

# Surgical Planning Successfully Using 3D Printed Bone Models



*“ Raise3D printer is extremely reliable and handy. The printing result is quite good, especially with ABS.”*

– Louis\_Founder

Persona Surgery Modeling Co., Ltd. utilizes its medical and engineering knowledge to provide customized health care services. This company specializes in converting medical images into 3D models with advanced 3D CAD modeling, automated customized design, 3D scanning, and 3D printing technologies. With the help of [RaiseN2](#) and [RaiseN2 Plus](#) printers, Persona produces large scale 3D printed bone models for local hospitals. Louis, one of the Persona founders, has a medical education background and personally understands the benefits that his company provides in helping the need of surgery observation models for surgeons.



**Surgical procedures are challenging, and due to the complexity of the human body, each procedure is unique. By creating 3D printing bone structures, Persona Surgery Model can provide the surgeons with the data required to successfully plan, test, and perform surgical operations.**

Before incorporating 3D printing, surgeons relied on experience and computer images to understand the procedure.

**By applying Raise 3D printers for the creation of 3D printed medical models the company was able to:**

1. Perform surgical planning digitally in preparation for surgical procedures.
2. Create mock up operations physically with the usage of trustworthy full-scale printed parts.
3. Test implants prior to inserting them into the body.

**Successful results after the implementation of Raise3D Printers:**

1. Successful implant fit of 95%
2. Reduced surgery time by 25%-50%.

**Company:** Persona Surgery Modelling Co., Ltd.

**Industry:** Health Care, Surgical, Medical

**Interviewee:** Louis

**Title:** Founder

## What is The Process to Create 3D Printed Medical Models with the Use of 3D Printing?

1. CT/MRI scanning
2. Computer aided surgical planning
3. Computer aided design.
4. Surgical simulation with RP models
5. Template guided surgery

To get the initial design and geometry, a CT/MRI scan is done to get the medical images. The surgery is then performed electronically and planned through computer aid. Once the procedure is decided, CAD design is used to create the replica of models for the surgical simulation. To Conclude, the procedure takes place by using the provided templates.

## What are The Challenges Faced when Creating Surgical Models Before Using 3D Printing?

Before the introduction of 3D printed pre-surgical models and other surgical templates, doctors could only perform rough surgical plans and could only simulate procedures 'in air' with hand motions. This type of planning relies heavily on the personal experience and professional knowledge of the surgeon. Hence, 2D/3D computer images aid the surgeon, but still don't provide physical means to simulate the surgery. This becomes a challenge when introducing more complicated cases.



*1:1 scale hip bones*

## What Solutions Can 3D Printing Provide in The Creation of Bone Surgical Models?

The large build volume and reliability of the [Raise3D printer](#) allows Persona to print large full-scale bones as well as the corresponding placeholders and templates such as hipbones, spines, tibia and



skulls. Without any variation in scale, the 1:1 model provides the surgeon with an accurate model to work with and reference pre-surgery.

[Raise3D printers](#) can capture the details of the unique bone structure and models can each be customized for each planned surgery. The fit testing of implants has also been implemented as the printer is able to maintain a 1:1 scale accuracy.

## Connect with Raise3D

Do you have a great 3D printing success story and think it would be cool to be featured on [www.raise3d.com](http://www.raise3d.com), we would love to learn more! Write to us at [inquiry@raise3d.com](mailto:inquiry@raise3d.com)

For more information about Raise3D printers and services, browse [our website](#), or [schedule a demo](#) with one of our 3D printing experts.