SOFTWARE REVIEW

Interactive Knee. Version 1.1. Aichroth PM, Mahadevan V, Harris JM. Primal Pictures, Ltd., 159–163 Great Portland Street, London WIN 5FD, U.K.; 800.716.2475 (United States and Canada), +20.7637.1010 (United Kingdom), +44.20.7637.1010 (worldwide); www.primalpictures.com; 2000. ISBN 1-902470-42-7. Major system requirements: PC: Windows 95, 98, 2000, or NT 4.0; Pentium or equivalent processor; 32 MB RAM; 16-bit color display (thousands of colors), CD-ROM drive, 800 × 600 pixels or higher screen resolution, and 6 MB (approximate) available hard drive space. Macintosh: any Power Macintosh or equivalent; 20 MB free RAM; thousands of color display; System 7.1 or higher; Quicktime 2.5 with MPEG decompressor installed. Price: $250 (single-user license for individuals or institutions); $995 (single-user institutional license for complete five-part series). Contact Primal Pictures for multiuser network license and Web-based online subscription costs.

Interactive Knee 1.1 is one in a family of computer-based instructional products from the three-dimensional Interactive Anatomy Series published by Primal Pictures. The other titles in the series include Interactive Foot and Ankle, Interactive Hip, Interactive Hand, and Interactive Shoulder. Primal Pictures publishes two other related products (not part of the series), Interactive Knee: Surgery Edition and Sports Injuries: The Knee. This review concentrates on the IBM-compatible version of Interactive Knee 1.1. Anatomical and clinical content aside, each title in the series is virtually identical in terms of hardware and software requirements, user interface, features, program navigation, and price.

The producer promotes the product as a complete three-dimensional anatomical reproduction of the knee, including higher (femur) and lower (tibia and fibia) structures. Comprehensive anatomical, clinical, and radiological textual content accompany the reproductions. In addition to three-dimensional models, there are also illustrations, clinical X rays, biomechanical videos, clinical slides, and magnetic resonance images (MRIs) of various anatomical and clinical content.

The CD-ROM is an interactive tool for educating users about the complete anatomical structures and clinical manifestations of the knee. It is designated for use by teaching faculty for reinforcing lectures and problem-based curricula, by medical and physical therapy students undergoing clinical clerkships, or by patients being treated for injuries, diseases, or physical abnormalities of the knee. As a self-paced learning tool, the product offers immediate reinforcement to identify and test users' knowledge of the complete musculoskeletal, nervous, and arterial structure of the knee. The product, as reviewed, is intended for use as a stand-alone CD-ROM. A multiuser version for installation on a network file server is also available.

Installation is very straightforward and uncomplicated. Like most contemporary software installations, the setup portion runs automatically when the CD-ROM is first inserted. Alternatively, if users or system administrators have disabled the AutoPlay feature in Windows or have already installed the program, a standard installation program (setup.exe) can be invoked from the root directory on the CD-ROM.

Several different systems were utilized to evaluate the software installation. They ranged from a Pentium Classic with 128 MB RAM and a 2X CD-ROM drive to a Pentium III with 256 MB RAM and a 32X CD-ROM drive. The program was also installed on Windows 98, Millenium Edition (Me), 2000, and NT Workstation 4.0. While there was a noticeable difference in terms of installation and application start-up speed between the Pentium Classic and Pentium III systems, the software performed identically on both systems and installed flawlessly under all four versions of Windows. In addition to the stand-alone CD-ROM installation, the program is also available as a multiuser network version or as a Web-based online subscription.

The program comprises five main sections (anatomy, contents, MRI, quiz, and test) and a slidebox. Each of the five main content sections is accessible from corresponding folder-like tabs located immediately below the top menu bar. The slidebox is accessed from the top menu bar.

The anatomy section, the main component of the program, displays several views of the knee as a three-dimensional model with text displayed alongside and to the right. The model can be rotated horizontally on an invisible vertical axis continuously or incrementally ten degrees at a time. A layer control allows the addition and subtraction of eighteen layers of anatomy from deep (bone regions) to superficial (musculoskeletal, nervous, and arterial system). Every region of the anatomical model is labeled and extensively annotated with text. Users simply point to and select a particular structure of interest, and the name of the structure is then displayed along with a complete anatomical and clinical description. Hyperlinks to related illustrations, MRIs, X rays, and anatomical and clinical slides are often included in the clinical text.

The contents section provides a directory to the entire contents of the CD-ROM. Here users can browse by type of content, search by structure label or text title, or view hyperlinks to selected illustrations, MRIs, or slides. The MRI section presents three orthogonal

views (axial, sagittal, and coronal) of the knee's structure in slices. The quiz and test sections allow users to assess their understanding of the material. Given that users can choose the number of questions to answer and can select between two question types, two levels of difficulty, and four layers of structure, there are literally thousands of quiz-configuration permutations. The test section is presented as a multiple-choice exam consisting of an initial topic and five optional statements to which users respond from three choices: true, false, or pass.

The slidebox is an integrated presentation module for incorporating illustrations, slides, MRIs, and video clips into the classroom presentation. It comprises an editor for sorting, adding, and deleting images; viewer for identifying or associating labels of the structure or image; and slide show for presenting images in a full rather than windowed screen.

There are two other related products that are very similar in title and content yet quite different in presentation. The first, from the University of Pennsylvania, Interactive Images: Knee (www.rad.upenn.edu/rundle/InteractiveKnee.html), provides interactive identification of both axial and sagittal knee MRIs. The second, by the University of Washington Digital Anatomist Project, Interactive Atlas of the Knee, is available both as a CD-ROM for purchase and online at no charge via the Web (www9.biostr.washington.edu/da.html). Neither of these free products offers the three-dimensional representation, image manipulation, or rich content found in Primal Pictures' Interactive Knee.

This reviewer believes the learning curve to using the product is very low. The interface employs a standard menu bar, tabs for easy navigation between the program's five sections, and easily recognized icons (magnifying glass, hand, pointing finger) for rotating, magnifying, and moving three-dimensional models or linking to related text. The quiz section offers immediate auditory and visual feedback to individual questions. The test section allows users to keep track of their scores at anytime.

The single-user price of $250 might be a deterrent to some librarians, given the availability of various sources from the Visible Human Project. Fortunately, the producer offers both a demonstration CD-ROM and thirty-day money-back guarantee. When using the software at the minimum resolution of 800×600 pixels, some program buttons were not visible unless the Windows Taskbar was hidden. The online documentation was also somewhat limited.

Interactive Knee 1.1 is truly an outstanding educational product. The volume and clarity of the models, videos, X rays, slides, and illustrations are remarkable. The attention to detail in the anatomical and clinical write-ups is evident throughout the product. Despite its price, I highly recommend the product for use in libraries, learning resource centers, or patient education centers that support programs with a special emphasis on orthopedics, physical therapy, sports medicine, or rehabilitation.

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