Digital Anatomy™ 3D Printer

Better preparation. Better outcomes.

Description option 1:

Digital Anatomy 3D printed models replicate the same biomechanical properties as human tissue to provide the most realistic testing and training—all at a cost reduction of up to 70% compared with fabricated simulators, animals, and cadavers.

With highly repeatable medical device testing and surgical preparation, you can create consistency across the continuum of care—better surgical tools, improved patient outcomes, and fewer hospital readmissions.

Description option 2:

With the most realistic anatomical models available, you can standardize surgical skills and device testing to create consistency across the continuum of care. Digital Anatomy 3D printed models replicate the same biomechanical properties as human tissue to minimize variability in device testing and surgical training, which leads to more consistent outcomes for patients.

Description option 3:

Digital Anatomy 3D printed models replicate the same biomechanical properties as human tissue to minimize the variables in surgical training and device testing that lead to poor outcomes. Realistic, highly repeatable results improve efficiency and quality across the continuum of care.

	Academic Centers	**Medical Device Manufacturers**
Supporting sub-headline	Minimize variation in a clinical setting with highly-realistic, low-risk training.	Create consistency in testing to enhance product quality, reduce costs, and accelerate time to market.
Supporting points	• Standardize delivery of care • Most accurate representation targeted pathology at a cost reduction of up to 70%	• High repeatability between samples minimizes confounding variables • Clinically-relevant benchtop testing

	Cardiac	**Vascular**	**Orthopedic**
Application messages	Anatomical consistency you can **see** and **feel**. Experience the most consistent, accurate representation of your targeted pathology.		

Supporting sub-headline	Experience the physiological response of native cardiac tissue.	Experience the arterial elasticity caused by changes blood pressure.	Experience the density properties of human bone.
Supporting points	• **See** the accurate biomechanical behavior associated with gender, age, ethnicity, and other physiological and pathological characteristics. • **Feel** realistic feedback while suturing, cutting, inserting, and deploying devices.	• **See** how the artery will move as internal and external forces are applied with six pre-set blood vessel material options, ranging from compliant to rigid. • **Feel** realistic vessel responses while inserting and deploying devices.	• **See** accurate bone articulation. • **Feel** realistic feedback while tapping, reaming, sawing, inserting screws, and attaching plates.
Biomechanical testing	• A study comparing the biomechanical properties of porcine tissue to 3D printed myocardium found that **Digital Anatomy printed models mimic real tissue better than any other material**. • The 3D printed model demonstrates similar compliance and failure modes as real tissue.	• A study comparing 3D printed aortic, carotid, and coronary artery models to native vessel behavior found that **the Digital Anatomy Printer can create the most accurate arterial models on the market.** • Aortic, carotid, and coronary arteries were simulated to mimic blood pressure changes at body temperature and measured using IVUS. • The study demonstrated that the 3D printed vessels mimicked the same biomechanical properties as native vessels.	• A literature survey that compared screw fixation in 3D printed bone models, sawbones, and human cadavers **did not demonstrate a significant difference** between artificial and human bones.

Digital Anatomy Printer Software

The power to create the most realistic anatomical models.

Digital Anatomy Printer software gives you the power to create the most lifelike anatomical models available. Clinically-validated preset anatomy options deposit 3D printing materials to behave with biomechanical accuracy that mimics human tissue and bone like never before.[1]

The power to create
accurate biomechanical behavior.
Combinations of materials and more than 100 preset anatomical menu options allow you to mimic disease states and physiological factors with biomechanical accuracy. Anatomies are configured using unique material combinations that vary in softness, flexibility, and density to mimic native tissue behavior.

The power to create
in a few simple clicks.
The preset anatomy menu offers more than 100 options that allow you to print accurate, lifelike models by simply choosing the desired anatomy.

The power to mimic native tissue and bone structures.[2]

Complex Blood Vessel Capabilities Create and remove support structures from internal cavities such as small, complex blood vessels.	**Slice Preview** Visualize individual slices of internal anatomy structures and confirm pathology, material, and orientation choices.	**Screw Insertion Strain Relief** In orthopedic models, create regions for screw entry so you can place screws without cracking the model.	**Long Bone Manipulation** Autogenerate the intricate, unique structures of bone in each region: proximal, distal, cortical, cancellous, and the medullary canal.	**Myocardium Consistency** Experience the same non-directional behavior as human tissue when force is applied in any direction.

The power to create
with physician-tested, validated presets.
Digital Anatomy Printer software was developed and refined over years of expert testing in partnership with top academic medical centers and hospitals across the globe. The anatomical

presets have been validated to demonstrate the same feel and biomechanical performance as human anatomy.[3]

Digital Anatomy Printer software unlocks the unique material combinations that create unparalleled realism

BoneMatrix™
Complex material depositing patterns mimic porous bone structures, fibrotic tissues, and ligaments.

GelMatrix™
Unique GelMatrix material and GelSupport™ depositing patterns allow you to print small, complex vascular structures and easily remove internal support material.

TissueMatrix™
Sophisticated material configurations make models that feel and behave like native organ tissue when force is applied.

Anatomy families

Blood vessels | Structural heart | Musculoskeletal | General anatomy

[1] Severseike, Leah et al., "Polyjet 3D Printing of Tissue-Mimicking Materials: How Well Can 3D Printed Synthetic Myocardium Replicate Mechanical Properties of Organic Myocardium?," *bioRxiv*, 2019, doi.org/10.1101/825794.

[2] Dahan, Gal, "Synthetic Bones vs. Human Bones for Screws Testing: A Literature Survey," *In progress*, 2020.

[3] Sparks, Adam et al., "Digital Anatomy Printing (DAP): A Direct Characterization of DAP Materials for Use as Compliant 3D-Printer Arteries using Intravascular Ultrasound (IVUS)," The Jacobs Institute, *Submitted for publication,* 2020.