

Materials List for

Patient-Specific Polyvinyl Alcohol Phantom Fabrication with Ultrasound and X-Ray Contrast for Brain Tumor Surgery Planning

Eleanor C. Mackle^{*1,2}, Jonathan Shapey^{*1,2,3,4}, Efthymios Maneas^{1,2}, Shakeel R. Saeed^{3,5,6}, Robert Bradford³, Sebastien Ourselin⁴, Tom Vercauteren⁴, Adrien E. Desjardins^{1,2}

¹Wellcome / EPSRC Centre for Interventional and Surgical Sciences, University College London ²Department of Medical Physics and Biomedical Engineering, University College London ³Department of Neurosurgery, National Hospital for Neurology and Neurosurgery ⁴School of Biomedical Engineering & Imaging Sciences, King's College London ⁵The Ear Institute, University College London ⁶The Royal National Throat, Nose and Ear Hospital, London

* These authors contributed equally

Corresponding Author

Eleanor C. Mackle
eleanor.mackle.14@ucl.ac.uk

Citation

Mackle, E.C., Shapey, J., Maneas, E., Saeed, S.R., Bradford, R., Ourselin, S., Vercauteren, T., Desjardins, A.E. Patient-Specific Polyvinyl Alcohol Phantom Fabrication with Ultrasound and X-Ray Contrast for Brain Tumor Surgery Planning. *J. Vis. Exp.* (), e61344, doi:10.3791/61344 (2020).

Date Published

July 14, 2020

DOI

10.3791/61344

URL

jove.com/video/61344

Materials

Name	Company	Catalog Number	Comments
AutodeskFusion 360	Autodesk Inc., San Rafael, California, United States	https://www.autodesk.co.uk/products/fusion-360/overview	CAD software
Barium sulphate	Source Chemicals	-	
CT scanner	Medtronic Inc, Minneapolis, USA	-	O-arm 3D mobile X-ray imaging system
Glass microspheres	Boud Minerals		
Mechanical stirrer	IKA	4442002	Eurostar Digital 20, IKA
Meshmixer	Autodesk Inc., San Rafael, California, United States	http://www.meshmixer.com	3D modelling software. Version 3.5.484 used
Neuronavigation system	Medtronic Inc, Minneapolis, USA	-	S7 Stealth Station
PLA	Ultimaker (Ultimaker BV, Utrecht, Netherlands)	UM9016	
Potassium sorbate	Meridianstar	-	
PVA	Ultimaker	-	
PVA powder	Sigma-Aldrich	363146	99%+ hydrolysed, average molecular weight 85,000-140,000
Sonicator	Fisher Scientific	12893543	
Ultimaker Cura	Ultimaker BV, Utrecht, Netherlands	https://ultimaker.com/software/ultimaker-cura	3D printing software. Version 4.0.0 used
Ultimaker S5 Printer	Ultimaker BV, Utrecht, Netherlands	-	
Ultrasound scanner	BK Medical, Luton, UK	-	BK 5000 scanner
Water bath	IKA	20009381	HBR4 control, IKA

3D Slicer	http://slicer.org	-	Software used to segment patient data. Version 4.10.2 used
-----------	---	---	--