

complex concentrate compared with fresh frozen plasma in emergency warfarin reversal in the United Kingdom. *Clinical Therapeutics* 2010; **32**: 2478–93.

doi:10.1111/anae.12702

Three-dimensional interactive model of lumbar spinal structures

The application of three-dimensional software to pre-operative magnetic resonance imaging (MRI) data [1] enables 3D models to be reconstructed and embedded in Portable Document Format (PDF) files [2, 3].

We wish to bring readers' attention to a free resource for 3D MRI images that might be useful for interactive demonstration of lumbosacral structures, specifically relevant to neuraxial blockade: [\[deposit.ub.edu/dspace/handle/2445/44844?locale=en\]\(http://deposit.ub.edu/dspace/handle/2445/44844?locale=en\) \(English translation top right of screen\). At present, this program runs under Acrobat Reader XI on Windows or Mac computers, but not on tablets, smartphones or Linux systems. Files must be downloaded and saved in the same folder, for which the name must not contain spaces or special characters. Source code and model geometry are not public.](http://</p>
</div>
<div data-bbox=)

The model includes reconstructions of vertebrae, intervertebral disks, ligaments, epidural and foraminal fat, dural sac and sleeves, sensory and motor cauda equina roots, anaesthetic approaches (epidural medial, spinal paramedical and radicular paths), together with predefined sequential 3D views of anaesthetic approaches to epidural blockade, for educational purposes. Zoom, 360° rotation, selective views

and transparencies of each structure, and clipping functions, are available (Fig. 4).

A. Prats-Galino

M. Mavar

Faculty of Medicine, Universitat de Barcelona

Barcelona, Spain

Email: aprats@ub.edu

M. A. Reina

Madrid-Montepríncipe University Hospital

Madrid, Spain

A. Puigdel·livol-Sánchez

Universitat de Barcelona and Consorci Sanitari de Terrassa Rubí (Barcelona), Spain

J. San-Molina

University of Girona
Girona, Spain

J. A. De Andrés

General University Hospital
Valencia, Spain

The project was partially funded by Marató TV3 Grant Project 411/U/2011. Ethical committee approval was obtained for the use of anonymised DICOM-MRI data (Code CEIC-Grupo HM: 13.03.433-GHM). No competing interests declared.

References

1. BWH and 3D slicer contributors. 3D slicer, 2014. <https://www.slicer.org/pages/Introduction> (accessed 06/03/2014).
2. Phelps A, Naeger DM, Marcovici P. Embedding 3D radiology models in portable document format. *American Journal of Roentgenology* 2012; **199**: 1342–4.
3. Mavar-Haramija M, Prats-Galino A, Berenguer-Escuder CI, Juanes-Mendez JA, Puigdel·livol-Sánchez A. 3D PDF Technology combined with JavaScript function enables the creation and visualization of interactive 3D presentations. *ACM Digital Library*. <http://dl.acm.org/citation.cfm?id=2536548> (accessed 06/03/2014).

doi:10.1111/anae.12690

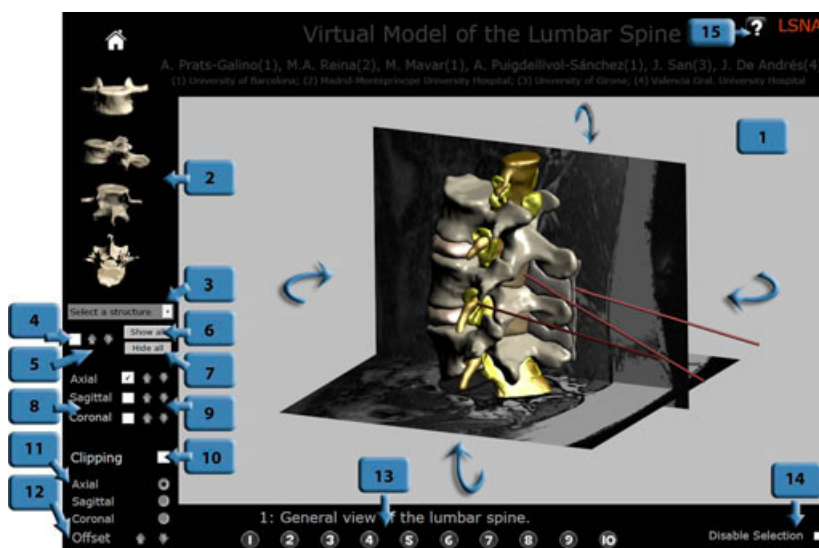


Figure 4 3D interface: 1) screen working area; 2) different aspects available; 3) list of structures, with 4) check box confirmation; 5) arrows to modify transparency; 6) command to combine or 7) hide structures; 8) selection of views with 9) navigation tools; 10) clipping tool in 11) three planes and 12) different cuts in each plane; 13) predefined educational views; 14) disabled automatic selection of clicked structures; 15) help file.