41.
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- Wolfaardt J, Brecht L, Taft R, **Grant G**. The future of maxillofacial prosthodontics in North America: the role of advanced digital technology and artificial intelligence — a discussion document. *J Prosthet Dent*, May 2024.

Book Chapters

- Grant GT, Liacouras P, Kondor S. Maxillofacial imaging in the trauma patient. *Atlas Oral Maxillofac Surg Clin North Am* 2013 Mar 1;21(1):25–36.
- Masri R, Driscoll C. Clinical Applications of Digital Dental Technology, Chapter 3, "Direct Digital Manufacturing." June 2015, Wiley-Blackwell.
- Scarfe WD, Angelopoulos C. Maxillofacial Cone Beam Computed Tomography: Principles, Techniques and Clinical Applications, Chapter 31, "CBCT and Additive Manufacturing." Springer, Berlin. ISBN: 354049359X.
- Greenburg S. Digital Technologies for Craniomaxillofacial Surgery, Chapter 3, "Craniomaxillary Reconstructions Based on 3D Modeling," pp. 55–65. Springer, Berlin. ISBN: 9781493915316.

- Masri R, Driscoll C. Clinical Applications of Digital Dental Technology, Chapter 3, "Direct Digital Manufacturing." February 2023, Wiley-Blackwell. <https://doi.org/10.1002/9781119800613.ch3>
- Coburn JC, **Grant GT**. FDA regulatory pathways and technical considerations for the 3D printing of medical models and devices. In: 3D Printing at Hospitals and Medical Centers, 2nd ed. Springer International Publishing, 2024.
- Seelaus R, **Grant GT**. 3D printing and digital design for maxillofacial prosthetics. In: 3D Printing at Hospitals and Medical Centers, 2nd ed. Springer International Publishing, 2024.

Books Published

- Rybicki FJ, **Grant GT**. 3D Printing in Medicine. Cham: Springer International Publishing, 2017.
- Rybicki FJ, Morris JC, **Grant GT**. 3D Printing at Hospitals and Medical Centers, 2nd ed. Springer International Publishing, 2024.

Publication Reviewer / Editorial Board

- Journal of 3D Printing in Medicine (Springer) — Associate Editor
- Stem Cell — Fundamentals and Practice (editorial board)
- Journal of Otolaryngology — Head & Neck Surgery (editorial board)
- Journal of Dentistry and Oral Biology (editorial board)
- Bentham Science Publishers e-books (reviewer)
- Journal of Technology Transfer (Springer) (reviewer)
- Journal of Cranio-Maxillofacial Surgery (reviewer)
- Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology (reviewer)
- Medical Engineering and Physics (Elsevier) (reviewer)
- Journal of Prosthetic Dentistry (reviewer)
- Military Medicine (reviewer)
- Journal of Biomedical Materials Research (reviewer)
- Rapid Prototyping Journal (reviewer)

Boards and Panels

- FDA Additive Manufacturing Workshop, subject matter expert panel, Oct 8–9, 2014, Silver Spring, MD.
- Government Accountability Office (GAO) Forum on Additive Manufacturing, Oct 15–16, 2014, Washington, DC.
- N415/SECNAV Task Force on Navy Additive Manufacturing Implementation, 14 Apr 2015, Gaylord Hotel.
- Consultant, NIH 3D Print Exchange.
- Consultant, FDA science division for Additive Manufacturing in Medical/Dental Devices.
- Invited participant, ASPSM: Expeditionary On-Demand Manufacturing, Jan 25–26, 2016.

- Digital Council of Excellence, USA, 2016.
- Society of Manufacturing Engineers (SME) — Medical Modeling Coding Committee, May 2016.
- National Institute of Standards and Technology (NIST): panel for photopolymers in medical devices, June 2016.
- National Institutes of Health (NIH): grant reviewer for 3D printing of pediatric devices, July 2016.
- Naval Research Laboratory (NRL): panel on use of 3D printing in medical devices, August 2013.
- NIH reviewer for pediatric AM-produced R21/R33 grant proposals, July 2016.
- Reviewer, Canadian 2017 CFI Innovation Fund Competition.
- SME specialty group on AM in Medicine (Dec 2016).
- RSNA subgroup on medical modeling (Dec 2016).
- DICOM Working Group 22 (dental).
- ADA Standards Committee on Dental Products Working Group No. 2.16 on Extraoral Maxillofacial Prosthetic Elastomers (2017–present).
- CODA site visitor, Prosthodontics (2018–present).
- Contributor to Section 6 (3D Printing), NIDCR Report to the Surgeon General on Oral Health, 2020.
- American Board of Prosthodontics, Director, Jan 2022.

Research Activity

Area of research: My research has consistently aimed to improve clinical outcomes in craniofacial and maxillofacial care by advancing the tools, workflows, and biologic understanding that directly impact patient treatment. Across military, academic, and federal healthcare settings, my work has strengthened clinical decision-making and surgical precision through validated digital imaging protocols, patient-specific modeling, and custom implant fabrication; enhanced functional and aesthetic outcomes via pioneering translational work in facial transplantation and complex reconstruction; and contributed to safer, more reliable care through studies in biomechanics, regenerative approaches, and implant materials. More recent efforts extend this clinical impact to novel environments—including spaceflight surgical capability, robotic instrumentation, and advanced wound-healing modalities—while VA-based trials support improved healing and reduced pain for everyday oral surgery. Collectively, my research portfolio is unified by a focus on delivering technologies, evidence, and methods that meaningfully elevate patient safety, healing, function, and long-term reconstructive success.

Principal Investigator (2004–2015)

- Comparison of 3D craniofacial images captured by cone beam computerized tomography to conventional computerized tomography in accuracy of rapid prototype models: registration of cone beam CT to conventional CT — Navy Dental Research Protocol
- Characterization of the physical properties of a new dental temporary restorative material — Navy Dental Research Protocol

- Comparison of 3D craniofacial images captured by cone beam computerized tomography to conventional computerized tomography in accuracy of rapid prototype models — NPDS protocol
- Pre-combat acquisition of head and neck images — Navy Dental Research protocol
- Validation of the ReFace program for forensic identification. Status: objective evaluation of results with digital standard. Affiliation: FBI Department of Forensics
- Face-Maxilla-Teeth Composite Transplantation: establishment of a novel pre-clinical large animal model, computerized preoperative planning program, and image-guided intervention system for optimizing functional, occlusal, aesthetic, and immunological outcomes — Johns Hopkins Medical Center
- Swine Vascularized Composite Allotransplantation Model — Johns Hopkins Orthotopic Osteocutaneous Craniomaxillofacial Transplantation in a Preclinical Protocol — Johns Hopkins Protocol
- Clinical Evaluation of Craniomaxillofacial Reconstruction Comparing Le Fort-Based, Face-Jaw Transplant with Orthognathic Alignment vs. Standard of Care to Improve Functional and Aesthetic Outcomes — PI, Johns Hopkins Medical Center
- Human Craniomaxillofacial Allotransplantation Protocol — Johns Hopkins Protocol
- Design and Fabrication of Rapid Prototyped Custom Titanium Implants for Head and Neck Reconstruction — NPDS protocol

Assistant Investigator (2004–2015)

- Comparative Study in Intercondylar Distance and Its Significance to Clinical Dentistry
- The Biomechanical Evaluation of Rapid Prototyped Orthopedic Implants
- Restoring Vision via Allo-Transplantation of Functional Orbital-Facial-Globe Cranial Units — PI, Johns Hopkins Medical Center

Collaborator (2004–2015)

- Cranioplasty for the Syndrome of the Trephined, Part I: Cerebral Blood Flow, Cerebral Metabolic and Neuropsychological Outcomes in Pre- and Post-Cranioplasty Patients Following Decompressive Hemicraniectomy for Blast-Induced Head Injury. DARPA-funded project (fabricate custom implants)
- Cranioplasty for the Syndrome of the Trephined, Part II: Early Cranioplasty and a Cranioplasty Construct for Emergent Use in Acute Head Injuries. DARPA-funded project (fabricate flow models for stent testing)
- Nanotechnology as a Carrier for Antibiotics on Craniofacial Implants. Status: bench studies completed, ready for an animal model. Affiliation: NAMU, collaborator
- A Computer Modeling-Based Approach to Study Human Oral, Pharyngeal and Laryngeal Complex — OPAL Modeling Research Network, University of British Columbia
- Post-IED Craniofacial Injury Reconstruction: A Joint Multidisciplinary Military-Civilian Consortium Effort

Current Research (2015–2022)

- Co-investigator — Creating Surgical Capabilities for Exploration Space Flight

- Development of 3D printed medical instruments for robotic use — NASA Translational Research Institute for Space Health (TRISH)
- Collaborator — Development of 3D Fab Lab for Space Exploration — NASA
- Collaborator — LAMBDA (see Funded Research)

Current VA Research

- Clinical trials – “Pulsed Electromagnetic Field (PEMF) Therapy for Oral Wound Healing”
- VA wide registry in use and follow-up of patient specific dental implants (IPS, subperiosteal, etc...)

Consultant (Private)

2016–present: 4D Bio3 Project — collaboration on the use of 3D printing and imaging in customized patient care, involving Walter Reed National Medical Center, Uniformed Services University of Health Sciences, and University of Louisville School of Dentistry/Engineering. Project Managers: Geneva Foundation. Role: member of the BOD for use of additive manufacturing in medicine/dentistry, conflict resolution.

2017: Reef Point Group — Navy Medicine Area Dental Laboratory Improvement project

2017–2019: RICOH — 3D medical printing service

Funded Research

2007 — \$1.7M — BUMED 6.5 funding: Proof of concept — pre-combat capture of hard and soft digital images of the head and neck

2009 — \$180K — Joint Initiative Funding: establishment of a VA craniofacial implant database

2010 — \$700K — Congressional Add for Medical Dental Research: Design and Fabrication of Rapid Prototyped Custom Titanium Implants for Head and Neck Reconstruction

2011 — \$251K — Congressional Add for Dental Research: Design and Fabrication of Rapid Prototyped Custom Titanium Implants for Head and Neck Reconstruction and Image Capture Protocols

2012 — \$450K — Congressional Add for Dental Research: Design and Fabrication of Rapid Prototyped Custom Titanium Implants for Head and Neck Reconstruction and Image Registry Protocols

2016 — \$8M — Defense Health Agency Program funding: DoD/DHA Center for Bio-printing/Fabrication — Recapturing Technology and Advancing the DOD for the Future of

Military Medicine. Awarded via a non-profit collaboration — Naval Research Laboratory, Walter Reed National Military Medical Center, Uniformed Services University of the Health Sciences, and University of Louisville. \$50,000 — Straumann SUPER Grant to develop digital technologies in DMD and Graduate Prosthodontics training

2017 — \$500K — TRI NASA grant for development of surgical capabilities in space TRI NASA grant for development of 3D print capabilities in space

2021 — \$2M (\$400K/4 years) — Department of Commerce: Louisville Additive Manufacturing Business Development Alliance (LAMBDA) — collaborator as Assistant Director, AMIST

2021 — \$2,500 internal funding: Development of a 3D printed ceramic-resin dental restorative material

Other Research Activity

2007–2015 — Armed Forces Institute of Regenerative Medicine (AFIRM): craniofacial imaging in craniofacial reconstruction; craniofacial CAD/CAM implant fabrication

2008 — Chairman, Military Relevance Committee for the DoD USA Medical Research and Materiel Command Congressionally Directed Medical Research Program, 2008 Deployment Related Medical Research Program Scientific Peer Review Meeting (Dec 10–12)

2009 — Technical Advisor, USA Medical Research and Materiel Command, Small Business Innovative Research, Scientific Review Board; Reviewer, Small Business Initiative Research (SBIR) proposals; Department Head, Naval Postgraduate Dental School Research Department

2010 — Scientific Reviewer, DoD USA Medical Research and Materiel Command Congressionally Directed Medical Research Program, 2010 Deployment Related Medical Research Program — Orthopedics (25–26 January)

2012 — Proof of Concept Project: "Additive Manufactured Medical Instruments Fabricated in the Battlefield." Lead Project Manager for design and fabrication. Associated with DARPA AM research.

2013 — Proof of Concept Project: "Additive Manufacturing Feasibility Study on Navy Ships." Lead Project Manager. Associated with DARPA AM research and the CNO's Rapid Innovation Study Group — Navy-wide project.

2014 — ONR Symposium on Structural Health and Monitoring of the Human Skeleton, presenter and participant

2015 — NIH review board for SBIR and STTR applications: RFA-HD-15-023, R41/42 Use of 3-D Printers for the Production of Medical Devices

2016 — 2017 Canadian Foundation for Innovation Fund Competition, reviewer

2017 — Collaborative research — UCLA, MD Anderson, ULSD, for development of a direct print silicone printer for maxillofacial prosthetics

Naval Postgraduate Dental School Thesis Committee

Thesis Committee Chair

2015:

- LT Michael Andersen: #411840-1, A Comparison of Tensile Bond Strength between Low Translucency and High Translucency Lithium Disilicate Ceramics Using Two Different Resin Cements
- LT John A. Chamberlain III: Evaluation of the Dental Effects of Laryngopharyngeal Reflux
- LT James Gwau-Chiahng Linkous: Bond Potential of Lithium Disilicate to Heat-Cured Polymethylmethacrylate (PMMA)
- LT Noel Rodriguez: #412376-1, Comparison of Marginal Fit of CEREC In-Lab CAD/CAM Crowns at Different Interproximal Margin Angulation Preparations
- LT Jared Cameron Beck: Volumetric Changes in Edentulous Alveolar Ridge Sites Utilizing Guided Bone Regeneration and a Custom Titanium Ridge Augmentation Matrix (CTRAM)
- LCDR Gustavo Lores: The Evaluation of 3-Dimensional Polymerization Changes of a Denture Resin Utilizing Injection Molding with Water Bath Polymerization and Microwave Polymerization
- LT Bryan Rasmussen: Comparison of the Internal Fit of Crowns Made by 3 Different Computer Aided Design Systems

2014:

- LT James Doll: The Dentoalveolar Prosthesis: A Novel Approach in the Reconstruction of Hard and Soft Tissue Deficiencies
- LT Walter Dee Thames: The Effect of the Enamel:Dentin Bonding Ratio on the Bond Strength of Porcelain Laminate Veneers
- LT Derrick Gatta: #397297-1, Investigating Bur Cutting Efficiency Using a Zirconia Substrate
- LT Jacqueline Anne-Marie Hogan: #399997, Comparison of the Internal Adaptation of 3-Axis versus 5-Axis CAD/CAM Milled Lithium-Disilicate Anterior Restorations

2013:

- LCDR Bart Cragen: The Evaluation of 3-Dimensional Polymerization Changes of a Denture Resin Utilizing Injection Molding with Water Bath and Microwave Polymerization
- LT Ted Harper: Passive Tolerance of Restorative Super-Structures on External vs. Internal Restorative Connection Platforms of Divergent Dental Implants

2012:

- LT Eric Villarreal: Accuracy of Rapid Prototype Models for Head and Neck Reconstruction

2011:

- LT David Rusthovan: Design and Fabrication of Rapid Prototyped Custom Titanium Implants for Head and Neck Reconstruction
- LT Laleh Abdolazadeh: Different Types of Die Stone Affect the Fit of Porcelain Crowns Fabricated by a CAD/CAM Unit
- LT Garin Liu: Effect of Delayed Setting Expansion of Dental Stones on Implant Analog Position

2010:

- LT Kelly Stone: The Evaluation of 3-Dimensional Polymerization Changes of a Denture Resin Utilizing Injection Molding with Water Bath Polymerization and Microwave Polymerization
- LCDR Christopher Hamlin: Reproduction of Detail and Surface Quality of Type IV Dental Stone in an Irreversible Hydrocolloid Impression Inverted at Various Time Intervals During Setting

2009:

- LCDR John Hoyos and CPT Joshua Vess: Characterization of the Physical Properties of a New Dental Temporary Restorative Material

University of Louisville Thesis Committee

2021:

- Mohammad Qasim Shaikh: Design for Metal Fused Filament Fabrication (DFMF3) of Ti-6Al-4V Alloy (PhD Mechanical Engineering dissertation)
- Prajakta Shreeram Kulkarni: Accuracy of Validation Methodologies for 3D Printed Models
- Kristen Eguren: Dispersion of Intraoral Fluids with High-Speed Handpieces

2020:

- Elizabeth Felton: Comparison of Facial Scanning Systems (MSD)
- Jasmine Mohandesi: Comparison of the Accuracy of Different 3D Print Technologies (MSD)

2019:

- Katie Kuric: Accuracy of Indirect Digital Scanning on Different Fixed Restoration Fabrication (MSD)
- Mikal Lindman: The Effect of Crown Marginal Designs on the Accuracy of Indirect Digital Scanning (MSD)

2018:

- Peter Wolfe: Improving Esthetic Outcomes of Congenitally Missing Lateral Incisors with Implant Therapy (MSD)

2016:

- Mark Talis: Osteogenic Differentiation of hSVF on a 3D Substrate, Master's Thesis

University of Louisville Summer Research Programs

2021:

- Chad Hartley: Dynamic Superimposition of STL Data from Extra-Oral, Intra-Oral and CBCT
- Payton Lofton: Creation of a Virtual Patient with Four-Dimensional Optical Jaw Tracking Incorporating Virtual Articulation of Digital Models and CBCT
- Jaquelin Wells: Comparison of CADIAX Compact Digital Temporomandibular Tracking System to MODJAW 4D Jaw Tracking

2019:

- Chad Hartley, Katherine Schneidau: Creating a Universal System for Measuring the Accuracy of 3D Printed Dental Models
- Haneen Matalgah: Contact vs. Optical Scanning in Validation of 3D Printed Dental Arches
- Collin Wietfeldt: Relative Accuracy of Facial Scanners

Patent Activity

Provisional/Non-Provisional Patent Applications (Sole/Co-Inventorship)

NC101971 — Adjustable head positioning device for use with cone beam CT scanner (14/303,368)

Recent Patent Applications

Medical/Surgical Patent: U.S. International Patent Application (PCT/US14/67656), "Computer-Assisted Craniomaxillofacial Surgery." Inventors: Gordon C, Armand M, **Grant G**, Liacouras P, Murphy R, Wolfe K. Johns Hopkins University Office of Technology Transfer (filed Nov. 26, 2014).

Patents

- U.S. Patent 9,456,792 B2, "Adjustable Head Positioning Device for Use with Cone Beam CT Scanner." Inventors: Gerald T. Grant and Shayne A. Kondor. United States of America as represented by the Secretary of the Navy (filed Jun. 12, 2014; granted Oct. 4, 2016).
- US 2017/0000498 A1, "Patient-Specific Trackable Cutting Guides." Inventors: **Grant G**, Liacouras P, Gordon C, Murphy R, Armand M. Johns Hopkins University Office of Technology Transfer (filed Nov. 26, 2014). Granted as U.S. Patent 10,682,147 B2 (Jun. 16, 2020).
- US 2017/0000566 A1, "Computer-Assisted Face-Jaw-Teeth Transplantation." Inventors: Gordon C, Armand M, **Grant G**, Liacouras P, Murphy R, Wolfe K. Johns Hopkins University Office of Technology Transfer (filed Nov. 26, 2014). Granted as U.S. Patent 10,537,337 B2 (Jan. 21, 2020).
- US 2017/0000564 A1, "Computer-Assisted Planning and Execution System." Inventors: Gordon C, Armand M, **Grant G**, Liacouras P, Murphy R, Wolfe K. Johns Hopkins University Office of Technology Transfer (filed Nov. 26, 2014). Granted as U.S. Patent 10,448,956 B2 (Oct. 22, 2019).
- US 2017/0000565 A1, "Orthognathic Biomechanical Simulation." Inventors: Murphy R, Basafa E, Gordon C, Armand M, **Grant G**, Liacouras P. Johns Hopkins University Office of Technology Transfer (filed Nov. 26, 2014). Granted as U.S. Patent 10,631,877 B2 (Apr. 28, 2020).
- US 2017/0000504 A1, "Real-Time Cephalometry for Craniomaxillofacial Surgery." Inventors: Murphy R, Basafa E, Gordon C, Armand M, **Grant G**, Liacouras P. Johns Hopkins University Office of Technology Transfer (filed Nov. 26, 2014).

Other Funded Activities

2016 — \$50,000 — Straumann University Programs and Educational Research Grant

Professional Licensure — Kentucky #5974; 1985–present

Board Certification: Diplomate, American Board of Prosthodontics, 2002

V. HONORS

- *Fraternal Achievement Award*, Psi Omega Fraternity, Omicron Chapter, University of Louisville School of Dentistry, 1985
- *John J. Sherry Award for Dental Research*, presented by the American College of Prosthodontics for postgraduate dental research, 1995 ACP Annual Meeting, Washington, DC
- *Finalist, Fuchette International Research Competition* — "Failure Behavior of Human Cranial Bone and Developmental Calcium Phosphate Implants," International Academy of Dental Research, Washington, DC, 05–08 April 2000

- *Major General Bill B. Lefler Federal Services Award*, in recognition of advancements to prosthodontics in the United States military, awarded by the American College of Prosthodontists, Annual Meeting, San Diego, CA, 4–7 November 2009
- *2012 Judson Hickey Award for Scientific Writing — Research*, "Accuracy of Rapid Prototype Models for Head and Neck Reconstruction," awarded by the Journal of Prosthetic Dentistry, 2012
- *Grand Prize Award* for paper presentation, "On Demand Additive Manufacturing of a Basic Surgical Kit," American Society of Manufacturing Engineers Design of Medical Devices Conference, Minneapolis, MN, April 2013
- *2014 Abell Foundation Award* for technical transfer work on "Computer-Assisted Craniomaxillofacial Surgery" (JHU REF: C12739), joint research development between Co-PIs — Johns Hopkins Hospital, Johns Hopkins Applied Physics Lab, and Walter Reed National Military Medical Center. 2014 JHU/UMD Alliance Meeting, 18 Feb 2014
- *Community Heroes Award* — 3D Medical Application Center, awarded by the Military Officers Association of America, Dec 2014
- *2015 Tech Connect National Innovation Award* — "CAPE System: Computer-Assisted Craniomaxillofacial Surgery," collaborative research with Johns Hopkins Applied Physics Lab, Johns Hopkins University, and the Walter Reed 3D Medical Applications Center, awarded at the Tech Connect World Innovation Conference, Washington, DC, June 14, 2015
- *Transylvania University Distinguished Alumni Award*, presented by the alumni association to recognize individuals who have made a positive contribution to the community, May 2016
- *Clinician Researcher Award*, awarded by the American College of Prosthodontists in recognition of professional contributions to clinical research, October 2016 Annual Meeting, San Diego, CA
- *2024 Judson Hickey Award for Scientific Writing — Research* — "The Future of Maxillofacial Prosthodontics in North America: The Role of Advanced Digital Technology and Artificial Intelligence — A Discussion Document," J Prosthet Dent, May 2024

Military Personal Awards

- Legion of Merit
- Meritorious Service Medal
- Navy Commendation Medal (3)
- Navy Achievement Medal

Fellowships

- Fellow, American College of Prosthodontists
- Fellow, American Academy of Maxillofacial Prosthetics
- Fellow, International College of Dentists
- Fellow, International College of Prosthodontists
- Fellow, International Society for Maxillofacial Reconstruction

VI. SIGNIFICANT POSITIONS / COLLATERAL DUTIES (Military)

1987–1990 Fleet Liaison Officer, Branch Director Kadena Dental Clinic, Temporomandibular Consultant for Okinawa military members, Command Training Officer

1992 Medical Platoon Commander, 2nd FSSG / Dental Officer, 26 MEU

1992–1993 Division Officer, 12th Dental Companies, New River

1995–1998 2nd Dental Battalion / Command Training Officer, CAT Team Member, Battalion Operations Officer, Director of Clinical Services, Osborne Dental Clinic

1999–2002 Staff Maxillofacial Prosthodontist, Implant System Instructor, Clinic Director for Restorative Dentistry Department, and Command Implant Consultant, Portsmouth Naval Medical Center

2002–2004 Department Head, USS Dwight D. Eisenhower (CVN 69)

2004–2011 Navy Specialty Leader to the Surgeon General for Maxillofacial Prosthetics and Dental Implants Chair, Maxillofacial Prosthetics Department, Naval Postgraduate Dental School

2009–2015 Integrated 3-D Medical Applications Service Chief, Department of Radiology, Walter Reed National Military Medical Center, Bethesda

2010–2011 Acting Chair, Research Department, Naval Postgraduate Dental School

2011–2015 Director of Craniofacial Imaging Research, Naval Postgraduate Dental School Service Chief, 3D Medical Application Center, Walter Reed National Military Medical Center

2013 NIH Advisor for 3D Medical Printing Applications

2014–2015 BUMED Subject Matter Expert for 3D Medical Applications/Additive Manufacturing in Medicine to the Navy J4 Consultant for Use of 3D Printing in Navy Logistics