

**The Utilisation of Cranial Models  
 Created Utilising Rapid Prototyping Techniques in the  
 Development of Models for  
 Navigation Training**

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Keywords (in English):	Neurosurgical navigation , 3D rapid prototyping models, simulation
Abstract:	<p>Abstract</p> <p>Introduction          Navigation in neurosurgery has expanded rapidly however suitable models to train end-users to use the myriad of software and hardware that come with these systems are lacking. Utilising 3D industrial rapid prototyping processes we have been able to create models using actual CT data from patient's with pathology and have used these models to simulate a variety of commonly performed neurosurgical procedures with navigation systems.</p> <p>Aim          To assess the possibility of utilising models created from CT scan data set obtained from patients with cranial pathology to simulate common neurosurgical procedures using navigation systems</p> <p>Methodology          Three patients with pathology were selected (hydrocephalus, right frontal cortical lesion and a midline clival meningioma). CT scan data performed following image-guidance surgery protocol in DIACOM format and using Rapid Prototyping Machine to create the necessary printed model with the</p>

	<p>corresponding pathology embedded. The ability in registration, planning and navigation using two navigation using a variety of software and hardware provided by these platforms were assessed</p> <p>Results We were able to register all models accurately using both navigation systems and perform the necessary simulations as planned.</p> <p>Conclusion Models with pathology utilising 3D rapid prototyping techniques accurately reflect data of actual patients and can be used in the simulation of neurosurgical operations using navigation systems.</p> <p>Key-words Neurosurgical navigation, 3D rapid prototyping, models, simulation</p>
<p>Note: The following files were submitted by the author for peer review, but cannot be converted to PDF. You must view these files (e.g. movies) online.</p>	
<p>Video- Virtual Surgery.wmv</p>	

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