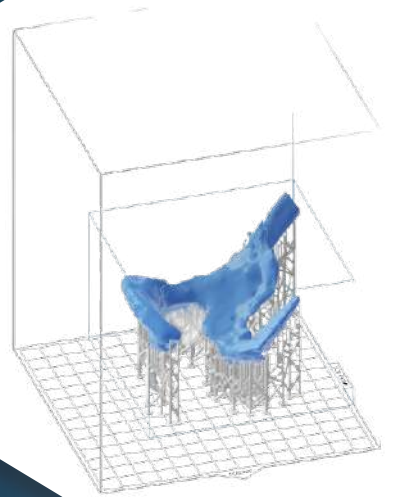


CUSTOM ANATOMICAL MODEL DEVELOPMENT AND DESIGN PROCESS



ORTHO-DESIGN

ORTHOPAEDIC INNOVATION

At Ortho-design™ we strive to create innovative medical devices and implants that allow medical professionals to provide optimum patient care. Ortho-design™ aims at bridging the gap between innovation, ease of use and affordability in the rapidly evolving medical field. Our team of specialised engineers work alongside surgeons to create modern and effective health care products for all types of patients.

Our **mission** is aligned with South Africa's need for quality, locally manufactured products that perform at the highest standards. Using interdisciplinary skills, from medical professionals to certified manufacturers, we provide our customers with the ultimate solution.

Ortho-design™ is focused on using inter-disciplinary knowledge to create the most innovative, efficient and feasible medical solutions.

All our products are designed in conjunction with surgeons specialised in the particular field. Our R&D department provides several consulting partnerships with medical professionals to create innovatively engineered, yet user friendly biomedical devices.

Benefits

- **Pre-operative planning:**
Allows surgeons to physically assess the anatomy and frame, engineer or test a viable solution.
- **Understanding complex cases:**
3D anatomical models can provide surgeons with interactive illustrations of rare cases.
- **Reduced cost:**
Pre-operative planning reduces valuable time spent in theatre.
- **Reduced patient trauma:**
Shorter time spent in theatre decreases patient load.
- **Sterilizable anatomy:**
Sterilizable models allow surgeons to construct bone grafts, implant configurations, etc. in theatre before going in-vivo.



Step 1 – Patient Data Acquisition

The complete CT scan file (in DICOM - .dcm format) should be sent to the Ortho-design team or uploaded onto the website before development can commence.

Option A (preferred option)

1. Patient injury data: The CT scan of the patient anatomy received by Ortho-Design is imported into Ortho-Design's modeling software for post-processing.
2. Additional patient information: Details on the critical parts of the CT scan should be sent to Ortho-Design for consideration when preparing the model and 3D-printing orientation. This is used to design an anatomical model that provides the surgeon with a clear illustration of the injured anatomy.

Option B

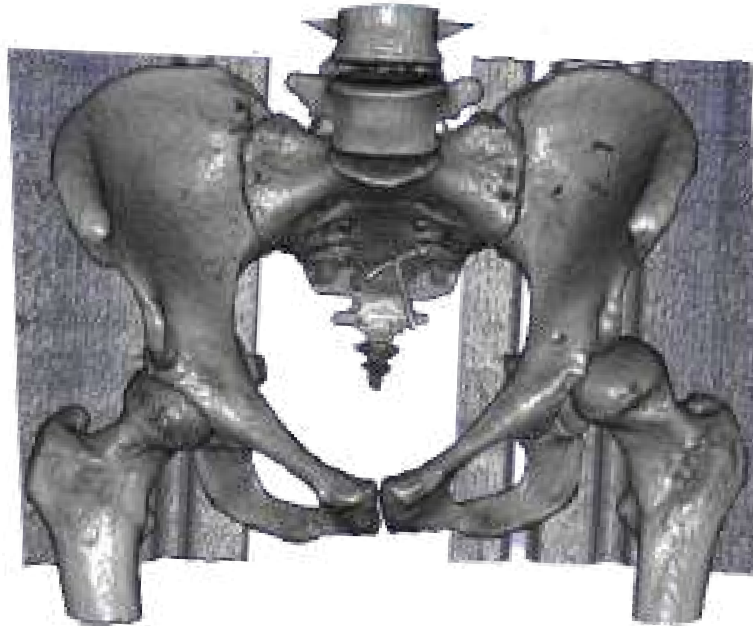
1. Patient injury data: The CT scan of the patient anatomy received by Ortho-Design is imported into Ortho-Design's modeling software for post-processing.
2. In-house model generation: Ortho-Design's team of specialized biomedical engineers will evaluate the scans and design a clear anatomical model. Although the team has extensive anatomical understanding, we prefer to receive details on the critical parts of the model from the surgeon involved.

Ortho-Design's interactive website makes the transfer of CT data effortless. The patient data is then used to create an anatomical model that provides the surgeon with extensive information to be used in pre-operative planning.

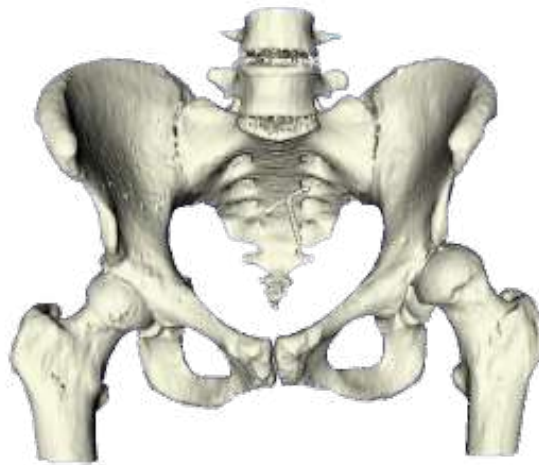
Step 2 – Anatomical Modelling from Patient Data

The CT scanned data is imported into Ortho-Design's modeling software to post-process and convert into usable data.

- The scanned data is uploaded to the software and transformed into a 3D model.



- The scan is manipulated into a model used for illustration.



- The 3D model is further processed to isolate critical anatomical features.



- The 3D model is then exported into readable CAD format for the preparation of the final anatomical model.

Step 3 – 3D Printing of Initial Model

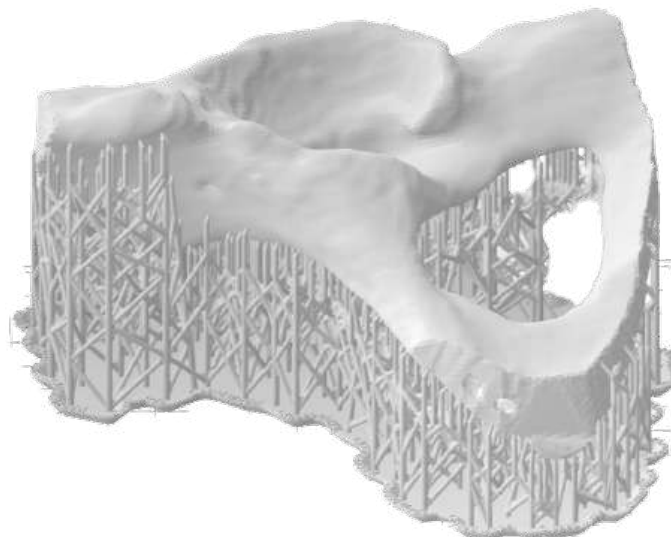
An anatomical model is 3D printed for evaluation and pre-operative planning.

At this stage, any adjustments or additions to the model can be requested.

- The process starts by refining the CAD model into a 3D printable format. All the remaining noise is removed, and the model is smoothed and optimized.



- The model is then exported into Ortho-Design's 3D printing software and the printing sequence is prepared. The final model is then cleaned and polished for surgeon review.

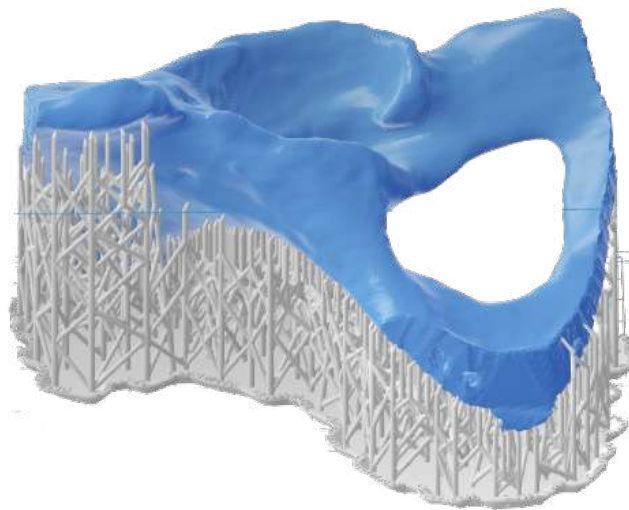


Step 4 – 3D Printing of Sterilizable Model

After surgeon confirmation, the final model is 3D printed.

This print is constructed out of a material that can be sterilized. This allows the surgeon to use the anatomical model for assistance during surgery.

- The final model is prepared and 3D printed using Ortho-Design's unique material. The model is then delivered to the surgeon for ultimate assistance during surgery.



Step 5 – Delivery

The model is delivered directly to the surgeon.



- The model can be printed out of a variety of materials. From an economic polypropylene to sterilizable high density acrylonitrile butadiene styrene and everything in between.



White Resin



Biomed Clear Resin
Can be sterilized



Clear Resin



Tough 1500 Resin
Can be sterilized



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