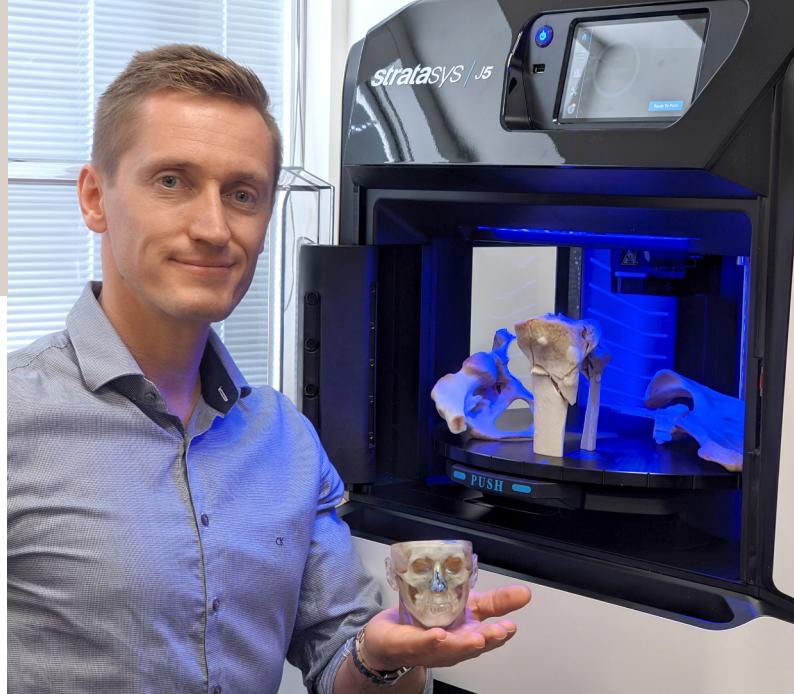


A 3D print is worth a thousand pictures

J5 MediJet™ gives University Hospital of Southern Denmark, Esbjerg new pathway to improve presurgical planning and research.



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Surgeons are already saying things like, ‘we don’t want to do this surgery without a 3D printed guide.’”

Michael Boelstoft Holte

Associate Professor, Ph.D., M.Sc.
Faculty of Health Sciences,
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Michael Holte, PhD, is the head of the 3D lab, which provides patient-specific 3D printed solutions for several departments at the University Hospital of Southern Denmark, Esbjerg. Before the 3D lab was established the hospital's Department of Oral and Maxillofacial Surgery worked with a third-party service bureau to prepare 3D models to assist in planning for corrective jaw surgeries at the hospital. As the surgeon's requests for 3D printed medical models grew over time, the department found it difficult to sustain the business model both from a budget standpoint and managing the iterative process of revising 3D models in a timely manner.

The head of the Department of Oral and Maxillofacial Surgery reached out to Prof. Holte, who was working as an associate professor at a local university at the time, to think about a solution. Because they needed a 3D printing system that they could use on a daily basis, Prof. Holte suggested that the hospital establish an in-house lab to manage model production effectively.

The new in-house lab, which is now 3D Lab Denmark, began to produce single-material models with an SLA printer in the beginning of 2018. The models were sufficiently detailed and surgeons in other departments around the hospital began to ask the lab to print models for them, too. Today, 3D Lab Denmark has produced more than a thousand 3D printed parts.

"It became an innovation hub," Prof. Holte said. "Surgeons had ideas that fostered dialogue and created new areas for 3D printing."

Over time, Prof. Holte and his team realized that a single-material printer couldn't meet the demand to print more advanced models such as hollow models, multi-colored models, multi-material or more realistic prints for better research and surgical planning.

Enter the J5 MediJet

In their search for a more advanced 3D printer, the lab found the Stratasys J5 MediJet PolyJet printer. The J5 MediJet has allowed the lab to produce surgical guides with biocompatible and sterilizable materials, it prints models with highly detailed surfaces or with varying elasticity and softness.

In the short time the hospital has had the MediJet, clinical staff have used the 3D models for presurgical planning, surgical guides, patient education, and research. It's not just the department of Oral and Maxillofacial Surgery that's asking for prints, either—the orthopedics and ENT departments are asking for models frequently, too.

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People say a picture is worth a thousand words, but a 3D print is worth a thousand pictures. The possibilities are endless.”

Michael Boelstoft Holte, Ph.D., M.Sc.

Improving outcomes in orthopedic procedures

Researchers at the hospital are currently studying the best method for planning and printing positional guides for total shoulder arthroplasty. Placement of the glenoid implant can deviate quite a bit from the anatomical orientation, and 3D printing the guide helps the surgeon place the prosthesis in the shoulder more precisely.

The study will help identify the most efficient workflow for printing surgical guides. Researchers are also evaluating whether 3D printing the surgical guides makes a significant difference in improving surgical outcomes for patients—and according to Prof. Holte, surgeons at the Hospital are starting to rely on the 3D-printed guides.

Looking into the future, Prof. Holte is exploring additional areas of interest such as automation and artificial intelligence, training and education, incorporating 3D printing with additional technological advancements. “There are many possibilities. Our knowledge is developing through interaction with clinical staff and networking through different professional forums. 3D labs all around the world are looking into this development. Even in Denmark we see additional 3D labs and 3D printing centers popping up and it’s interesting to see, it is becoming more prevalent.”

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J5 MediJet:

The all-in-one medical printer.

Advanced capabilities in a compact footprint.

Multi-material, full color printing allow you to create brilliantly vivid anatomical models, drilling and cutting guides that are sterilizable and biocompatible, with a certified workflow — all on one platform.

Improved point-of-care planning.

The use of patient-specific 3D printed medical models for pre-surgical planning improves patient outcomes by reducing complications, decreasing operation time and length of hospital stays.

Enhanced training and education programs.

Print patient-specific models on demand for education programs. Scale up product demonstrations when training field staff and physicians on a new medical device.

Protech is Stratasys's Nordic supplier of 3D Printers and CAD/CAM Systems. Since 1993, Protech has pioneered 3D printing technology in the Nordics by helping manufacturers from all industries find efficient solutions that optimize their production time and reduce costs. info@protech.dk

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