# *Keynote : Structuring a 3D printing platform in a hospital: Experience at Brest University Hospital*


**Samuel GUIGO – W.Print Coordinator – 3D Printing LAB**

**Clinical Research and Innovation department**

**Brest University Hospital - FRANCE**






Congrès / Congress

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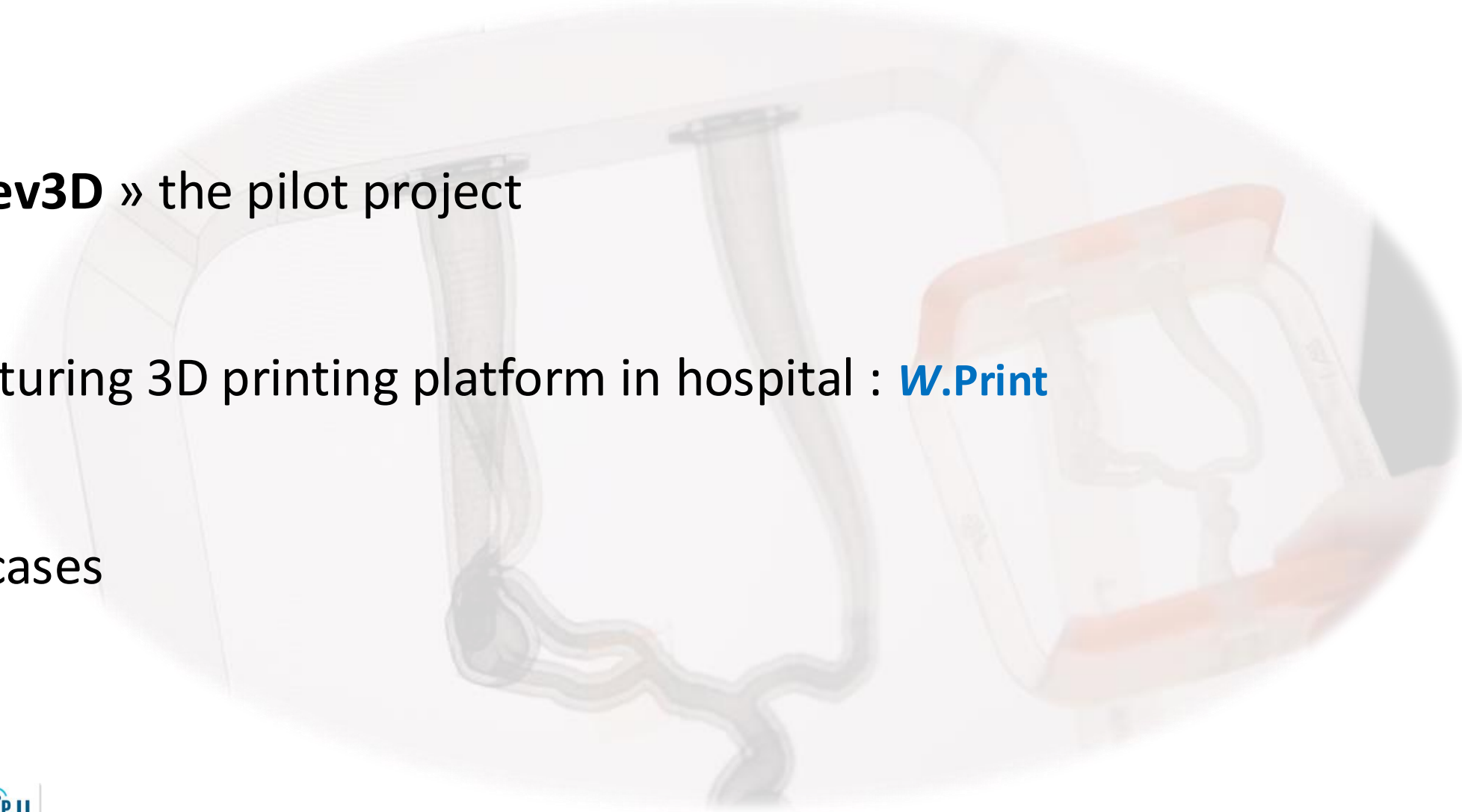
INNOVATIVE POLYMERS FOR HEALTHCARE

Institut Charles Sadron, Strasbourg

25-26 mars
25-26 march
2026

**With the support of:**

# Summary



1. « **Anev3D** » the pilot project

2. Structuring 3D printing platform in hospital : ***W*.Print**

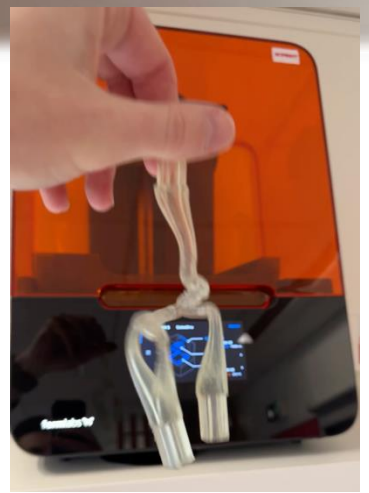
3. USE cases

# ANEV3D, the pilot project

- **Research project**: *"Evaluation of the interest of a simulated procedure performed on a printed model in the endovascular treatment of carotid-sylvian aneurysms »*
- **70k** research fund in 2019
- Print a **specific patient anatomical** model from imaging data
- **Using 80A Flexible Resin (light-curing elastomer)** on Formlabs SLA Technology (FORM 3)
- Do a **Preoperative session** in real treatment condition

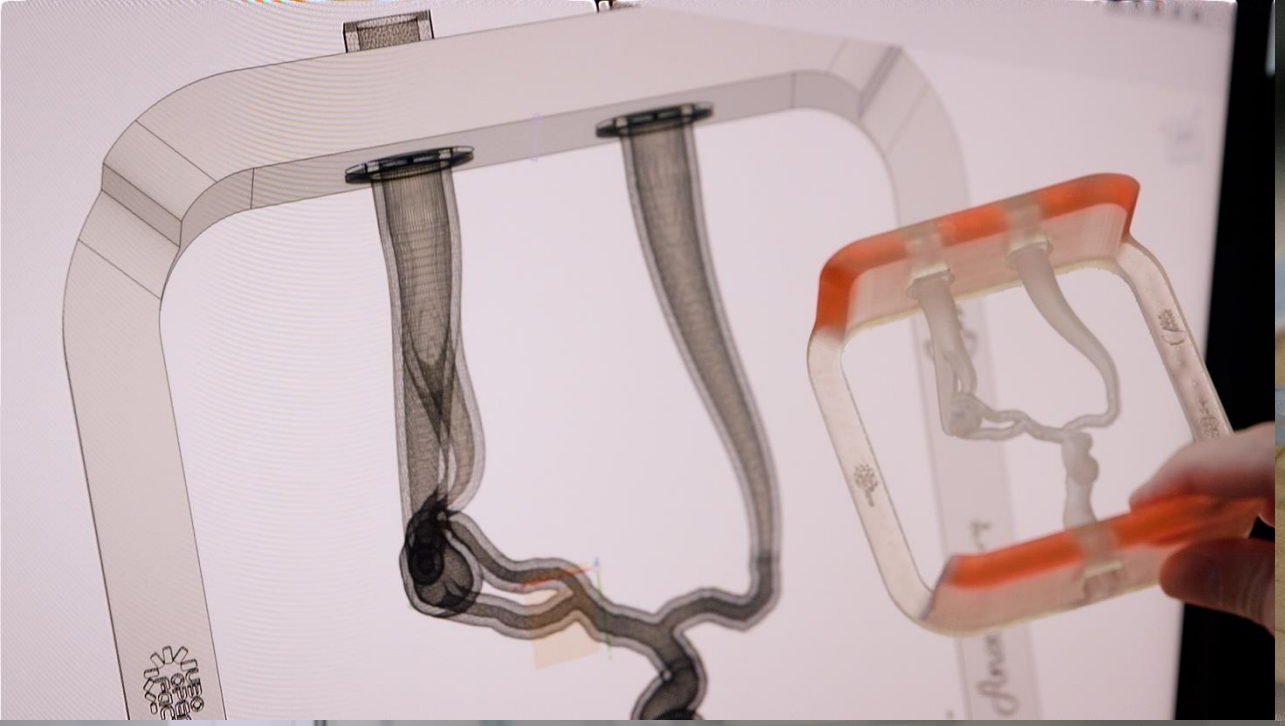


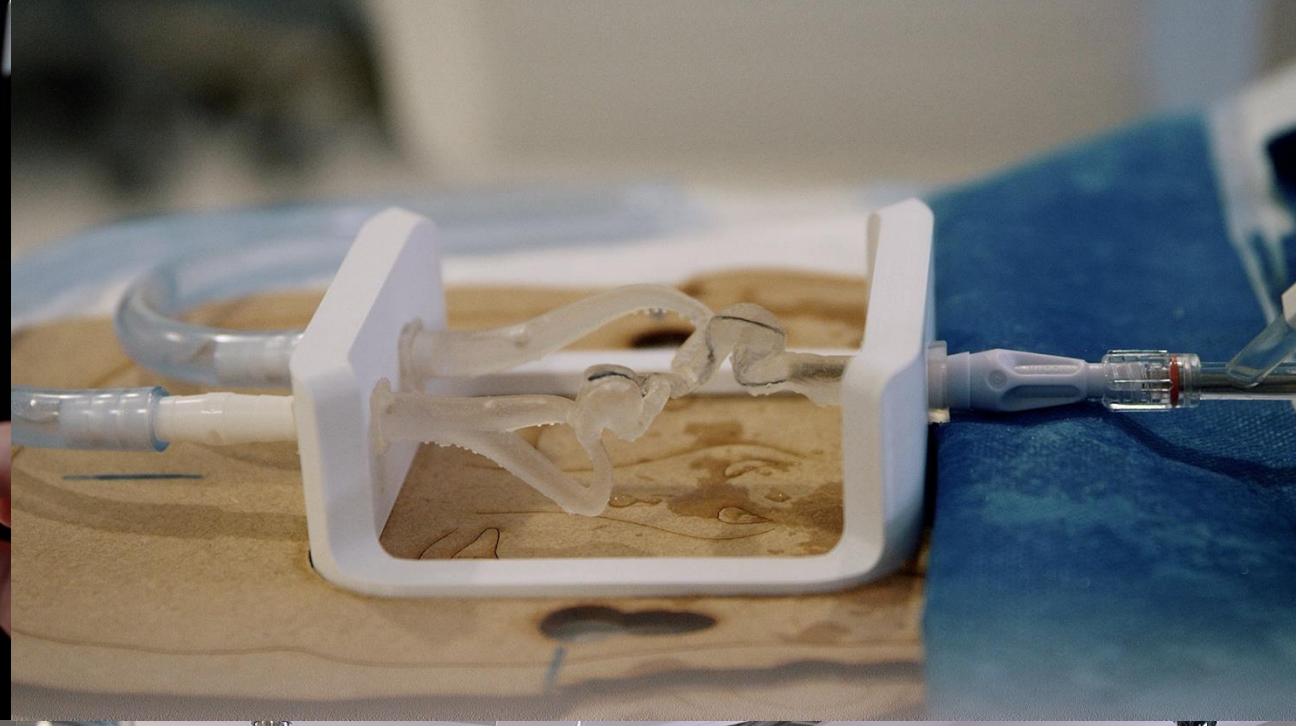




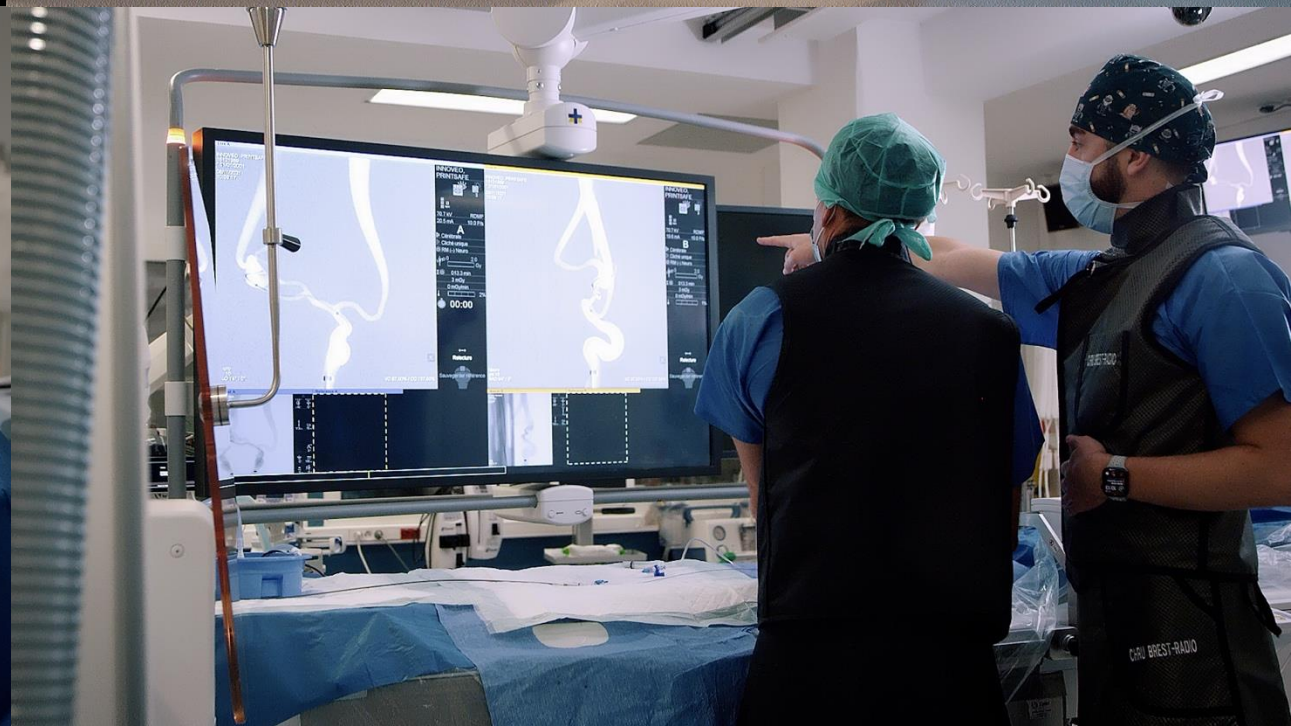


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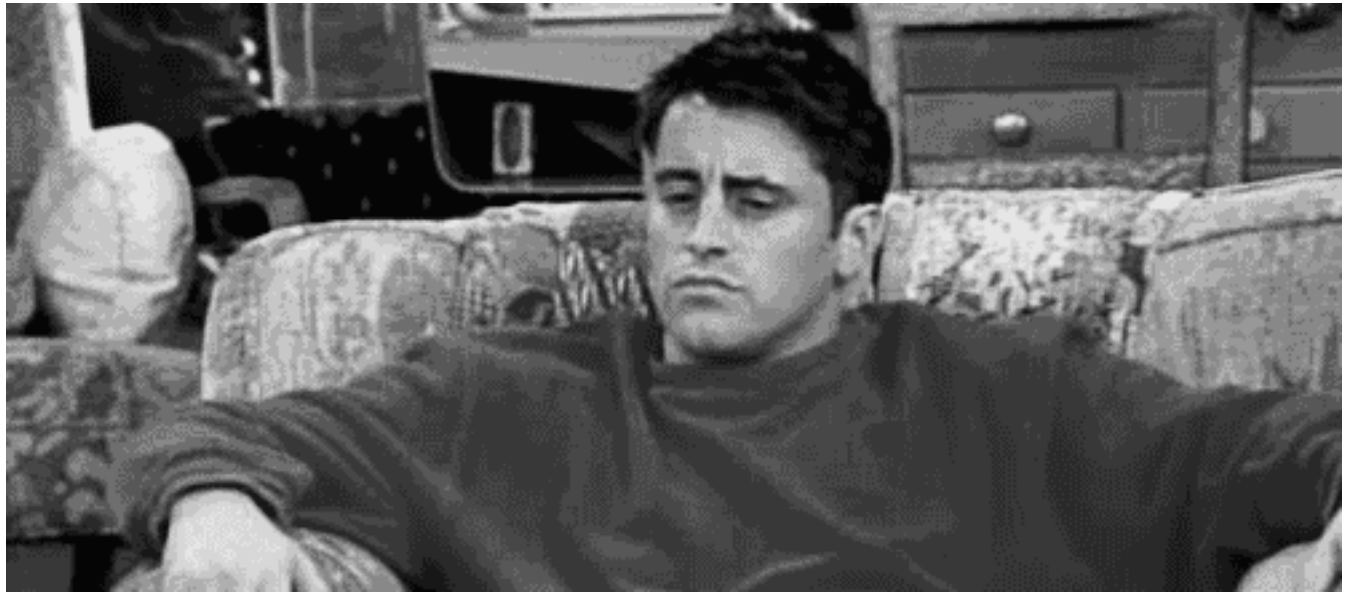





PHILIPS


CHRU BREST-RADIO

# And why not develop a real 3D printing service in hospitals, for everyone, for other medical speciality ?



# W.PRINT

## La plateforme d'impression 3D du CHU de Brest

CHU BREST
CENTRE HOSPITALIER UNIVERSITAIRE




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# Structuring 3D printing platform in hospital

## ECOSYSTEME W.PRINT

### PORTFOLIO



**Anatomical models**
Simulation,
Teaching, Pedagogy



**CONCEPTION - CAO**
Modeling Co-design



**Clinical research**
R&D Innovative
Tools

**W.PRINT**
La plateforme d'impression 3D du CHU de Brest



**Medical devices**
Dental guide



**Education patient**
Technical aids
Custom-made tools



**Biomedical - Non-medical tools**
Replication Repair

# Structuring 3D printing platform in hospital

## ECOSYSTEME WPRINT

### USERS



**Medical staff**
Doctors, interns, externs, SAMU (Emergency Medical Service)



**Logistics sector**
Restoration, bio-cleaning, purchase



**Paramedical staff**
Radiographer, occupational therapist, nurses, nursing assistants

**W.PRINT**
La plateforme d'impression 3D du CHU de Brest



**Biomedical sector**
Engineer, workshop

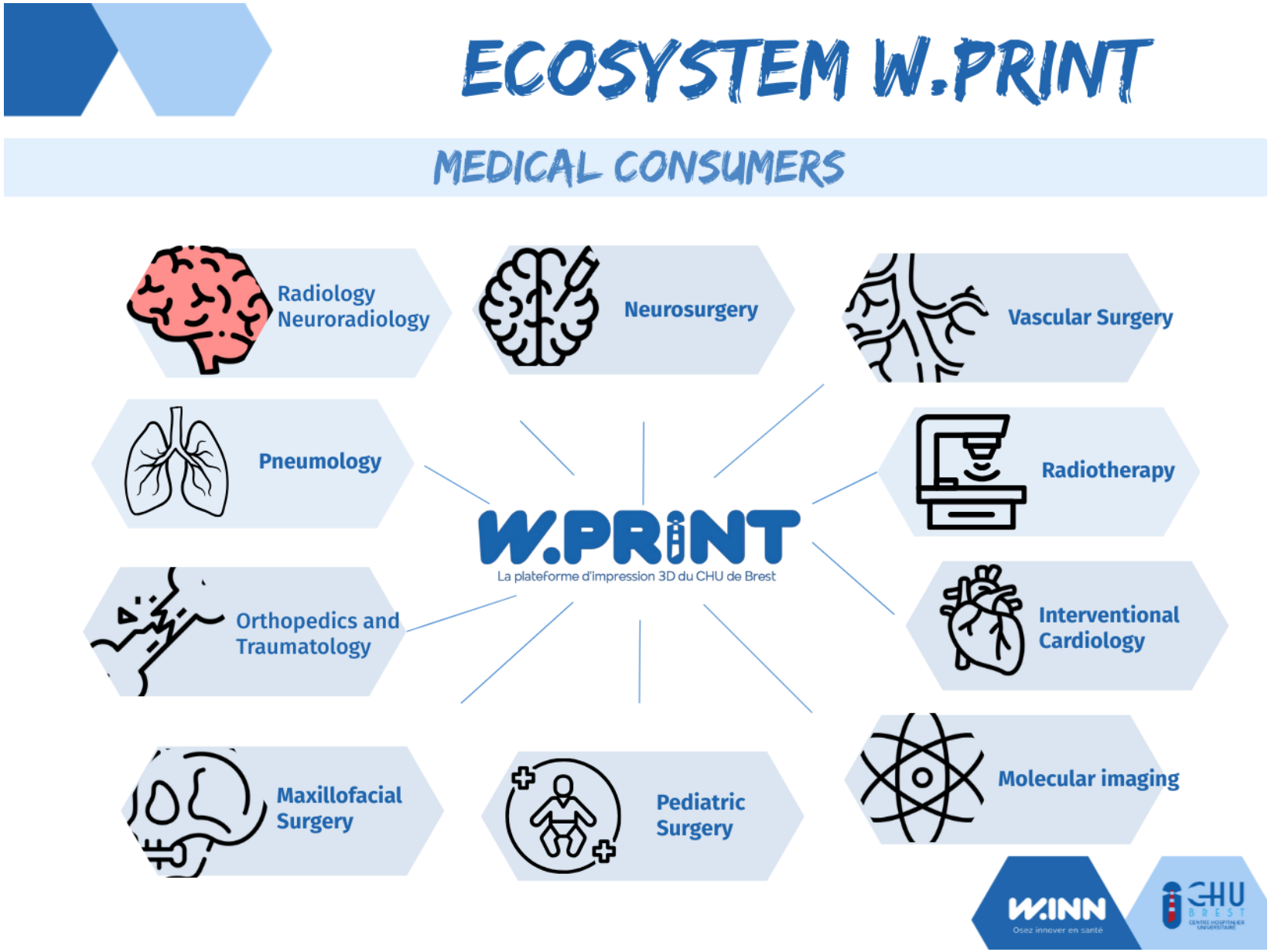


**Administrative staff**
Secretaries, IT, information systems, reception, management



**Patients and users of the University Hospital**

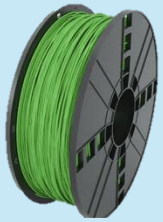
# Structuring 3D printing platform in hospital



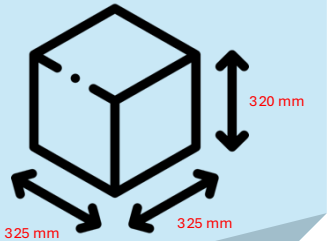
# Structuring 3D printing platform in hospital



## FDM



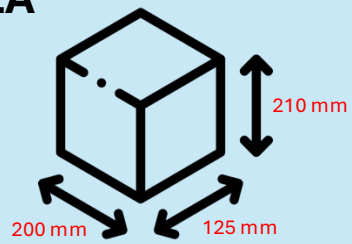
- Filament Deposition
- Simple technology
- Mono material
- Low consumable cost
- Prototyping +++




Bambu Lab



## SLA



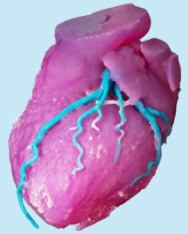

- Stereolithography
- Liquid resin
- Materials dedicated to the medical sector
- Flexible / Elastic / Transparent
- Biocompatible / Sterilizable



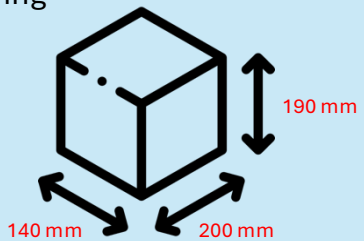
formlabs



## POLYJET



- Material Jet – UV Curing
- Digital Materials
- Multi Colors
- Flexible / Elastic
- Biocompatible / Sterilizable




stratasys

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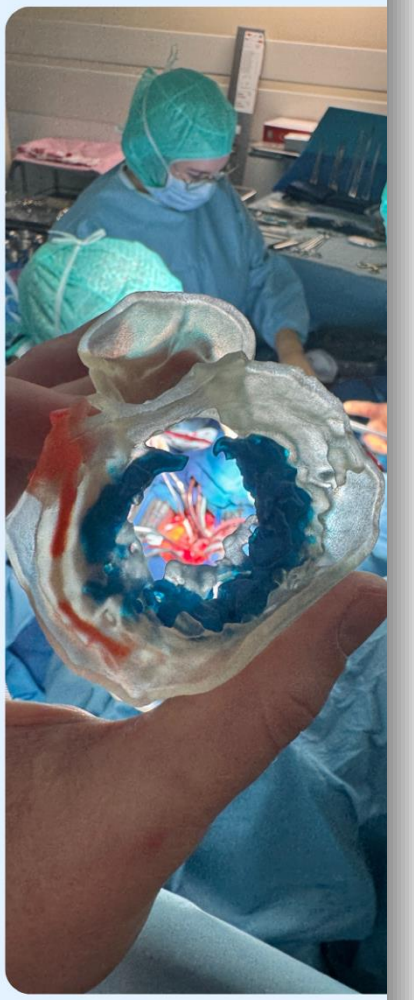
# Structuring 3D printing platform in hospital

W.INN
Osez innover en santé

W.PRINT
La plateforme d'impression 3D du CHU de Brest

## 2025, In figures

**65K**
savings achieved at the University Hospital in the production of non-critical spare parts and custom design



**80**
3D printing projects
(CHU and outside CHU)

**3**
Research project submissions
(PREPS, ANR, BTPR)

**4**
Publications in scientific journals



**16 000€**
recipe
in service provision and transfer of UF

**3**
New FDM and SLA printers

# Regulatory framework

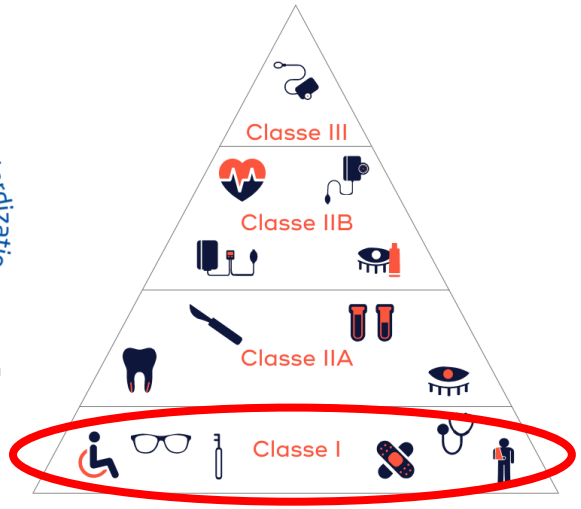
## In progress of certification and quality management for ISO 13485:2016

*(By the end of S2 – 2026)*

## Manufacturer of Class 1 Medical Devices – "In-House" – Tailor-made for anatomical model

*(Art 5.5 MDR)*

International Organization for Standardization
ISO
13485
Quality Management System




**ARTICLE 5.5 of the EU Medical Device Regulation (MDR 2017/745)**

*These devices must be:*

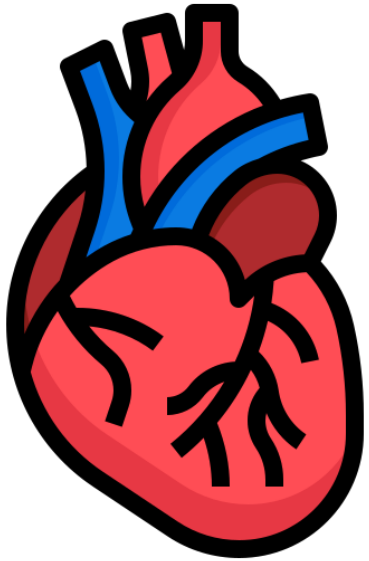
- ***Manufactured and used only within the same health institution***
- ***Not transferred to another legal entity***
- ***Used to meet specific patient needs*** *that cannot be met by an equivalent CE-marked device available on the market*

*The health institution must:*

- *Implement an* ***appropriate quality management system***
- ***Document manufacturing and design processes***
- ***Justify the absence of an equivalent commercial device***
- *Ensure devices meet* ***general safety and performance requirements*** *(Annex I)*
- ***Monitor clinical use****, manage risks, and take corrective actions if needed*
- *Provide* ***publicly available information*** *on the device (description, purpose, safety)*

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# USE CASES

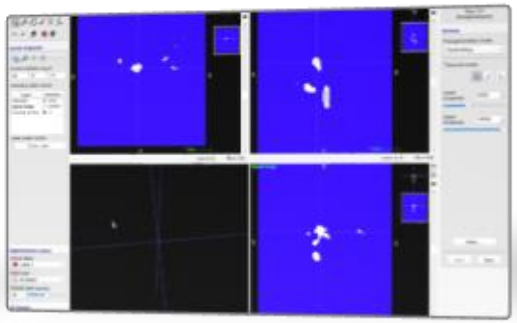


# Digital workflow for 3D printed anatomical models



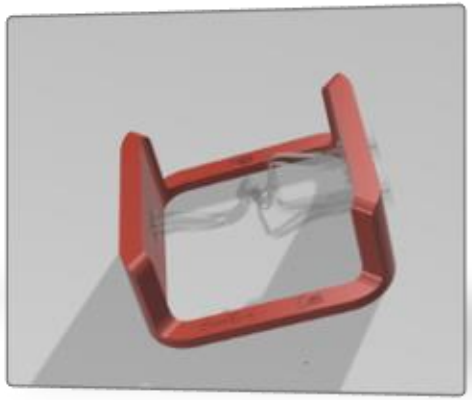
3D DICOM Files from patient CT/MR

1



DICOM Segmentation .STL export

2



C.A.D Files and 3D conception

3

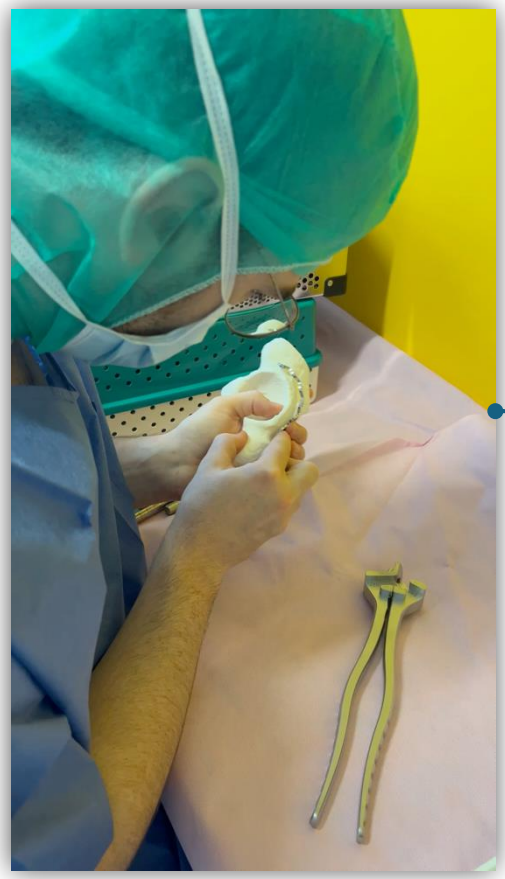


3D PRINTING and post-processing

4

# USE CASES

Anatomical model for preoperative simulation / preparation



**Traumatology**

Custom-made / Patient spécifique implant using 3D model

**FDM** Technologie - PLA



**Neurosurgery**

Planning of the placement of a clip for the treatment of an IC - anerysm

**POLYJET** - Multi-material

**Medical 3D Printing Cost-Savings in Orthopedic and Maxillofacial Surgery: Cost Analysis of Operating Room Time Saved with 3D Printed Anatomic Models and Surgical Guides**

David H Ballard [1], Patrick Mills [2], Richard Duszak Jr [3], Jeffery A Weisman [4], Frank J Rybicki [5], Pamela K Woodard [6]

Affiliations + expand

PMID: 31542197 PMCID: PMC7078060 DOI: 10.1016/j.acra.2019.08.011

**It is estimated that 60/70 min of operating time will be saved**

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# USE CASES

Anatomical model for teaching, pedagogy

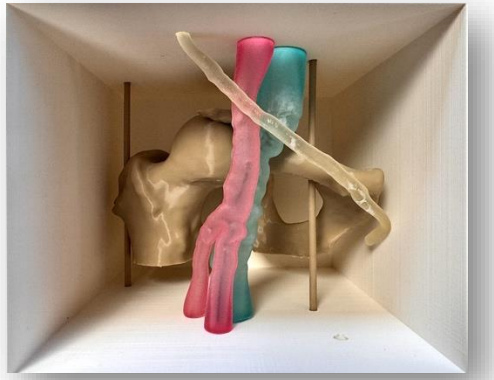




**Radiology**

Ultrasound-guided arterial puncture training

**POLYJET** - Multi-material (Elastico / Draft)





**Hematology**

Lumbar puncture training

**FDM** - Multi-material (PLA/TPU)

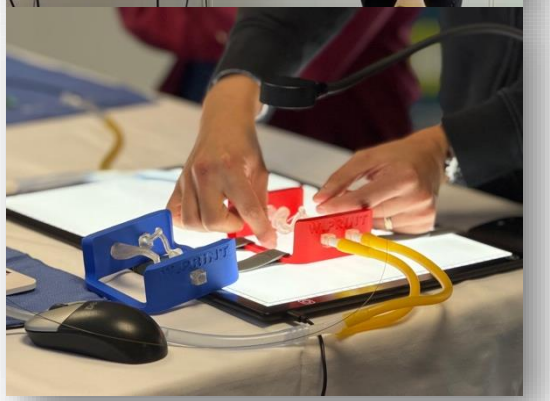
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# USE CASES

Anatomical model for teaching, pedagogy





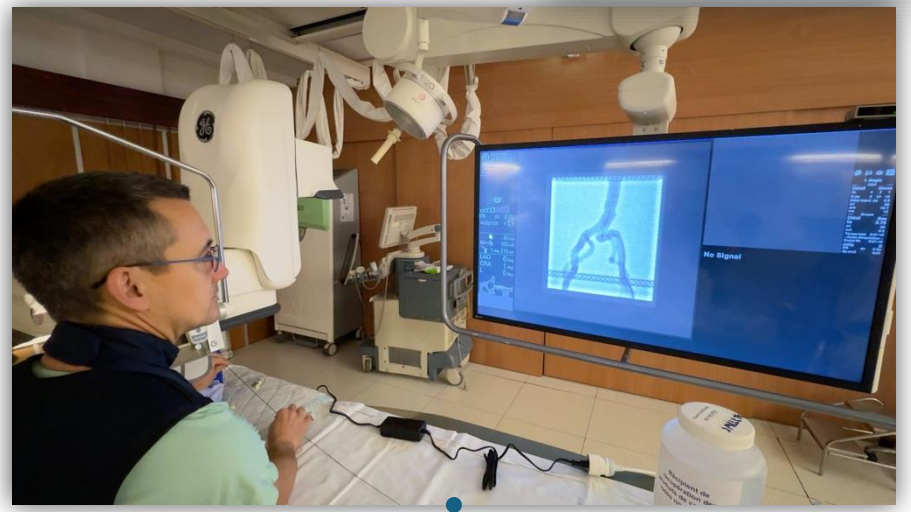


**Radiology**

Training for aneurysm embolisation

**SLA** (Flex 80A)





**Radiology**

Training of pelvic arteries cross-over catehterism

**SLA** (Flex 80A)

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# USE CASES

Anatomical model for therapeutic education with patient





**Paediatric oncology**

Explanation of the placement of an implantable port for chemotherapy

**POLYJET**





**Pneumology**

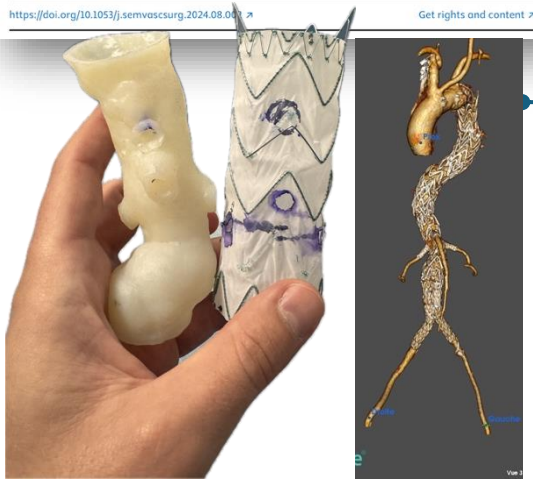
Pulmonary fibrosis

**FDM - Multi-material (PLA / TPU) and POLYJET (texture)**

# USE CASES

Anatomical model for research and scientific publication

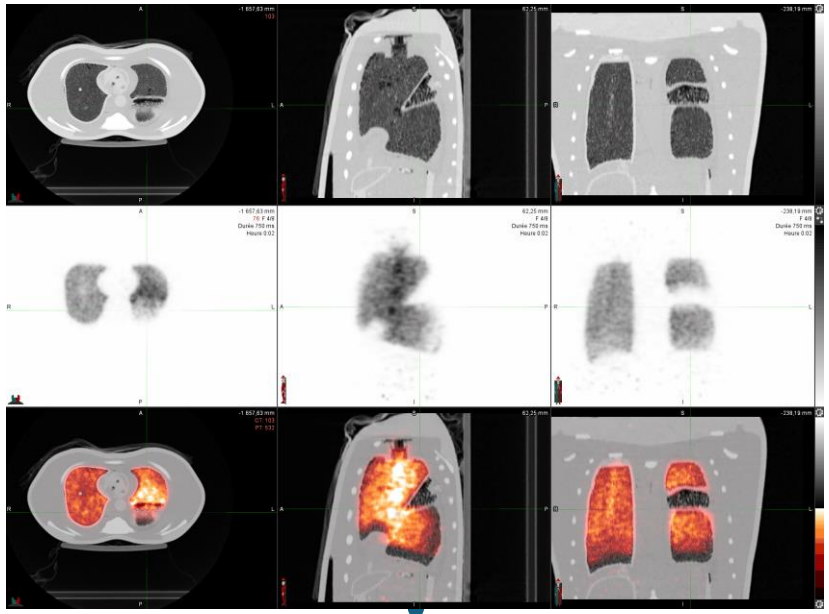


## Vascular surgery

Use of specific patient 3D printed model for the realization of home-made aortic prosthesis

**POLYJET / SLA**





## Molecular Imaging

Multi-modality evaluation for the detection of pulmonary embolism

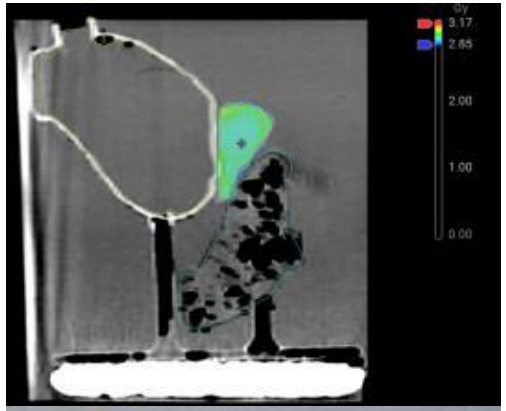
**SLS (PA12) - Formlabs**



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# USE CASES

Anatomical model for research and scientific publication

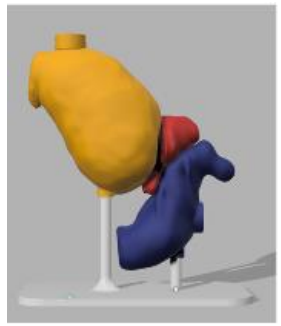




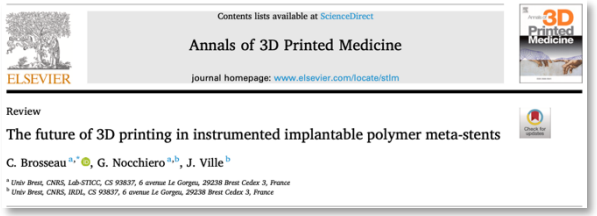

## Radiophysics

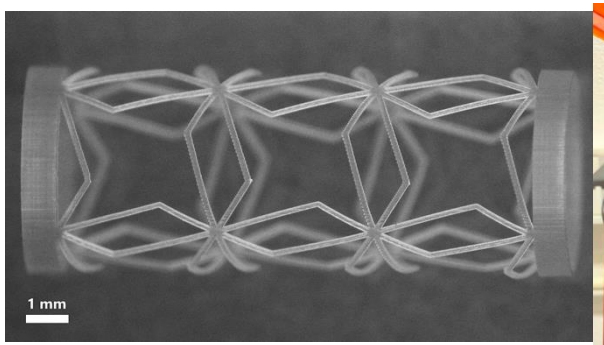
3D printed phantom for the implementation of adpatative prostate radiotherapy

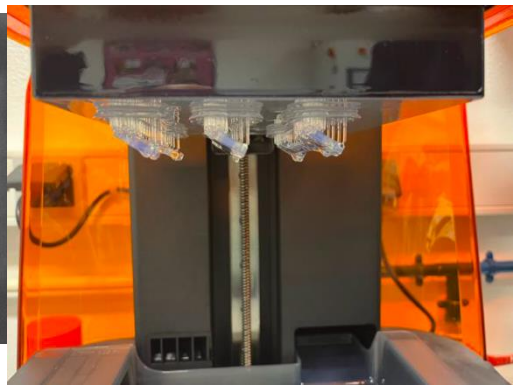
**FDM multi-éléments**

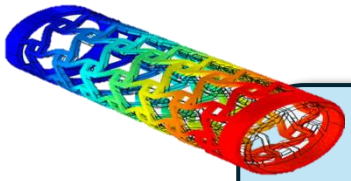


anr





## Radiology

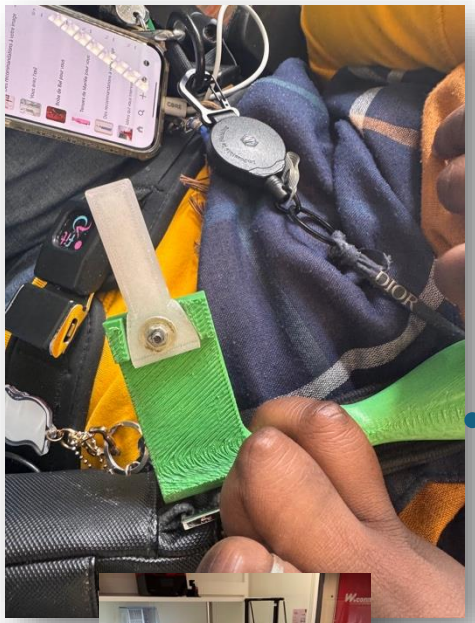
Design of a vascular stent instrumented by 3D printing of a meta-material architecture optimized by mechanical-biological simulation

**SLA - Formlabs**

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# USE CASES

Personalised technical aids for patients with disabilities



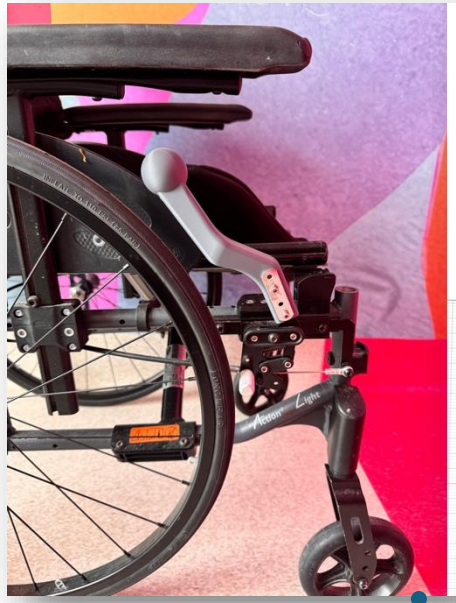


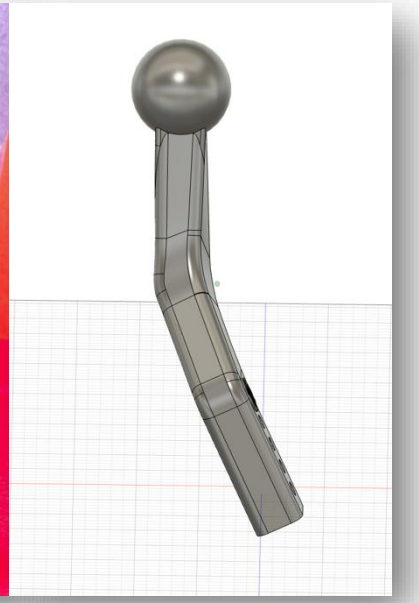
Angulated elevator key holder

Patient with cerebral palsy

**FDM (PLA and PC)**





Double angled brake extension for manual wheelchair

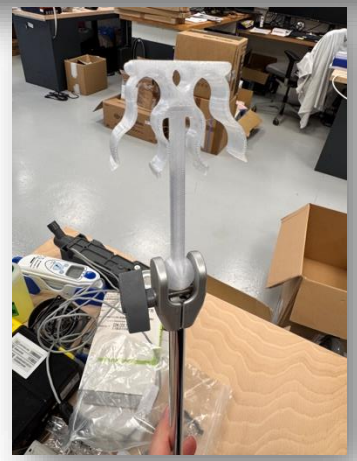
**FDM (ABS)**

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# USE CASES

Reverse engineering of non-critical and unavailable spare parts





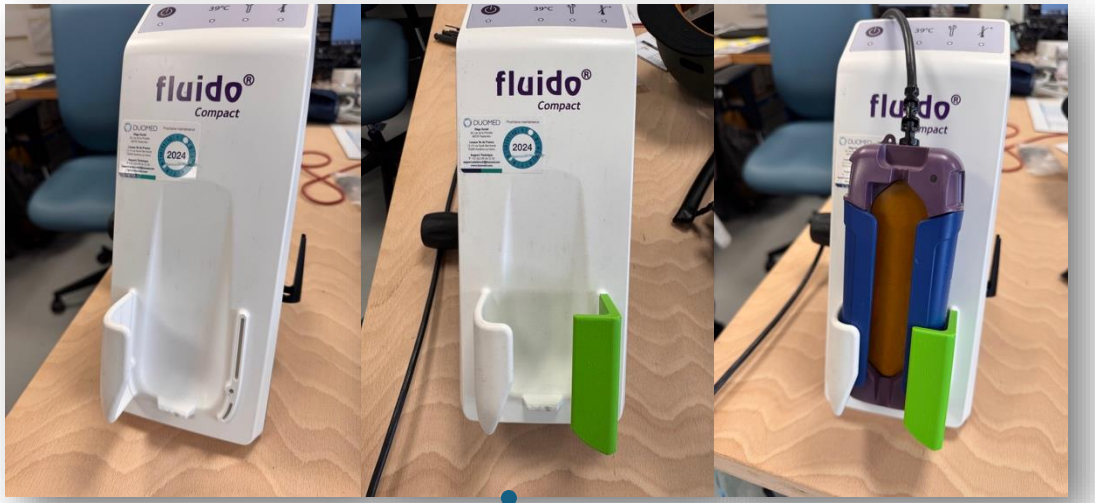
Intubation tube support in an intensive care unit

**FDM (PC)**

Cost of the complete system: **2850**€

Cost of the 3D printed part in-house production : **55€**

**Δ savings cost for the hospital: 2812,59 €**




Support part on infusion heater

**FDM (ABS)**

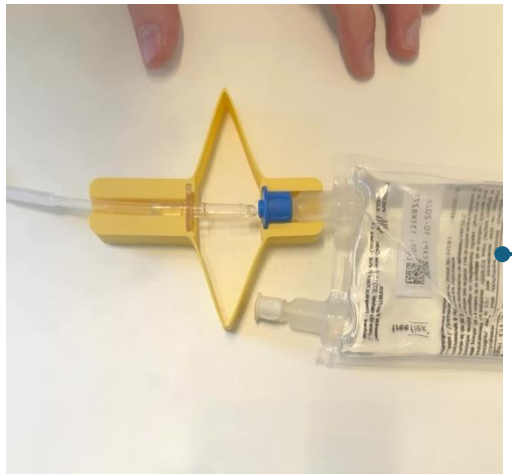
Delay for delivery of the complete system: 8 weeks

**Time to return to service thanks to 3D printing: 6 hours**

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# USE CASES

Custom Design on demand



Tools for nurses for infusion preparation

**FDM (PETG)**







Call bell for patients with Charcot's disease

**FDM (ABS)**

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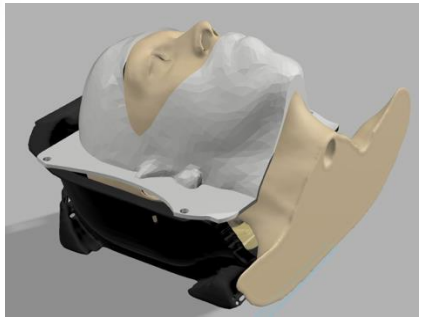
# USE CASES

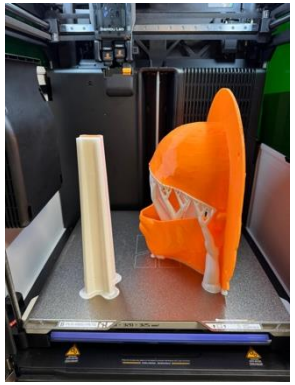
## Custom Design on demand



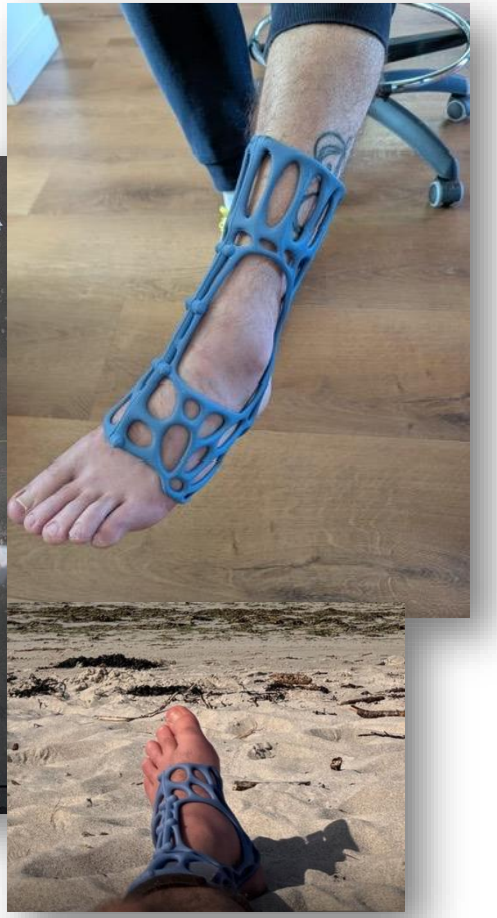

Custom Compression Mask for Brain Radiation Therapy

**FDM (TPU)**







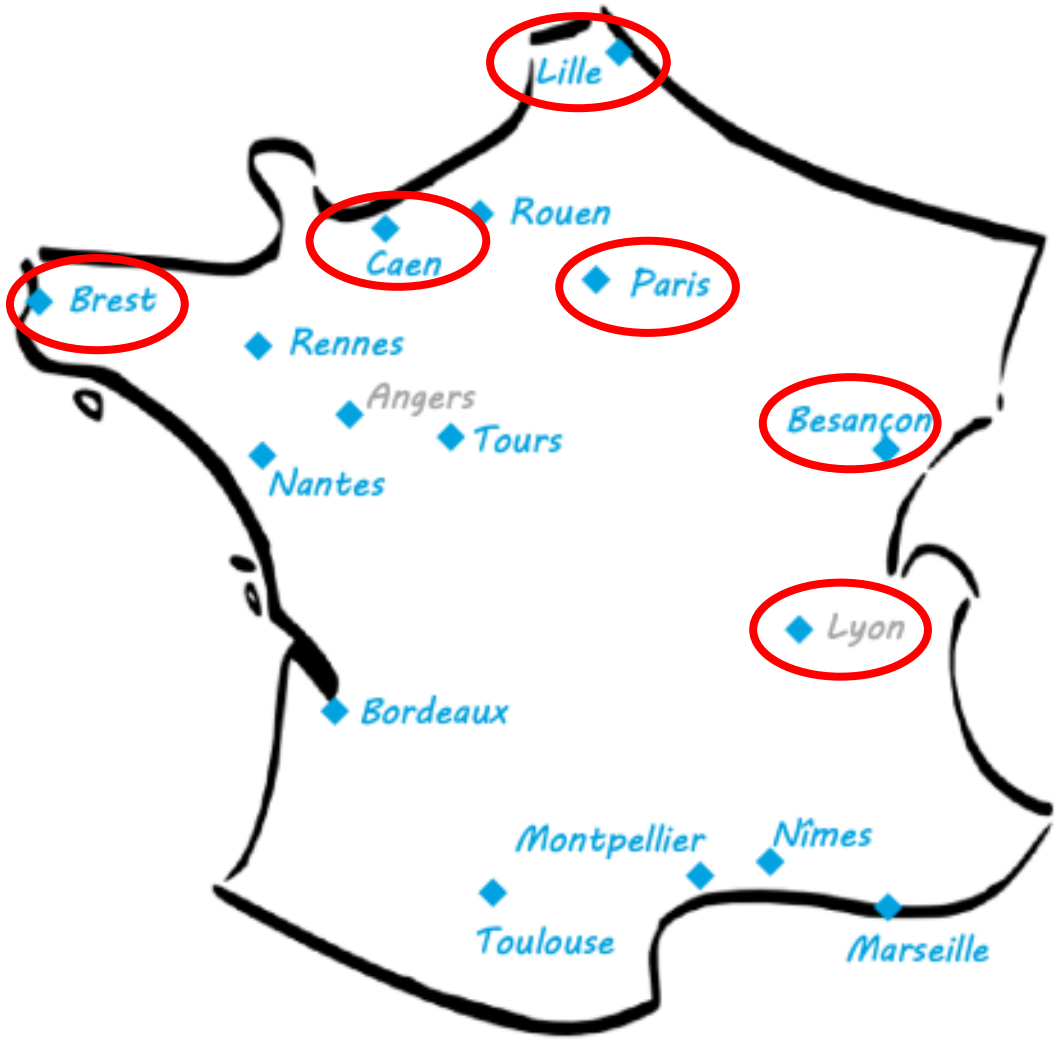


Personalized orthosis for the management of a ruptured Achilles tendon

**FDM (PLA-CF)**

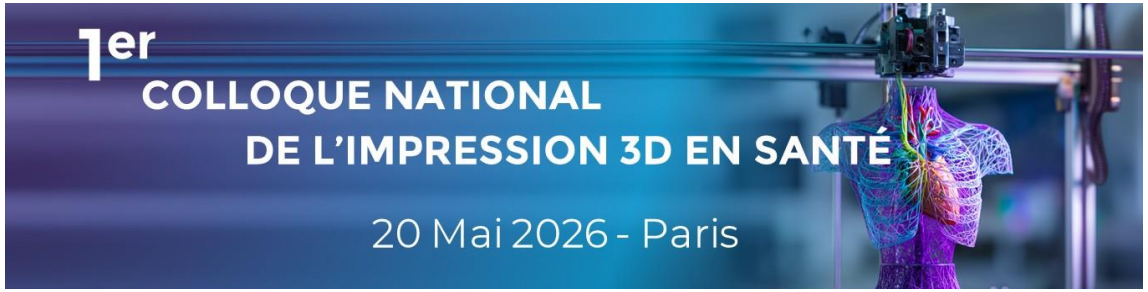
Congrès / Congress
IP4H
INNOVATIVE POLYMERS FOR HEALTHCARE
Institut Charles Sadron, Strasbourg
25-26 mars
25-26 march
2026

# 3D French network of Hospital 3D printing lab




- Currently **6 laboratories in operation / open**
- **32** University Hospitals
- Many others **waiting for openings** (Nantes, Rouen, Strasbourg …)
- **First French 3D Printing Healthcare Congress** will take place on May 20, 2026 in Paris

CHU FRANCE
DIRECTEURS GÉNÉRAUX






# Thank you for your attention !

W.PRINT

La plateforme d'impression 3D du CHU de Brest

W.INN

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