

3D Modelling For Preoperative Planning In Orthopaedic Surgery: Guide To Office Set Up

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INTRODUCTION:

3D modelling, or 3D printing technology has been gaining popularity across various fields, including orthopaedic surgery. A physical replica of computed tomography scan provides an extra dimension for understanding the precise patho-anatomy, thereby enhancing accurate preoperative planning and implant placement. With recent introduction of more cost effective 3D printing devices, it has become more accessible and can be easily set up in an orthopaedic office.

MATERIALS & METHODS:

To introduce various types of 3D printing technology available, including pros and cons. What are the consideration factors when choosing a suitable 3D printer for orthopaedic office set up, and estimated cost involved.

RESULTS:

Two types of 3D printing technology are shortlisted for orthopaedic office set up; Fused Deposition Material (FDM) and Stereolithography (SLA) devices. These two devices offer cost effective and relatively quick fabrication, and are suitable for 3D modelling in orthopaedic applications especially in an office set up. This presentation will also discuss the estimated cost of setting up and cost of printing each model for these devices, as well as post printing processes involved to obtain the final model. A brief introduction on how to create 3D model rendering from DICOM files will also be discussed in the presentation.



Figure 1: SLA printer and liquid photopolymer resin

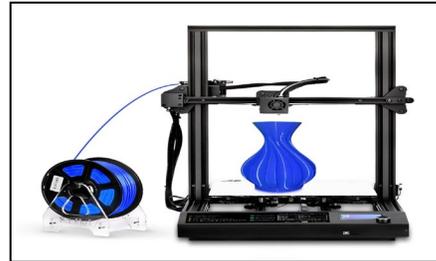


Figure 2: FDM printer and polymer filament

DISCUSSIONS:

3D printing technology has in recent years become simple and affordable to be adopted for use in preoperative planning in the field of orthopaedic surgery. 3D modelling is able to provide an extra dimension to better understanding the pathoanatomy and offer improved preoperative planning at very affordable cost. It is also simple enough to set up in office setting and 3D model is able to be fabricated in a relatively short amount of time.

CONCLUSION:

3D modelling should be adopted in orthopaedic and traumatology setting as it is easy to set up, affordable, relatively quick and most importantly is able to provide a better understanding and improved preoperative planning.

REFERENCES:

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