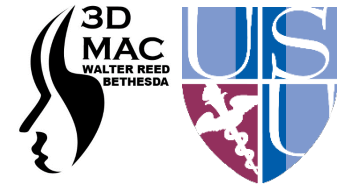




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Medical Center



Overview of the 3D Medical Applications Center

Peter Liacouras, PH.D.

Director of Services

Maj John P. Lichtenberger III, MD, USAF, MC

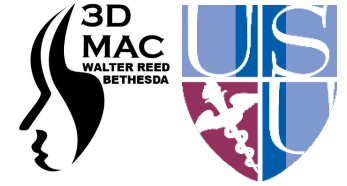
Service Chief

March 4, 2016



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Medical Center

Disclaimer



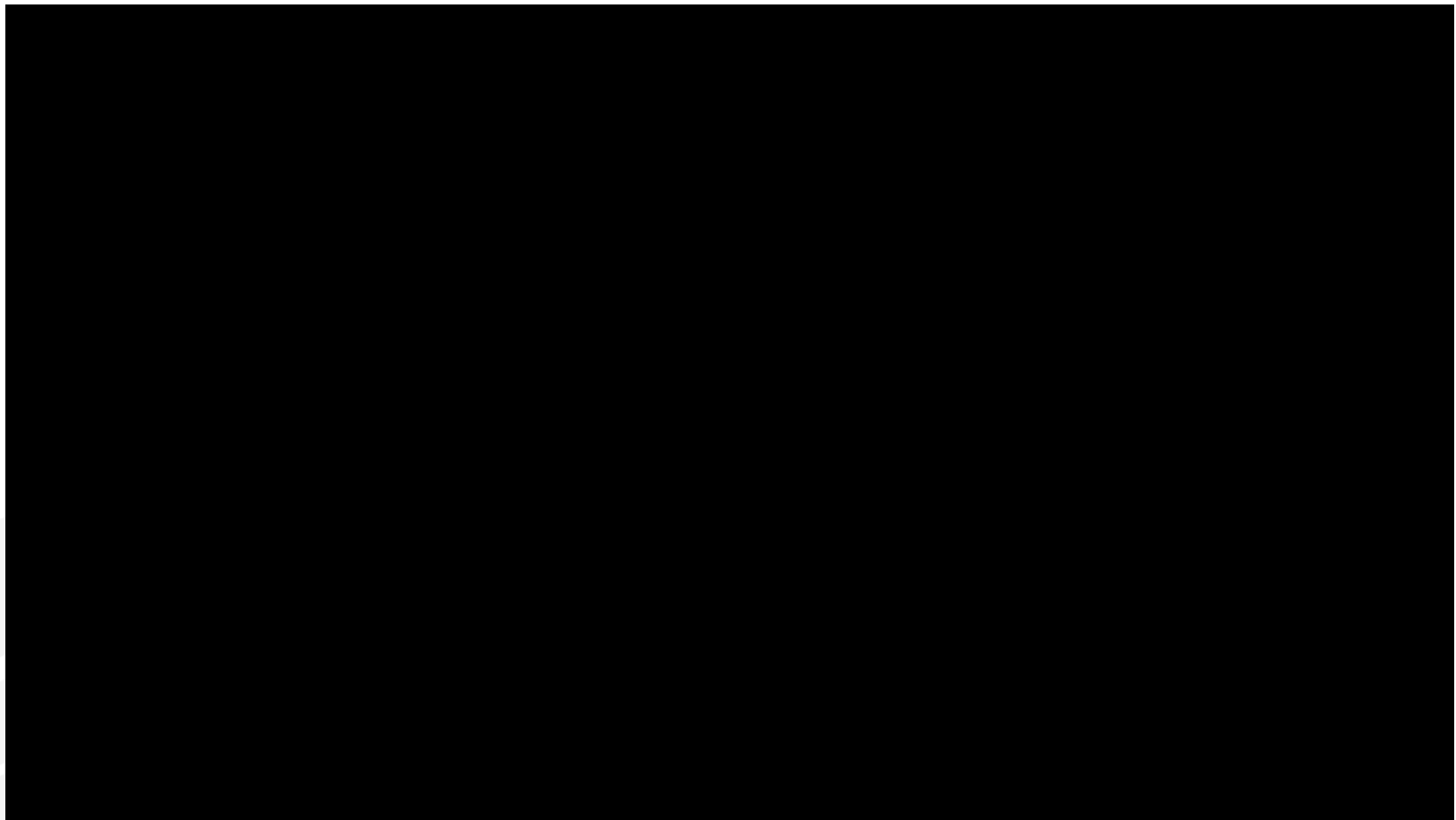
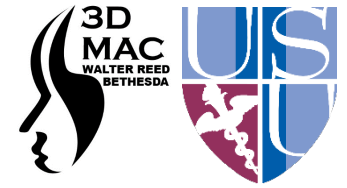
The views expressed in this presentation are those of the authors and do not reflect the official policy of the Department of Army/Navy/Air Force, Department of Defense, or U.S. Government.





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Introduction Video





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Mission

- 3D Medical Applications Center (3D MAC) is an Additive Manufacturing Facility located within the Department of Radiology at Walter Reed National Military Medical Center.
- Mission Statement:
 - The mission of the 3D Medical Applications Center is to provide computer aided design (CAD) and computer aided manufacturing (CAM) for the fabrication of medical models and custom implants, Provide technical support for virtual treatment planning, and image capture in the support of patient treatment, graduate medical/dental education and research.
- Services internal customers of Walter Reed and other Department of Defense and VA facilities



Services

Orthopedic



Research



Dentistry



Craniofacial



Quick Links

- > Radiology Home
- > 3DMAC Home
- > Custom Implants
- > Product Technology
- > Scanning Guidelines
- > Surgical Guides
- > Surgical Models
- > Surgical Planning
- > Place an Order*
- > Review Orders*

*CAC Required



3-D Medical Applications Center (3DMAC)


Mission Statement
The mission of the 3D Medical Applications Center is to provide computer aided design (CAD) and Computer aided manufacturing (CAM) for fabrication of medical models and custom implants, provide technical support for virtual treatment planning, and image capture in support of patient treatment, graduate medical/dental education and research.

Population Served
The 3D Medical Applications Center serves internal customers of the Walter Reed National Military Medical Center, the Uniform Services University, the Naval Postgraduate Dental School, Department of the Defense MTF/DTF's, other federal entities, and worldwide allied medical institutions.

Videos


[Introduction](#)


[3-D Printing](#)


[Electron Beam Melting](#)


[Fused Deposit Modeling](#)

Contact

Location:
3D Medical Applications Center
Walter Reed National Military Medical Center
8901 Wisconsin Avenue
Building 1, Tower
Fourth Floor
Bethesda, MD 20889

[\(301\) 295-8594](tel:301295-8594)

Contact

Location:
Building 1, Tower
Fourth Floor

Phone
[\(301\) 295-8594](tel:301295-8594)

[▶ EMAIL US](mailto:301295-8594)

Hours of Operation
Monday thru Friday
0700 - 1600

Publications

Accuracy of Rapid Prototype Models for Head and Neck Reconstruction Overview

Accuracy of Rapid Prototype Models for Use in Head and Neck Reconstruction

Design and Manufacturing an Auricular Prosthesis

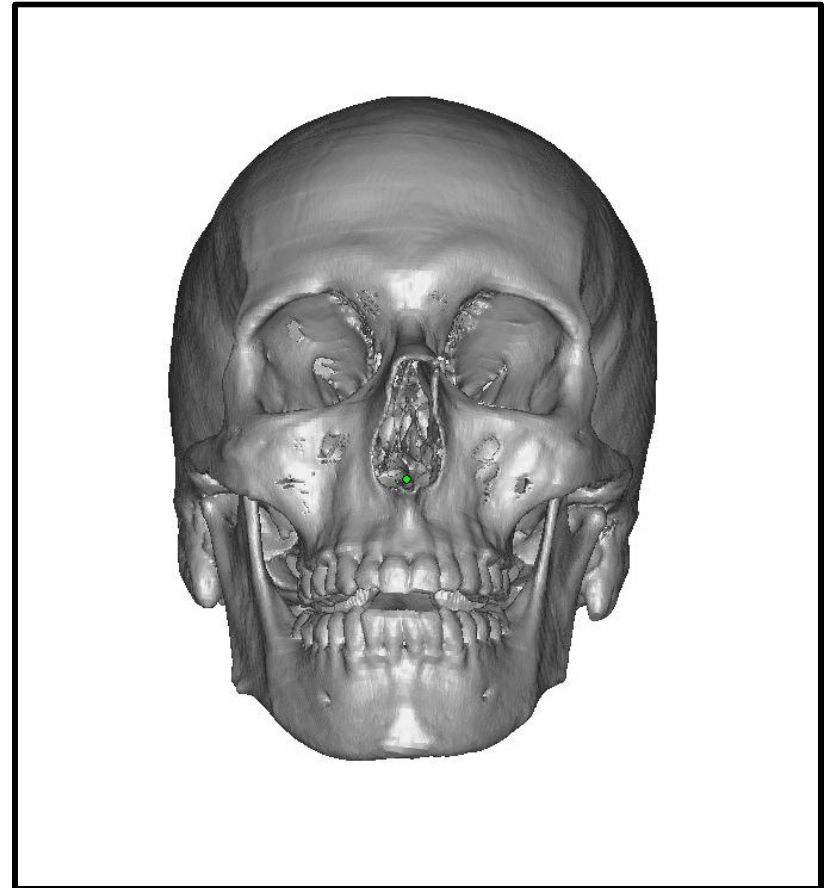
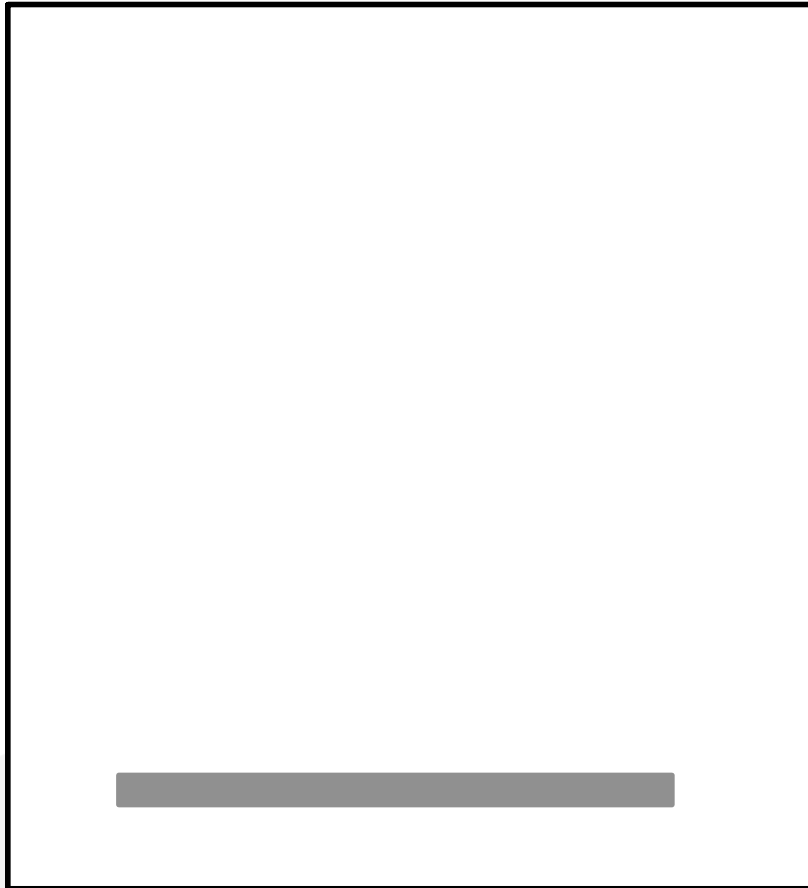
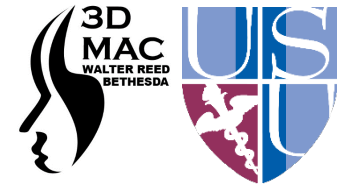
Color 3D Printed Anatomical Models

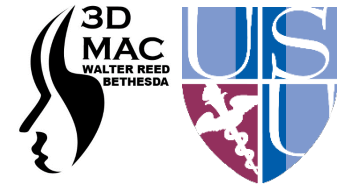
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Additive vs. Subtractive Manufacturing

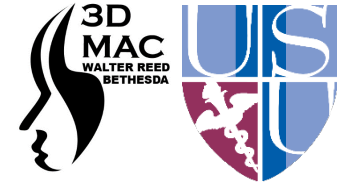




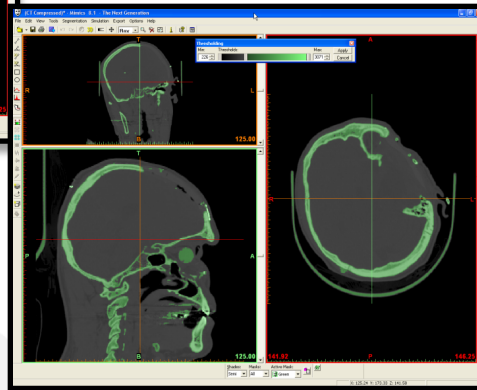
- Over 7000 Medical Models
- Over 300 Cranial Plates
- Over 70 Custom unique prosthetic and rehabilitation devices and attachments (Most popular shorty feet over 50 pairs)
- Research, simulation, and training models



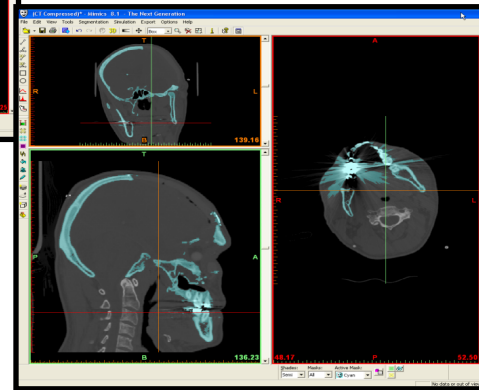
Scan Acquisition: Basic Software Overview



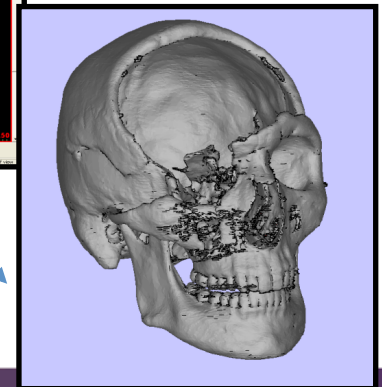
Import DICOM Images



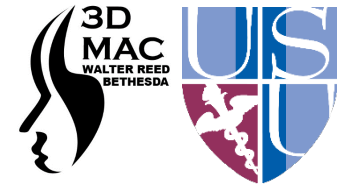
Threshold



Eliminate Unwanted Artifacts



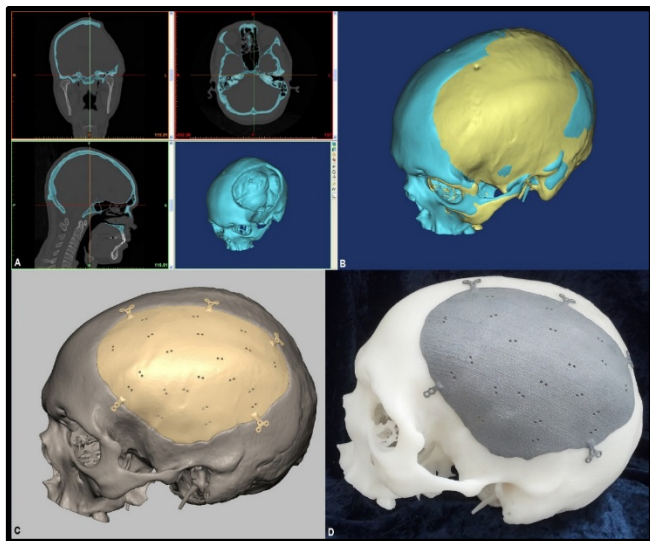
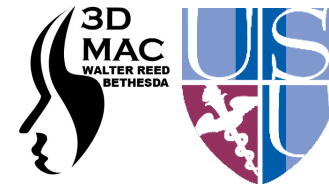
Virtual Model (STL)



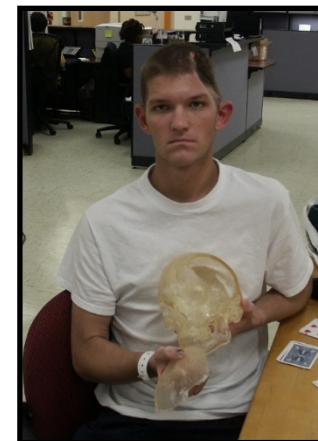
- Pre-operative planning
- Pre-bend reconstruction bars / fixation
- Custom implants: cranioplasties
- Greatly improves visualization of injury
- Minimizes surgical exposure
- Time reduction for major surgeries
- Reduced morbidity and hospital length of stay
- Better fitting prosthesis
- Enhance patient understanding; informed consent
- Specialty prosthetic and rehabilitation attachments and devices



Neurosurgery Applications



Design Process



Patient Before

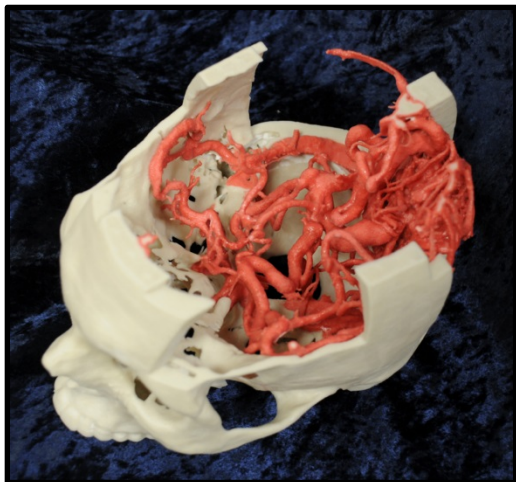
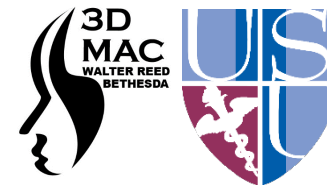
Patient After



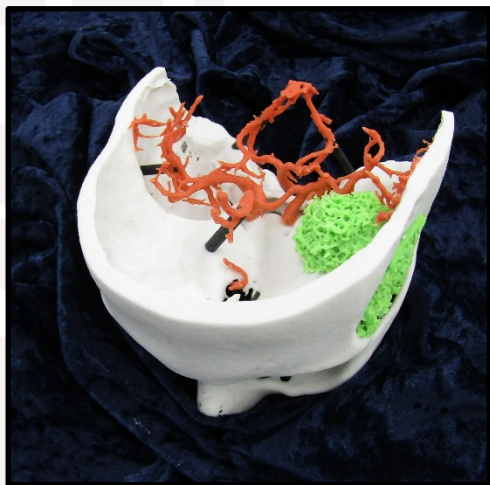
3D Printed Template and Mold



PMMA Implant

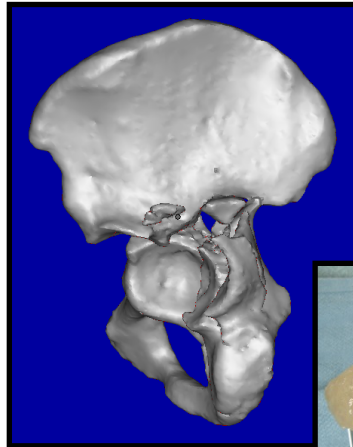
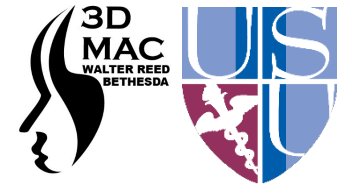


AVMs,
Aneurysms,
and Tumors

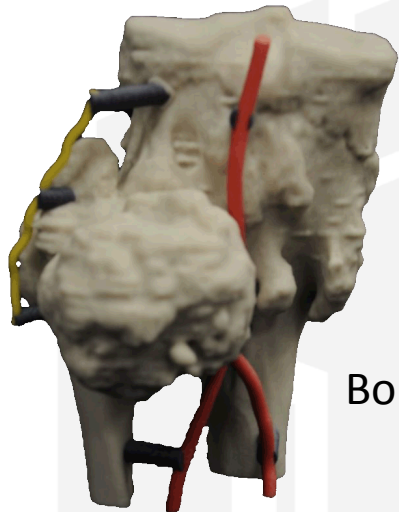
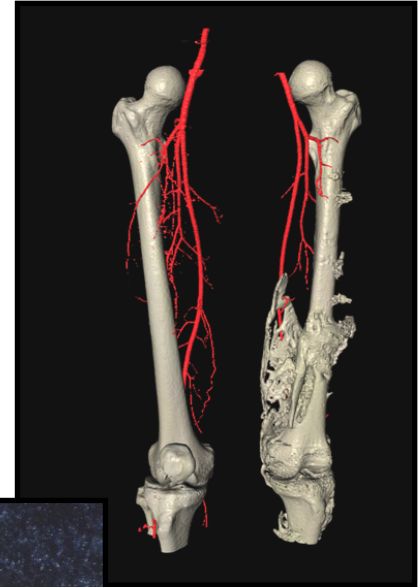


Complex Spinal Cases





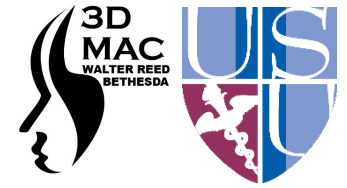
Fractures and
Pre Bending of Fixation Bars



Bone Tumors



Heterotopic
Ossification



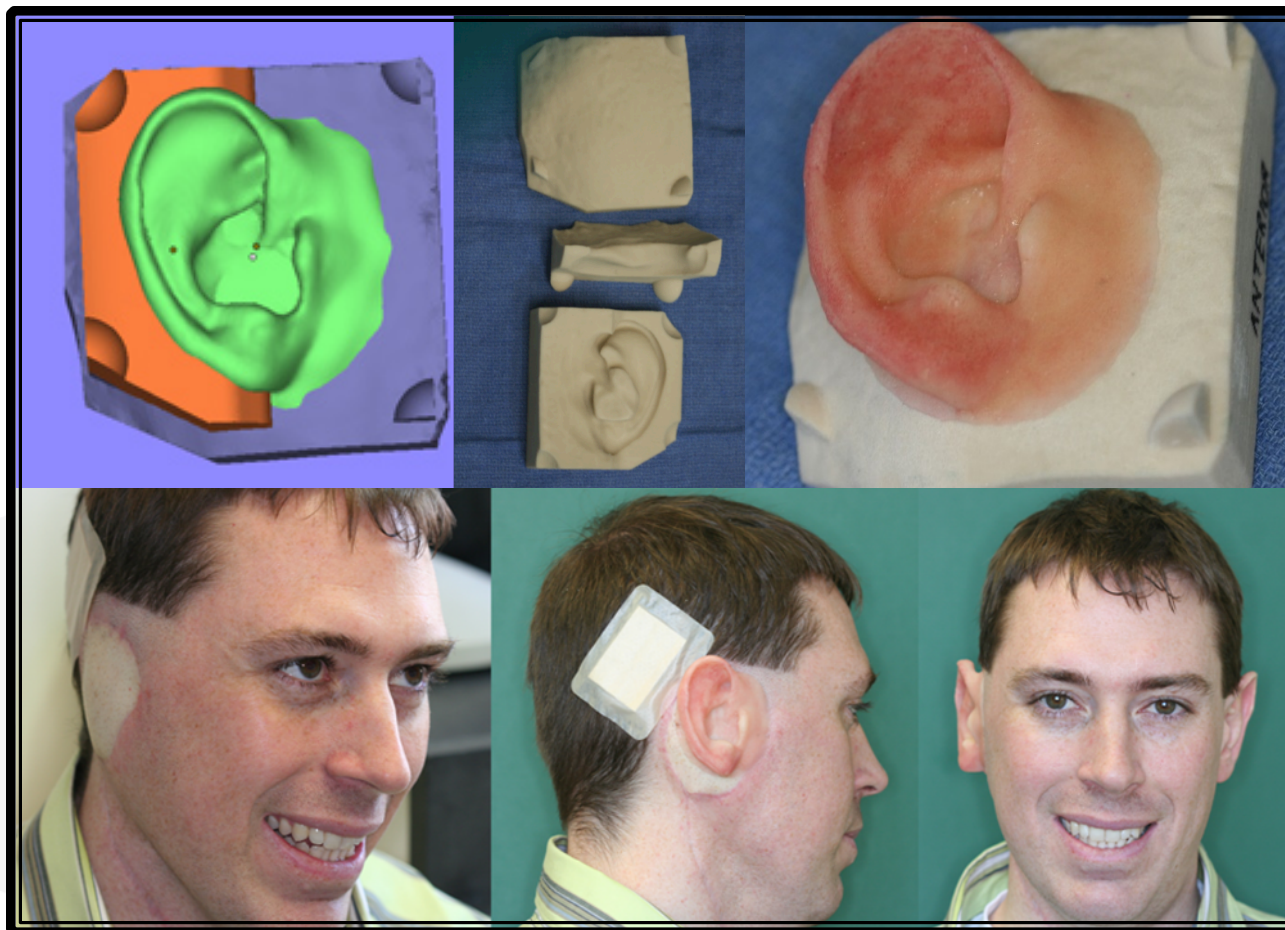
Cysts, Tumors, Impacted Molars



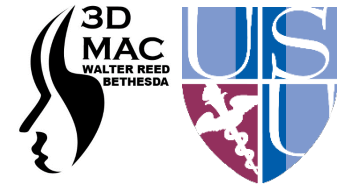
Pre Op and Post Op Surgical Models



Maxillofacial Prosthetics Applications



Digitally Designing and Manufacturing of Molds for Facial Prosthetics



Bi-lateral Hockey Skate Adapters

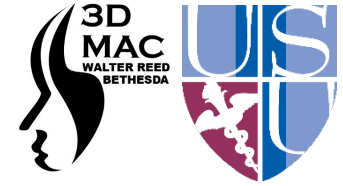
Shorty Feet

Multi Purpose Weight Lifting Adapter





Rehabilitation and Prosthetics Applications



Hockey Hand



Fishing



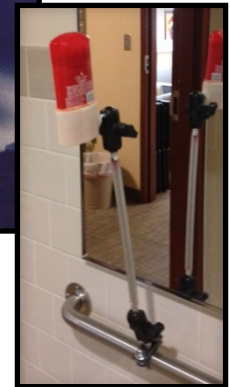
Wine Glass Holder



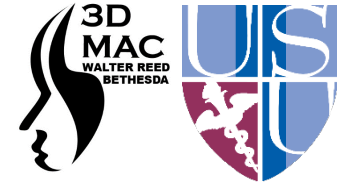
Magnification Holder



Clamps and Brackets



Deodorant Holder



- 3D MAC enhances clinical care
 - Customized products for our patients and wounded warriors
 - 3D models, surgical guides, custom implants, and unique devices
- Inter-professional collaboration and communication are our strengths
 - Essential to success

