# CHU de Brest: Improving Surgical Planning for Patient-specific

Case Study

stratasys

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Samuel Guigo

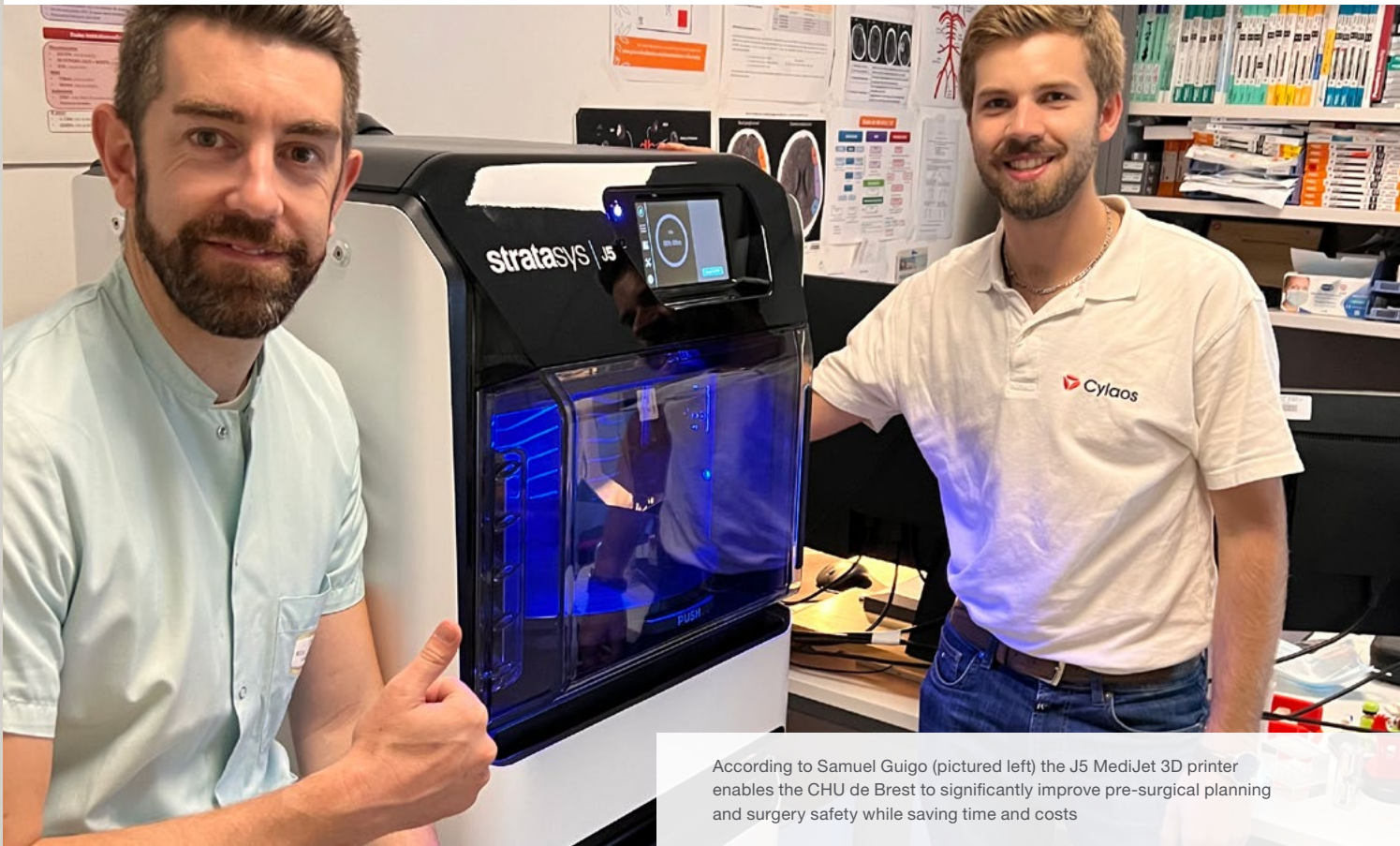
**Radiology and 3D printing technician at the CHU de Brest**

# CHU de Brest improves surgical planning with Stratasys 3D printing technology for patient-specific anatomic models

J5 MediJet 3D printer's multi-material, multi-color capabilities enable surgeons to produce realistic models to plan complex surgical procedures, improving planning, training and patient outcomes.

France-based University Hospital of Brest (CHU de Brest) is witnessing substantial improvements in pre-surgical planning procedures following the implementation of a new 3D printer by Stratasys' partner-reseller, Cylaos. The installation gives surgeons highly accurate and detailed 360-degree patient-specific anatomic models prior to the actual operation, which may improve surgical risks and reduce time in the operation time.

According to Samuel Guigo, radiology and 3D printing technician at the CHU, the realistic sophistication of the 3D printed models produced with the all-in-one, multi-material, multi-color J5 MediJet over previous single-material, single-color options is transformational and sets a new standard for medical modelling.




According to Samuel Guigo (pictured left) the J5 MediJet 3D printer enables the CHU de Brest to significantly improve pre-surgical planning and surgery safety while saving time and costs

"The accuracy we now enjoy with the J5 3D printed models means our surgeons are far better equipped and prepared before going into theater, which significantly and quantifiably reduces surgical-related risks through improved safety," he explains.

Guigo adds: "When preparing a vascular surgery for example, millimetric precision is mandatory. With the J5 MediJet, not only can we achieve this, but we have the flexibility to re-print the models to iterate and achieve optimal results, reproducing them with complete consistency, as required. We were simply unable to do this previously."

The use of Stratasys' advanced 3D printing technology is, explains Guigo, a crucial factor contributing to the quality of the anatomical models the hospital can produce. This, he says, is underscored by the ElasticoTM photopolymer material.

"We can produce models on the MediJet with far greater realism than our other 3D printing technologies allow. With the Elastico material, for example, the haptic feeling and surface smoothness replicate the patient's soft arteries much more closely," he says.

## In-house Stratasys capability addresses quality issues and supports capacity requirements

The short-comings in the hospital's existing alternative technologies also meant that the production of some models had to previously be out-sourced to external providers. Nevertheless, with a level of quality that fell short of the hospital's requirements, together with a mounting need to better manage increasing volumes, the acquisition of the in-house J5 MediJet made logical business sense.

The J5 MediJet's multi-material multi-color 3D printing capability enables the production of ultra-realistic models for pre-surgery preparation and training

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# Improving Training and Patient Care

Beyond pre-surgical preparation, the use of patient-specific 3D printed medical models produced on the J5 MediJet for on-demand training can improve patient outcomes by reducing complications and decreasing overall recovery time and length of hospital stay. In addition, with a highly accurate patient-specific 3D printed medical model, surgeons can better explain specific pathologies and procedures to patients prior to surgery, which has been proven to improve a patient's therapeutic understanding and satisfaction.

"The MediJet means that we're winning in every area", concludes Guigo. "We have greater management of growth requirements and have addressed quality issues, while also improving processes and educational practices."

The CHU de Brest's installation of the J5 MediJet was achieved thanks to support from the hospital's Innoveo Endowment Fund, which is designed to support projects that improve the care, quality of life and comfort of patients. Since its installation, the use of the J5 MediJet has rapidly expanded to different hospital departments, including Interventional neuroradiology, orthopedic surgery, vascular surgery, neurosurgery, as well as to biomedical services.

Additionally, as part of the government's strategy for accelerating digital health, W.INN – the innovation center established by the CHU de Brest in 2021 – was recently designated as a Third-Party Experimentation Centre. As such, the CHU is further positioned as a key player in medical innovation at the local, regional and national level.

Looking ahead, the CHU's next aim is to set up a dedicated 3D printing arm that will address the needs of the hospital's departments, research team, and training. With the hospital focused on championing the technology's general use within the medical sector, there is also a vision for producing 3D printed anatomical models for other hospitals, as well as for biomedical engineering schools.

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