

UpToDate: A comprehensive clinical database

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How many clinical questions arise during an average day at the office? How many more questions might one entertain if clear-cut, expert advice were seconds away? Enter UpToDate, an electronic clinical database for, well, acquiring up-to-date clinical information—plus continuing medical education (CME) credits and patient handouts.

Unlike a textbook, UpToDate is not set up for paging through content from beginning to end. Rather, it is designed for searches that yield lists of relevant monographs. UpToDate's initial screen displays simple menu bars and a prominent search box (Figure 1). The next step allows one to narrow the search (Figure 2).

Per its educational objectives, UpToDate provides "instant access to the most current clinical information and recommendations on patient care and treatment," yet is "comprehensive" from "physiological concepts through results of the most recent clinical trials and protocols." Each monograph indicates when the literature was last reviewed and the document updated. The service is available in 3 formats: personal computer-based, online, and Pocket PC. We reviewed these formats using Windows PCs.

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■ TESTING UPtODATE IN A CLINICAL CONTEXT

Following are a few questions that needed answering during a half-day of practice:

- How effective is topical terbinafine (Lamisil) in treating *Candida* skin infections?
- What is a reasonable algorithm to determine the cause of chronic renal failure?
- How does one compound nitroglycerin ointment to treat an anal fissure?
- What is the latest thinking on interstitial cystitis?
- What is the preferred empiric antibiotic therapy for presumed bacterial conjunctivitis in adults?
- Does efficacy differ between injectable and intranasal forms of calcitonin for relief of pain from osteoporotic vertebral compression fractures in postmenopausal women?

UpToDate answered 4 of the 6 questions quickly, requiring no more than a few minutes for each search. We found that 2% nitroglycerin must be diluted to 0.2% for use on anal fissures. We also obtained summarized information on interstitial cystitis, a treatment recommendation for conjunctivitis, and data regarding the efficacy of calcitonin administered by either of 2 routes. The information generally was excellent.

More difficult searches

Testing UpToDate further, we searched for less common maladies. We found 4 sentences on proctalgia fugax that, remarkably, seemed to cover the topic adequately. Transient global amnesia was covered tersely (3 sentences) but, again, adequately. Restless legs syndrome was covered well, in several paragraphs, although drug therapies were discussed in random order rather than by drug of choice. Piriformis syndrome was covered inadequately, and presbyesophagus was not listed at all.

Controversial topics

Subsequent searches yielded excellent discussions on controversial topics. Many monographs lend themselves best to leisurely reading, but they could also be used at the point of care. For example, the controversial diastolic “J-curve phenomenon” in treating hypertension is covered in about fourteen 2- to 6-sentence paragraphs. A summary appears first, typical of UpToDate’s style (Figure 3).

This section on diastolic blood pressure is subdivided into “Positive studies,” “Negative studies,” and the “HOT trial.” Users may jump directly to the “HOT trial” summary by clicking on that title on the left window. References appear in a text box at the bottom of the screen. The relative sizes of these 3 windows may be changed by grabbing and dragging the lines dividing them.

Drug mentions

Drugs mentioned in UpToDate are hot-linked to the corresponding Lexi-Comp drug information monograph, which is “intended to serve as a rapidly accessible, concise initial [drug] reference resource.” UpToDate/Lexi-Comp does not provide guidance regarding cost of drug therapies.

FIGURE 1 UpToDate's main screen



Main search screen after entry of search term “pulmonary hypertension” and performing the initial search.

FIGURE 2 Typical UpToDate search screen



List of monographs retrieved after clicking “Pulmonary hypertension” from the list in Figure 1. Note that “Find in Text” is not active, but an option to “Narrow search results” results in a secondary search screen. Users selecting this option may then either enter a term in the secondary search box or choose among a list of “modifiers” that vary by topic.

■ NOTABLE FEATURES

Graphics

When the user clicks on a graphic’s link in the text, a figure, table, or picture is superimposed

FIGURE 3 Typical UpToDate monograph

Users can minimize the left-hand and bottom panes to have a larger main text pane. Although not marked like typical hyperlinks, clicking any reference in the text window pops up that reference and, if available, its abstract. Clicking any subheading in the left-side outline pane transports the user to that section (eg, “HOT trial”). Clicking “Recent Topics” on the upper menu bar produces a list of the last 20 sections visited. Revisiting a topic is then possible with one additional click.

on the text. The image disappears when the user returns to the text.

Patient education handouts

UpToDate offers patient education handouts; however, these could be made much more accessible. Veteran users know exactly where to look for these handouts, but novices may apply the “3 clicks and you’re out” rule when the process proves too frustrating.

Both “Prostate Cancer Screening” (including PSA testing) and “Screening for Breast Cancer” (including mammography) are about 5 single-spaced pages long when printed using Times New Roman 12-point. Although controversies are covered well, our guesstimate of the reading comprehension level is 1 or 2 years post–high school—maybe too difficult for patient education.

Search engine

UpToDate’s search engine is rudimentary. Multiword medical term searches are supported

(eg, “chronic renal failure” and “vertebral compression fracture”), as are initial word fragments (eg, “spondyl”). However, searches incorporating Boolean operators (AND, OR, NOT) and unrelated words are not directly supported, although an obtuse “secondary search” does provide for one AND operation. On this secondary search screen, users may choose to focus on a specific category of information, such as diagnosis, treatment, pathogenesis, or patient information.

The search function can be quirky. Although the words “gluteus medius bursitis” appear in the text, cutting and pasting those words into the search function yields no retrievals; this makes it more difficult to locate information. Searching “restless legs syndrome” produces the suggestion that the user search “restless legs”—which, when searched, produces a most relevant topic: “restless legs syndrome.”

■ ADDITIONAL DIGITAL TOOLS

Other features of UpToDate take excellent advantage of the electronic environment.

Hyperlinking. Extensive hyperlinking within and between monographs facilitates access to information.

Retracing steps. “Back” and “forward” buttons allow users to navigate linearly.

Text-string searches. The “Find in Text” feature, or its keyboard shortcut, Ctrl-F, allows users to find text string matches within the current monograph.

Search history. A “Recent Topics” button in the menu bar makes it possible to revisit the prior 20 topics viewed by a user.

Accessing citations. Clicking on any reference links users to that article’s citation and, if available, MEDLINE abstract. Citations may be exported to a text file, but may not be directly cut-and-pasted.

Exporting monographs. Users may print a

monograph, export a monograph as text or in rich text format (*.rtf), export a monograph's abstracts into WordPad, or (from the Web version) e-mail a monograph to a colleague with an optional, complimentary 7-day guest pass to UpToDate Online. Graphics can be exported into Windows Paint.

CME tracking. UpToDate keeps track of a user's "CME time," crediting up to 10 minutes (in hundredths of an hour increments) per topic per use of UpToDate. CME from the CD is unlimited; up to 50 hours may be accumulated online. Credits may be totalled for submission for a fee of \$25 per transmittal.

■ ROOM FOR IMPROVEMENT

Some of UpToDate's advice is open to question. Although information is generally well-referenced, a few statements should have been referenced but were not.

For example (in reference to bacterial conjunctivitis): "Aminoglycoside drops and ointments (Genoptic[®], Tobrex[®]) are poor choices since they are toxic to the corneal epithelium and can cause a reactive keratoconjunctivitis after several days of use."

UpToDate prominently advises that the Pediatric module is a work in progress. In searching for "delayed menarche," the closest match we found was "Pubertal changes (Tanner stages)." Information was sufficient to answer most clinical questions. However, UpToDate did not provide a clinically useful graphic listing sentinel events (Tanner stages, peak height velocity, menarche) in typical chronological order with anticipated normal age ranges.

Digital design problems

UpToDate fails to take full advantage of the electronic environment. Inexplicably, in the Contents menu screens, Find in Text is not active, and users cannot navigate using the Page-Up/Page-Down or (Ctrl+)Home/End buttons on their keypads. For example, following Contents through "Patient Education" to

With UpToDate, up to 50 hours of CME credit may be accumulated online

"Women's Health Issues," users find 48 topics in 19 sections as they try to locate the one of interest.

"Mammography" is integrated into "Screening for breast cancer," and is not a separate keyword for users who are visually scanning for that word (the only option).

Right-clicking is not supported.

An *Edit* menu is absent. Windows' *Cut and Paste* keyboard conventions (Ctrl-c/Ctrl-v) are supported in the main UpToDate window—but not in other windows.

Bookmarking—the electronic equivalent of the folded page corner—is unavailable, as is a *favorites* list.

Highlighting—electronic yellow, blue, and pink markers—is not supported.

No facility for user-added annotation is available.

Opening multiple windows of information simultaneously is not possible.

Standard resizing of the main UpToDate window (by "grabbing" edges of the window) is not supported.

Finally, an ability to limit searches from the main screen to patient handouts or Lexi-Comp would be desirable.

■ POCKET VERSION

UpToDate also provides a Pocket PC version. The Pocket PC version searches the same database with a search engine similar to the other versions. It lacks the search history offered in the CD version. Although faster than searching through a textbook, an average UpToDate search on Dell Axim X5 400 mHz (Intel PXA250) with 64 MB RAM and a SanDisk 1G CompactFlash card took about 10 to 27 seconds, plus more time to navigate through the long and sometimes cumbersome submenus.

The primary intent for palmtop medical soft-

An average search on the Pocket PC version took 10–27 seconds—impractical for point-of-care use

ware is point-of-care use. The extensiveness of UpToDate's text—occupying 800 MB of the 1G card—and limited speed of palmtop computers often makes this impractical. However, it should be emphasized that this rich, inclusive database is a valuable reference when time is not at a premium. Certainly, the Pocket PC version provides ultimate portability. Users contemplating use of UpToDate/Pocket PC should budget for a high-end Pocket PC and a 1G card.

CONCLUSIONS

UpToDate is a clinically useful, searchable database of medical information updated every 4 months and available on CD, online, and for souped-up Pocket PC palmtop devices. It is almost as if UpToDate purposely incorporated an unsophisticated search engine and did not optimize the electronic environment to flaunt its forte—the clinical database.

For family physicians, the database is of sufficiently high quality, and it will be even more useful as the pediatric module expands. We hope that future enhancements to UpToDate will include clinical bullets for point-of-care use and optimization of the electronic environment. The latter should include implementation of Boolean searches; bookmarks; highlighters; a user-added note facility; copying and pasting of references; links to drug cost information; and—the whole point of Windows! —multi-window capability and conventional window resizing.

Patient information needs to be more accessible to be clinically useful. Also, versions of the patient information handouts with less complex language to appeal to the average patient would be helpful. As is, UpToDate's importance will only increase. Highly recommended.

Product Information

CONTACT INFORMATION

UpToDate, 34 Washington Street, Wellesley, MA 02481.
Phone: 800-998-6374 (US and Canada) or 781-237-4788;
Fax: 781-239-0391.

Free customer support line, Monday–Friday, 8:00 AM–6:30 PM (EST). Subscription or order information: customerservice@uptodate.com. General inquiries: info@uptodate.com. Technical support: support@uptodate.com. Web site: www.uptodate.com.

PRICING

New annual subscription: \$495; renewal: \$395; trainees: \$195; group and institutional pricing: contact enterprise@uptodate.com.

Shipping to US and Canada: \$15/year; elsewhere: \$35/year. 60-day trial period during which purchaser may return all materials for a full refund.

Virtual tour available at www.uptodate.com. American Academy of Family Physicians members: free 14-day trial via www.aafp.org. Upon expiration (4 months), message alerts user that content is out of date. CDs cease to function 1 year from issue date.

SPECIFICATIONS

Initial: Windows or Macintosh and Pocket PC CD-ROMs, online user name and password. Two updates shipped at 4-month intervals (12-month subscription). Installation and activation directions, search tips, CD-based (or online) tutorial.

MINIMUM REQUIREMENTS

Computer requirements: CD-ROM drive (8X recommended), 16 MB RAM, 15 MB free hard disk space. *Windows PC*: 486/66 or Pentium processor running Microsoft Windows 95 or later. *Macintosh*: Power PC or G3/G4 processor running OS 8.1 or later. *Online*: Standard Web browser with cookies enabled. Recommended connection speed of at least 56K. *Pocket PC requirements*: Windows PC with CD-ROM drive. Pocket PC device running Windows Pocket PC 2000 or 2002 with Type II CompactFlash slot, expanded storage card/drive (1 GB; uses 800 MB), Pocket PC cradle, and media reader (connects storage device directly to the PC). Additional details: www.uptodate.com