

# The race of the millennium: CD-ROM versus the textbook

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## Abstract

**Objective:** To determine whether CD-ROMs are as fast as everyone thinks they are.

**Methods:** A grand contest between 2 textbooks and their electronic versions, held with the help of 10 victims.

**Results and interpretation:** We can't be expected to tell you that now. You'll have to read the paper.

What we are about to contemplate today is our rather scandalous love affair with the computer. It has developed much more quickly than we realized, and although we do not like to admit to it, we have become irrevocably dependent on them. Can you imagine life without email? Ah yes, I see you shudder at the mere thought. However, we will not be so cruel as to torment you with those images. Let us turn instead to the matter at hand — the CD-ROM. These perfectly round, elegantly shiny discs have captured our attention since they first appeared on the market. Although there were problems at first with a few misguided souls who insisted on using their CD-ROM drives as coffee cup holders, the confusion was soon cleared up.

Our obsession with computers has been brought to new heights with manufacturers trying to outdo each other by inventing new uses for these CD-ROMs, with their amazing data-storage capabilities. Only last week I received an unsolicited email inviting me to save money by replacing the contents of my library with their CD-ROMs. Just imagine the complete text of *Pride and Prejudice*, *Great Expectations* and *Frankenstein* at the click of a mouse. Think of the shelf space I would liberate. I must say that I am looking forward to relaxing in my favourite armchair with my computer monitor in my lap and my mouse beside me. (I just have to figure out how to get those annoying cables out of the way.)

But I am off the topic. You should not permit me to digress like this.

In 1997 a study conducted in the United States revealed that approximately 14% of physicians accessed medical references on CD-ROMs.<sup>1</sup> Certainly, with the increasing speed and power of computers, that number has increased in the past 2 years. CD-ROM texts are easy to carry and are quite chic; however, they are also more expensive than their hard copy cousins (see Table 1). The figures presented in Table 1

do not include the cost of a computer of course, but since I am sure no one would even consider buying a CD-ROM unless they owned a computer, we will ignore that cost.

Our question, therefore, is: Are CD-ROMs worth the extra money? One would presume that because the CD-ROM costs more than the old fashioned print version, it should provide us with faster access to information. Portability and sophistication are important, but speed is the ultimate determinant for most people.

Enough with the introductions — on with the race!

## Methods

The victims (or subjects, if you prefer) who participated in this study were family physicians and family practice residents who were familiar with the use of computers and routinely consulted *Harrison's Principles of Internal Medicine* (13th ed) or *The Merck Manual* (16th ed). Each victim answered 20 questions; 10 questions were to be answered using the *The Merck Manual* and 10 using *Harrison's*. By the end of the study each question had been answered an equal number of times using the printed text or the electronic text. To maintain consistency the same computer (IBM Pentium II laptop) was used for all the electronic queries. If individuals had not previously used the CD-ROM versions of the texts, they were given instructions and adequate time to familiarize themselves with the programs. Each participant was given 2 practice questions to "warm up" before beginning the race, and completed a survey after crossing the finish line. The survey assessed their computer usage.

## Results

We found 10 people, ranging in age from 29 to 67 years, who were willing to partake in our competition. Three of the 10 reported using the Internet once a month, 2 once a week, and 5 reported using it daily. Internet use was our approximate gauge of the subjects' familiarity with computers and search engines.

The results for our contest provide no evidence that the CD-ROM provides faster access to information than the printed text. In fact, those using the printed versions were faster using both references (a little faster for the *Merck*, but a lot faster for *Harrison's*) (Table 2). You may draw your own conclusions.

## Interpretation

Now, ladies and gentlemen, you have heard the aston-

ishing results of our extraordinary race. Has our faith in computers been misplaced? How can it be that the magnificent CD-ROM has been outdone by the lowly textbook? Let us break the problem down into its component parts. There are 4 main factors that make searching a printed text different from searching a CD-ROM.

• **The search method: index versus search engine**

Theoretically, one uses the index and the search engine for the same purpose: to help guide you to text that relates to your topic of interest. However, it is our experience that the index of a textbook is more concise and easier to use than an electronic search engine. The “results” list produced by search engines often contains long phrases and chapter headings, but index entries are generally kept to a minimum of several words. Moreover, some people attest that the act of flipping through a book and reading various headings stimulates the memory and may actually help in the search.

• **Speed of computer versus speed of flipping pages**

The average computer-literate individual will probably find a specific answer to a specific question (e.g., definition) faster when using a computer than flipping through a book. However, the process may not be faster using a computer when the question asked is more ambiguous.

• **Speed of scanning computer text versus speed of scanning printed text**

It should be considered that we read the text on a computer screen differently from that in a book; scrolling down long pages of typed text with your mouse on the scroll bar is quite different from reading columns of text on a printed page. (And your computer desk may not be as comfortable

as your favourite armchair.) Most Web page designers are familiar with guidelines that advise keeping text to a minimum and using many headers and ample white space. Perhaps, to be more effective, the CD-ROM versions of textbooks should be reformatted and reorganized to make scanning the computer screen an easier task.

• **Familiarity**

Most people have been reading books all of their lives (and are quite familiar with how to use them) but have only recently begun to use computers. Each program has its own idiosyncrasies, and each search engine has subtle differences. For example, *Harrison's* allows the user to adjust the level of precision desired in a search. When a user gets to know a program and discovers the “tricks” to use, the time it takes to complete a successful search likely decreases.

We will be the first to admit that our study, although brilliant, is not perfect. To be applicable in a clinical setting, our questions should have been selected using a more systematic method — perhaps by randomly selecting from a pool of questions various clinicians looked up in the span of a week. Furthermore, we need more victims. The results from 10 people are not enough to break our infatuation with CD-ROMs. Therefore, we encourage you all to go out into the world and conduct your own experiment. Try it on your relatives when you are stuck at a tedious family gathering. We are certain it will add holiday spice and cheer to your party.

## Conclusion

The old-fashioned printed text is cheaper, has nostalgic appeal (for the good old days) and seems to be at least as fast as the electronic version. However, the CD-ROM is more portable (unless you also plan to carry your desktop computer with you) and is definitely more compatible with our image of being technologically advanced.

To CD-ROM or not to CD-ROM; that is the question... Enough already! Now, where is that holiday cheer?

## Reference

1. Ebell MH, Gaspar DL, Khurana S. Family physicians' preference for computerized decision-support hardware and software. *J Fam Pract* 1997;45:137-41.

**Please note:** The authors would like to mention that they will be happy to re-examine this question if provided with sufficient inducement. We are not particular in our requirements and will accept cash, cheques and all major credit cards. We anticipate that various CD-ROM manufacturing companies may be interested in our offer and would like to mention in advance that, although we do not accept free CDs, we will negotiate. Happy holidays!

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**Table 1: Approximate costs of resources**

Resource	Cost, \$*	
	CD-ROM	Textbook
<i>Harrison's Principles of Internal Medicine</i>	280	184
<i>The Merck Manual</i>	154	56

\*Canadian dollars.

**Table 2: Mean time taken to find answers using the electronic and printed versions of 2 common resources**

Resource	Mean time, s		
	CD-ROM	Textbook	Difference
<i>Harrison's Principles of Internal Medicine</i>	648	468	180
<i>The Merck Manual</i>	351	317	34
Total	999	785	214