

SAVING FACE

3D Printing Helps Determine Treatment Protocols for Cranial / Facial Patients

“The models help us determine exactly how to treat the patient.”

— Lim Thiam Chye, National University Hospital
Aesthetic Plastic Surgery Centre

Lim Thiam Chye with 3D printed cranial / facial models

The doctors at the National University Hospital (NUH) in Singapore are no strangers to the benefits of 3D printing. Founded in 1985, the hospital functions as a one-stop center for medical, surgical and dental care, treating more than a million patients a year.

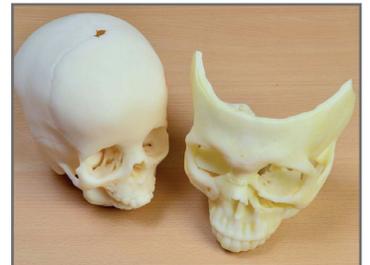
The hospital's Aesthetic Plastic Surgery Centre has been utilizing 3D printing technology since 2008 when its doctors were commissioning 3D models of their patients' heads as aids for elective surgery. But, there was a problem.

At the time, the printing of 3D models had to be outsourced to another part of the University, so it took at least a week – often longer – for doctors to receive the printed model. This meant that the clinic could only plan for surgeries with longer lead times. This was not an issue for elective procedures, but for patients who needed emergency surgery, it was not an option. As a result, surgeons often had to operate without the important information a 3D printed model could provide.

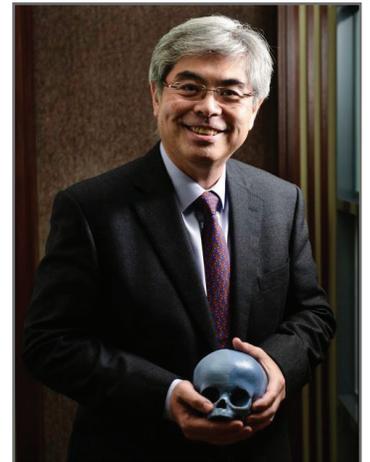
A Printer of Their Own

In 2012, the clinic purchased its own Stratasys® 3D Printer to shorten the time required to produce models.

“We decided to buy an Objet Eden™ 3D Printer because we were very pleased with the models we had received from our supplier who also used an Objet system,” said Lim Thiam Chye, Head and Senior Consultant of the Plastic, Reconstructive and Aesthetic Surgery Division at NUH. “When we tested the models, they were almost an exact fit with the patients' actual skulls.”



3D printed skulls produced on an Objet Eden 3D Printer at the surgical center



In particular, NUH liked the printer's ability to create smooth, accurate surfaces that the doctors needed, as well as the fact that it fit the clinic's budget. Lim assembled a team of medical experts who learned how to use the printer, putting the clinic in the unique position of having professional staff members who could operate the 3D technology without relying on the IT department.

Valued Transformation

Having immediate access to a 3D printer has transformed the way doctors work on both pre-planned cases and those that are in need of emergency treatment, says Lim.

Now, when an emergency patient arrives at the hospital, the affected area is scanned with proprietary 3D software developed by the University. The scans are then converted into data that is used by the 3D printer to create a replica model of the patient's skull. Models can be built in a matter of hours, with the length of time determined by the level of complexity needed.

Lim estimates that one trauma patient a day has been helped by a model produced by the Objet 3D Printer. Plans for the future include buying a second Stratasys system because the first one has paid so many dividends.

Lim explains, "You can see a lot in X-rays and picture the skull in your mind, but a physical model provides us with specific, visual 3D relationships and information we couldn't get otherwise. The models help us determine exactly how to treat the patient."

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