Anatomy and Anaesthesia of the Mandibular Nerve (Version 1.0, 1992). A. Demirjian, Université de Montréal, Faculty of Dentistry, 2900 Édouard-Montpetit Blvd., P.O. Box 6128, Station A, Montreal, Quebec, Canada H3C 3J7. Or, Son-art Inc., P.O. Box 103, T.M.R., Montreal, Quebec, Canada H3P 3B8; MULTIMEDIA@MEDENT.UMONTREAL.CA (Internet); U.S. $199.95 (French or English languages); discounts for multiple and student orders. System requirements: IBM-compatible or Macintosh.

Computer-based interactive educational programs in dentistry and oral health are few, and good ones are scarce. The Anatomy and Anaesthesia of the Mandibular Nerve program falls within the latter category. Dr. Arto Demirjian and his colleagues from the faculty of dentistry, University of Montréal, are to be commended for the development of this program, which successfully incorporates sound, text, and graphics (drawings, digitized black-and-white and color photographs, x-rays) on the same screen, within the framework of an interactive teaching program. They also have developed a number of other dental, trilingual (English, French, and Spanish), computer-based interactive programs or "multimedia medico-dental courseware," as the authors label them, which utilize both CD-ROM and diskette technologies. Minimum hardware specifications for the IBM-compatible are a 386 central processing unit, a 13-inch VGA color monitor (640 by 480 pixels), 8-bit videocard (256 colors), mouse, 1.44-megabyte diskette drive, 3-megabyte free RAM, 13-megabyte hard disk space, sound card (optional), and Windows 3.x (with Multimedia Extension Kit, if version 3.0). Minimum specifications for the Macintosh are a 13-inch color monitor, 8-bit videocard (256 colors), 3-megabyte free RAM, 15-megabyte hard disk space, and System 6.0.7 or higher.

The IBM-based version of Anatomy and Anaesthesia of the Mandibular Nerve program was reviewed. It was loaded onto a 386 central processing unit hard disk using 7 high-density diskettes (A CD-ROM version of the program is now available for U.S. $249.95 in English, French, or Spanish.) Installation of the program was uneventful (the sound component of the program was not activated for this review). Accompanying documentation was minimal and of informational value only. Those users familiar with Macintosh or Windows programs should have no difficulty in using the program.

This branching computer-based interactive program comprises four teaching modules or chapters: Osteology, Dissection, Clinic, and Quiz. It is designed to help dental students and dental practitioners correctly identify the mandibular nerve and the surrounding bone structure, nerves, blood vessels, and muscles. The program also instructs the user in the correct technique for anesthesia of the mandibular nerve. And finally, it provides a self-assessment module, Quiz, which is designed to test the user on knowledge acquired in the Dissection chapter of the program.

Five "assist" buttons are available and they include "menu" (displays opening menu), "back" (returns the user to the preceding section), "help" (single help screen), "quit," and "Where am I?" (a navigation device). The "Where am I?" button, perhaps the most useful of these buttons, serves as a location or navigation tool. When activated, a clear, linear diagram of the current module is displayed, locating the user's position in that specific chapter or module. It also allows the user to click ahead or back in the current module or to click to any other of the three remaining modules without resorting to continuous clicking of the "back" button or clicking the "menu" button to return to the beginning of the program. There are also "zoom" (provides a close-up) and "x-ray" (displays an x-ray) buttons scattered throughout the program. The "help" portion of the program, on the other hand, is quite limited and does not provide in-depth assistance in navigating the user through the program.

The four teaching modules utilize explanatory text, anatomical drawings and photographs, diagrams, and x-rays, which can be simultaneously displayed on the same screen. The Osteology module presents an anatomy program of the mandibular ramus (internal, external, anterior, and posterior), the skull (internal and external cranial base), and techniques for correct intra-oral anesthesia. The Dissection module presents various dissection images and anatomical structures of the trigeminal ganglion (anterior and posterior divisions of the mandibular nerve). The Clinic chapter, like the previous two modules, uses photographs, drawings, and x-rays to present anatomical references identifying key facial and cranial bone "reference points" for correct syringe position and successful anesthesia of the dental patient. The model also presents causes for anesthesia failure and complications. The Quiz module tests the user on
knowledge gained in the Dissection chapter. In this chapter, the user is asked to identify highlighted structures from an image by clicking on the correct answer from a list. The user has two chances to answer a question: via user-selected questions or random program-selected questions, before the correct answer is displayed in highlighted text. Sixty-eight questions are presented, points are accumulated, and the results are compiled by the program for each use only.

Overall screen presentations are straightforward and are of good-to-excellent quality, particularly the photographs and dissection portions, which are critical to the overall success of the program. The text is clear, simple, and direct, with points of interest, such as key anatomical structures, highlighted in different-colored text. When any colored text is clicked on, it activates the corresponding image (either by colored broken lines, arrows, or contrasting color), also highlighted, on the relevant drawing, x-ray, or photograph. The correct video card and driver must be installed (e.g., Paradise 800 by 600, 256 colors) to make use of the full potential of the graphics portion of the program. (The program was also used with the incorrect setting for the video card. The program itself ran fine but the quality of the graphics, especially the color photographs, were monochrome in color and it was extremely difficult to see highlighted structures in the Dissection and Quiz portions of the program.)

Faculty criticisms of the program focused on content. Concern was expressed about a photograph in the Clinic module that showed an ungloved dentist anesthetizing a patient. There was concern that the rate of injection of anesthesia as stated in the program may have been too fast ("inject solution slowly [1 minute]"). Faculty claim that a full 1.8-milliliter cartridge should require approximately two minutes to inject [1], though this too is subject to debate. There was criticism of poor terminology selection; e.g., using the term the dental nerve for the inferior alveolar nerve. Other faculty criticisms: some of the graphics in the clinical sections, though excellent in execution, were not always relevant; some basic information was not covered; in the Clinic module, the "wrong techniques" section was considered too exaggerated; and, also in the Clinic chapter, the "complications" section implied that cases of trismus should be referred to an oral surgeon, and this was considered "overkill" unless other measures fail. Some of the obvious criticisms can be easily remedied through better editing and by the replacement of the offending photograph with one of a properly gloved dentist.

Our faculty found the anatomy portions of the program good to very good. As a tutorial or review tool they would be excellent. Criticisms centered on clarity of the photographs, because some were judged too dim. The nerves were well dissected, though there was criticism that the dots or broken lines outlining the nerves were unclear or faint, making it difficult to locate or identify the specific nerve in some of the dissection photographs.

British book reviewers are fond of identifying a U.S. or American bias in textbooks from the United States. No Canadian bias, however, could be found by this reviewer in the program, other than the variation spelling for anaesthesia. Although good current textbooks in anatomy and local anesthesia would provide practically the same information (in a more extended format) and comparable photographs and drawings, the book format would lack the interactivity provided by this fine program. This program could serve as a good supplement to written material and lectures for students. And it would be a useful review program for the general practitioner. The Quiz part of the program would be particularly helpful for students, both dental and auxiliary, in reviewing for head-anatomy courses and exams. I would recommend this software program, even with the criticisms received from our faculty. According to the distributor, demonstration packages are available via the Internet and anonymous file-transfer protocol at AMALGAMEDENT.UMONTREAL.CA in the "pub/" directory.

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