



CAD/CAM in the VA System

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CAD/CAM in the VA

- Early visionaries in VA RR&D were responsible for advancing a proof-of-concept for prosthetics CAD/CAM into a commercial reality
 - This fledgling industry garnered early successes and maintains a loyal following
 - As with any new technology, manufacturers are ill-equipped to further it on their own
 - The VA's role remains vital to advance this technology to a higher level of efficiency, function, and utility
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Key research objectives

1. Implementation research in the VA clinical arena
 2. Development of next-generation data input, socket design, and automated manufacture subsystems; smart systems
 3. Incorporate recent understandings in prosthetics science into the CAD/CAM model
 4. Garner further comprehension that will contribute to the efficiency, economy, and ease of use of CAD/CAM in prosthetics
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1. Implementation Research

- The VA was the first to institute widespread installation and use of CAD/CAM and central fabrication
 - An aggressive training schedule led to early implementation, but later decentralization of PSAS led to disparities in CAD/CAM utilization among the sites and a failure of some sites to meet productivity goals
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1. Implementation Research RFP's

- Survey existing CAD/CAM equipment; identify facilitators and barriers within VA healthcare system
 - Evaluate existing VA CAD/CAM software and hardware
 - Establish clinical service protocols for maximum efficiency
 - Determine most appropriate software and hardware solutions for individual facilities
 - Retool and modernize systems where appropriate
 - Provide onsite training to match established procedures
 - Perform studies to evaluate the efficient and sustained use of CAD/CAM through innovative implementation methodologies within the VA healthcare structure
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Note

While Otto Bock has generously offered to contribute to the VA CAD/CAM effort, it is imperative that systems from each manufacturer be evaluated based on their merit, potential, and conformance to the requirements to be established

2. “Smart” CAD/CAM Systems RFP’s

- Smart CAD/CAM systems will streamline operations, increase accuracy, and provide decision support to the prosthetist
 - Upper and lower limb prescription aid for component selection
 - Automated feature recognition
 - Self-improving templates
 - Selectable modifications for manufacturer-specific interface components
 - Myo-electrode placement optimization
 - Cosmesis
 - Outcomes measurement and tracking
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3. Prosthetics Engineering RFP's

- Expand capabilities using add-in modules incorporating state-of-the-art fitting techniques and advancements in prosthetic science
 - Integrated alignment
 - “All-in-one” prostheses
 - Failure analysis
 - Bowden cable routing for hybrid upper-limb prostheses
 - Automatic electronic control adjustment
 - Functional characteristics of multiple components in a complete prosthesis
 - Advanced, automated fabrication of prosthetic limbs (i.e. elimination of positive models)
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4. Basic research RFP's

- CAD/CAM in the VA can improve prosthetic care by providing an avenue for implementation of advancements in the science of prosthetics
 - Tissue viability
 - Interface mechanics
 - Finite element analysis (FEA)
 - Medical imaging integration
 - Smart materials
 - Service life
 - International Standards Organization (ISO) standards
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CAD/CAM Education

- CAD/CAM is a tool requiring its own skill-set; these skills are not being taught by the formal P&O educational programs
 - Energize and educate Certified P&O faculty in CAD/CAM training programs
 - Develop partnerships between the VA, residency training programs, and local P&O educational programs
 - Influence coordinated CAD/CAM standards among the accreditation committees, certification organizations, and professional societies
 - Augment existing CAD/CAM software with educational modules to allow comparison between student projects and an expert model
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DoD/VA CAD/CAM Collaborations

- CAD/CAM offers a unique facility for records management, as well as a challenge in data storage and retrieval
 - Standardize CAD/CAM format of patient data files
 - Addition of CAD/CAM data types to a centralized patient information database
 - Seamless transfer of patient data to augment continuity of care within and between agencies
 - Facilitate VA's ability to provide backup capacity to DoD (or vice versa)
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Challenges to progress

- The pool of experts in CAD/CAM research is small; current restrictions on extramural partnerships by the VA limit the achievement of these goals
 - Similarly, the requirement for a clinical P.I. in VA Centers of Excellence may preclude otherwise qualified research teams from responding to RFP's
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Opportunity

Realization of these goals will provide prosthetists with unparalleled tools to provide the best quality of care to incoming wounded servicemen and women and veterans; tools that are not simply replacements for “rasp and plaster,” but a heretofore unachievable means to improve prosthetic outcomes
