Clinical Anatomy 25:668–669 (2012)

BOOK REVIEW

The Human Brain in 1492 Pieces: Structure, Vasculature, and Tracts, *by Wieslaw L. Nowinski, Beng Choon Chua, Guoyu Qian, Yevgen Marchenko, Fiftarina Puspitasari, Natalia G. Nowinska, and Michael V. Knopp*, New York, NY Thieme, 2011, CD-ROM $349.99, ISBN-13: 978-1-6040-6551-0.

As a continuing student and instructor of neuroanatomy, I have been waiting for this software for a very long time. *The Human Brain in 1492 Pieces* is a beautifully rendered, easy to use tool for beginners and advanced students of human neuroanatomy. If you plan to use this atlas in the classroom, I highly recommend taking the time to read the Introduction. This section provides information concerning the design of the atlas as well as the imaging methods used. The atlas is based on imagery collected from a single specimen with 3 T and 7 T MR [MP-RAGE, two-dimensional (2D)/3D time of flight (TOF), susceptibility weighted imaging (SWI), spoiled gradient-echo (SPGR), diffusion tensor imaging (DTI)]. The imagery includes a color, 3D rendered surface of the brain including the underlying white matter, subcortical nuclei, blood vessels and fibers, and gray scale MR images. The inclusion of DTI is especially useful as there is no way to present this information in a typical 2D photographic atlas.

Following a warning that this atlas is not a guide for neurosurgery, you begin by hitting ''Start'' on the home page. The brain including the vasculature appears. I recommend hitting the ''Help'' key. The help page lists the features of the menus and how to use the right and left clicks on the mouse to rotate or pan through the imagery and is worth a few minutes of your time. Four menus run along the upper left of the screen and control gross features of the software. These menus may be used to toggle on and off large areas of the brain, for example, the entire cortex or cerebellum on the right or left or both sides. The same applies to the arteries, veins, and tracts. The menus along the right side of the screen add a higher degree of control and allow the user to visualize individual structures, for example, under the heading of Brain, it is possible to select subcortical and further select/deselect the amygdala. Depending on the degree of detail desired, it is often easier to use the menu in the upper left to deselect an entire system and use the right side menus to add back the structure of interest.

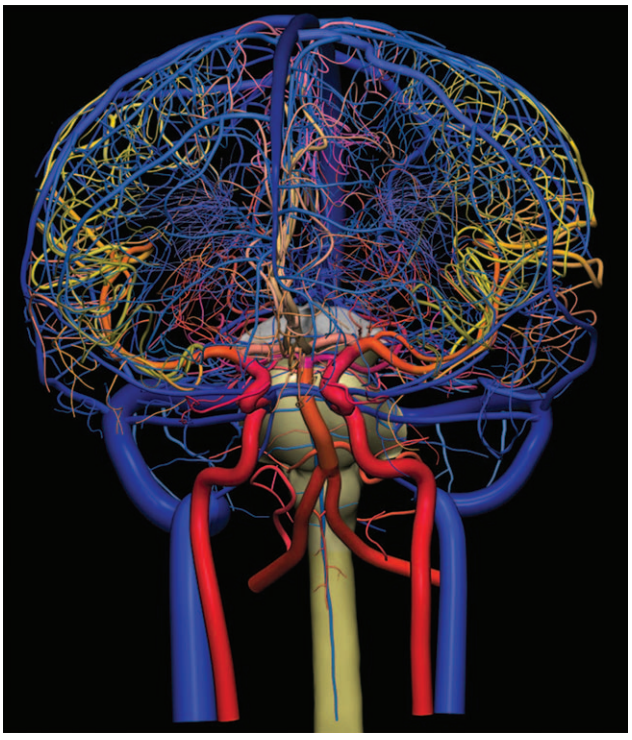

Fig. 1. A 3-dimensional rendering of arterial and venous structures. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

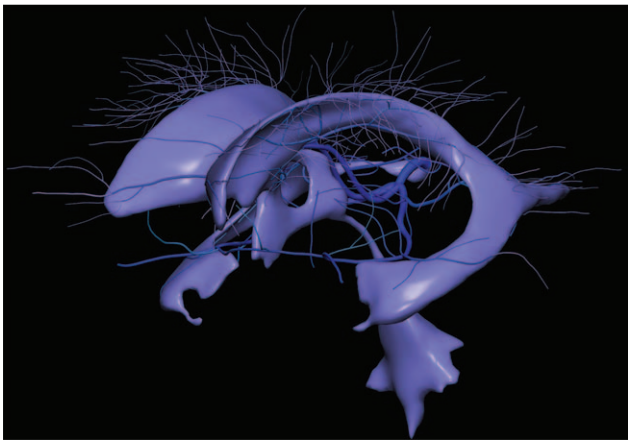

Fig. 2. The ventricular system. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Using this scheme, I was able to isolate several different structures in the subcortical and white matter regions but was unable to bring up individual areas of the cortex. Individual gyri may be highlighted but it is not possible for a gyrus to ''stand alone.'' By isolating structures listed in the subcortical and white matter menus, it is possible to then toggle on and off the veins, arteries, and tracts. The result is a rotatable, 3D image of the structure of interest and the vasculature and fiber tracts in its immediate vicinity. Following the tracts is made easiest by toggling off then adding back tracts of interest. As with the tracts, the den-

*Correspondence to: Kelli A. Sullivan, PhD, Division of Anatomical Sciences, Department of Medical Education, University of Michigan – School of Medicine, Ann Arbor, MI 48109-5608.
E-mail: ksulliva@umich.edu

Received 15 February 2012; Accepted 16 February 2012

Published online 10 May 2012 in Wiley Online Library (wileyonlinelibrary.com). DOI 10.1002/ca.22070

sity of blood vessels is a little overwhelming and seems more digestible by turning them all off and adding back. I found the ''In Groups'' settings particularly helpful regarding the vasculature. When viewing the whole brain and all of the vessels, selecting ''In Groups'' and clicking on a particular artery or vein resulted in flashing which not only highlighted the vessel but revealed its area of distribution. Again, the whole image may be rotated to provide the user with a nearly infinite number of views. The other important feature of this atlas is the ability to superimpose the rendered image over the MR imagery. The controls for axial, coronal, and sagittal are simple – check the box for the desired plane of section and slide the bar to section the brain. Being used to photographic atlases that use Wiegert-stained sections, I was initially disappointed with the clarity of the MR imaging. The distinction between gray and white matter is clear and the caudate, putamen, globus pallidus, thalamus, and other deep structures are distinct and easily visualized when their 3D counterparts are removed. One drawback with the MR imaging is the lack of labels when viewing this information.

Although this is an amazing atlas, there is room for improvement. One particular deficit is that while this atlas includes the claustrum, it does not include the septal nuclei, nucleus accumbens, or any of the other deep forebrain nuclei. It is also not possible to highlight a major artery or vein and all of its branches. The addition of systems, for example, basal nuclei or limbic system would be useful, especially for beginning students. The graduate and undergraduate students in my laboratory were, however, impressed with the level of detail and the flexibility of the imagery. Overall, this is an extremely useful tool for learning and teaching neuroanatomy.

Kelli A. Sullivan, PhD*
Division of Anatomical Sciences
Department of Medical Education
University of Michigan – School of Medicine
Ann Arbor, Michigan