3D PRINTING AT VHA

3D PRINTING AT VHA

Over the past few years, the benefits of 3D printing have moved from imagination to practice. 3D printing technologies used for pre-surgical planning, for example, can save doctors as much as two hours per surgery, or up to $9,600 in cost avoidance for the facility. It also reduces the time patients are under anesthesia and increases operating room availability for other Veterans. The VHA 3D Printing Network was created to organize and support the 3D printing efforts of innovators across VHA. Fueled by the VHA Innovation Ecosystem as a portfolio of Care & Transformational Initiatives, the 3D Printing Network is helping innovators at VHA use 3D printing to solve a wide range of Veteran problems.

3D PRINTING NETWORK

Innovators across VHA have an ambitious goal: for every VA Medical Center to have access to 3D printing services. The 3D Printing Network is bringing VHA closer to this reality, with 33 sites across the enterprise and counting. The Network acts as a conduit to share expertise and ideas, troubleshoot and solve problems, gather quantitative data, implement and diffuse innovations, pool resources, and extend 3D printing capabilities across the enterprise. As the Network grows, sites will be able to request print jobs from various VA Medical Centers with centralized material, printer, and resource availability. Emerging 3D printing technology is empowering the VHA 3D Printing Network to explore a range of applications in five core clinical capabilities: Pre-surgical Planning, Orthotics & Prosthetics, Assistive Technology, Dental Applications, and Bioprinting.

3D PRINTING CORE CLINICAL CAPABILITIES:

PRE-SURGICAL PLANNING

VHA Clinicians use 3D printed models to assess a patient's anatomy, potential outcomes and risks, and how to best proceed with treatment. VHA surgeons are using 3D printed models to consult with their patients and with specialists across state lines.

ORTHOTICS & PROSTHETICS

Patient-matched 3D printed hand and foot orthotics are custom designed to meet the needs of the patient, and can be replaced remotely without a Veteran having to travel for repeat fitting and replacements. VHA is also working to ensure the safety and performance of 3D printed prostheses once adopted into clinical practice.

ASSISTIVE TECHNOLOGY

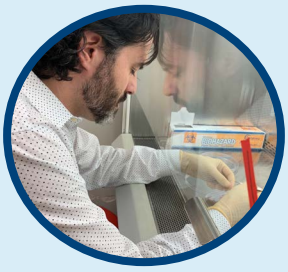
Assistive Technology creates customized Veteran solutions that restore independence and allow Veterans to engage in everyday tasks, ranging from participating in adaptive sports to gripping and eating hearty hamburgers.

DENTAL

The addition of 3D printing and scanning technologies in dentistry have allowed for an increase in surgical guides, same-day crowns, night guards and more, delivering faster, more efficient dental services to Veterans.

VHA INNOVATION Ecosystem

THE NEXT FRONTIER: BIOPRINTING

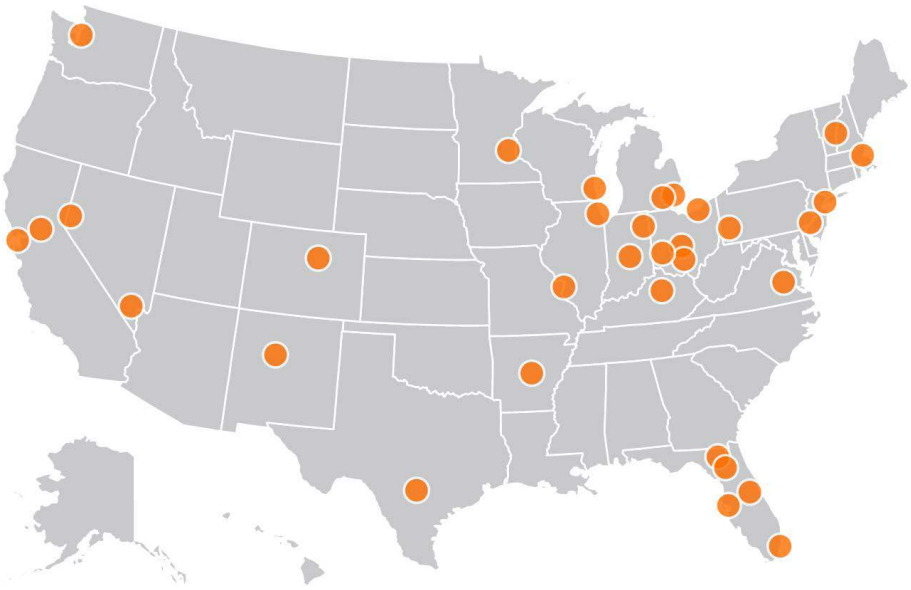


BIOPRINTING

The next frontier for VHA is bioprinting, the fabrication of 3D printed structures that can support living cells. Bioprinting opens the door to the creation of living tissues that currently must be harvested from a patient or a donor. It is hoped that bioprinting may one day close the growing gap between supply and demand for organs and tissues.

Bioprinters are currently located at a handful of VA hospitals across the Network. Projects range from using the unique manufacturing capabilities of 3D printers to aid in the creation of a total artificial lung (Ann Arbor VA) to the 3D printing of actual bone and blood vessels into the shape of a patient's missing bone (VA Puget Sound). A dedicated 3D Tissue Bioprinting Core, located at the Richard L. Roudebush VA Medical Center in Indianapolis, supports projects from multiple investigators who are working to create bone, cartilage, retinal and neural tissues. The work in bioprinting across VA ranges from research focuses expected to impact patients in the future (5-10 years), to projects designed to be ready for clinical use in a few short years.

3D PRINTING NETWORK SITES



3D Tissue Bioprinting Core Laboratory at Richard L. Roudebush VA Medical Center (Indianapolis)

Bruce W. Carter VA Medical Center (Miami)

Central Arkansas Veterans Health Care System (Little Rock)

Chalmers P. Wylie VA Ambulatory Care Center (Columbus)

Chillicothe VA Medical Center (Chillicothe)

Clement J. Zablocki Veterans Affairs Medical Center (Milwaukee)

Corporal Michael J. Crescenz VA Medical Center (Philadelphia)

Dayton VA Medical Center (Dayton)

Edward Hines, Jr. VA Hospital (Hines)

Hunter Holmes McGuire VA Medical Center (Richmond)

James A. Haley Veterans' Hospital (Tampa)
John D. Dingell VA Medical Center (Detroit)

Lake City VA Medical Center (Lake City)

Lexington VA Health Care System (Lexington)

Malcom Randall VA Medical Center (Gainesville)

Minneapolis VA Health Care System (Minneapolis)

Orlando VA Medical Center (Lake Nona)

Raymond G. Murphy VA Medical Center (Albuquerque)

Rocky Mountain Regional VA Medical Center (Aurora)

San Francisco VA Health Care System (San Francisco)

South Texas Veterans Health Care System (San Antonio)

VA Ann Arbor Health Care System (Ann Arbor)

VA Boston Health Care System (Boston)

VA New York Harbor Health Care System (Manhattan)

VA Northeast Ohio Health Care System (Cleveland)

VA Northern California Health Care System (Mather)

VA Northern Indiana Health Care System (Fort Wayne)

VA Pittsburgh Health Care System, Human Engineering Research Laboratories (Pittsburgh)

VA Puget Sound Health Care System (Puget Sound)

VA Sierra Nevada Health Care System (Reno)

VA Southern Nevada Health Care System (Las Vegas)

VA St. Louis Health Care System (St. Louis)

White River Junction VA Medical Center (White River Junction)