

New Media



[1] *Web Page Evaluation in Medical Education*

(Medical Education Web Page Series – Part 8)

The proliferation of medical Web pages on the Internet has led to a need for an evaluation of the great many offerings available in order to spare individuals from wasting time on worthless medical sites, or worse, from being exposed to frank misinformation. For example, users of medical Web sites may unknowingly be exposed to biased information from commercial interests presented in the guise of a medical education Web site. While some of these sites may be easy for the sophisticated user to detect, others, well-formatted and professionally designed, may be openly deceptive. (Many readers will find a visit to www.quackwatch.com to be highly informative in this regard).

Fortunately, several informal and formal evaluation strategies exist to evaluate medical Web pages and ensure that users are exposed to high quality medical Web pages in their electronic travels. One simple method is to trust only well-established sources such as the Canadian Cancer Society or the Canadian Anesthesiologists' Society, but this approach may miss many important sources. Ultimately, what is needed is for well-qualified individuals to systematically review a number of Web pages according to a set of criteria and make these reviews publicly available.

While this critical appraisal approach is important, relatively few Web pages have been evaluated in this manner. Regardless, such an appraisal might be based on a checklist such as that provided in Table I. A somewhat more structured approach to Web site evaluation is provided in Table II, based on the five issues of accuracy, authority, objectivity, currency and coverage.

In addition, authors of Web pages sometimes encourage feedback from readers so they can be informed of typographical errors or receive suggestions or feedback. Still other sites have been subjected to formal peer-review to ensure the highest quality product, although this is rare other than in the case of Web sites associated with academic journals.

TABLE I A Possible Checklist of Questions for Evaluating Medical Education Web Sites

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- What is the purpose or mission of the page?
 - Who is the author and what are the author's qualifications?
 - Has the intended audience been identified?
 - Is the information clearly written and appropriate for the intended audience?
 - Is the information current, comprehensive, and accurate?
 - Is the information presented in an objective and balanced manner and are the sources for the provided information clearly listed so they can be verified?
 - Is the site an integral resource in and of itself, or has it merely been abstracted or summarized from another source?
 - Is there appropriate use of illustrations and graphics?
 - Is the site intuitive and easy to navigate?
 - Does the author provide an e-mail address or other contact information such as a telephone number? (This is often at the bottom of the page, or via a link called "Contact us").
 - Who sponsors the site? Could the sponsors have a vested interest in the viewpoint presented?
 - Does the site tell you when it was last updated?
 - Are all the hyperlinks alive and well?
 - Does the site require additional software such as a Flash plugin?
 - Is there a version of the site that is "printer friendly" for users who prefer reading from paper?
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The Web has been in existence for just under a decade. Perhaps the next decade will see a switch from a growth in volume to a growth in quality. However, for this to occur qualified individuals are needed to carry out reviews. Only time will tell whether this will eventually occur.

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CD-ROM Review: ACLS HeartCode

Laerdal's HeartCode™ is a CD-ROM-based interactive learning system for obtaining Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS) certification. I reviewed version 3.0 of the product,

TABLE II Five criteria for evaluating Web pages

Evaluation of Web documents	How to interpret the basics
<p><i>1. Accuracy of Web Documents</i></p> <ul style="list-style-type: none"> - Who wrote the page and can you contact him or her? - What is the purpose of the document and why was it produced? - Is this person qualified to write this document? 	<p><i>Accuracy</i></p> <ul style="list-style-type: none"> - Make sure author provides e-mail or a contact address/phone number. - Know the distinction between author and Webmaster.
<p><i>2. Authority of Web Documents</i></p> <ul style="list-style-type: none"> - Who published the document and is it separate from the "Webmaster?" - Check the domain of the document, what institution publishes this document? - Does the publisher list his or her qualifications? 	<p><i>Authority</i></p> <ul style="list-style-type: none"> - What credentials are listed for the author(s)? - Where is the document published? Check URL domain.
<p><i>3. Objectivity of Web Documents</i></p> <ul style="list-style-type: none"> - What goals/objectives does this page meet? - How detailed is the information? - What opinions (if any) are expressed by the author? 	<p><i>Objectivity</i></p> <ul style="list-style-type: none"> - Determine if page is a mask for advertizing; if so information might be biased. - View any Web page as you would an infomercial on television. Ask yourself - why was this written and for whom?
<p><i>4. Currency of Web Documents</i></p> <ul style="list-style-type: none"> - When was it produced? - When was it updated? - How up-to-date are the links (if any)? 	<p><i>Currency</i></p> <ul style="list-style-type: none"> - How many dead links are on the page? - Are the links current or updated regularly? - Is the information on the page outdated?
<p><i>5. Coverage of the Web Documents</i></p> <ul style="list-style-type: none"> - Are the links (if any) evaluated and do they complement the documents theme? - Is it all images or a balance of text and images? - Is the information presented cited correctly? 	<p><i>Coverage</i></p> <ul style="list-style-type: none"> - If page requires special software to view the information, how much are you missing if you don't have the software? - Is it free, or is there a fee, to obtain the information? - Is there an option for text only, or frames, or a suggested browser for better viewing?
<p><i>Putting it all together</i></p>	
<p><i>Accuracy.</i> If your page lists the author and institution that published the page and provides a way of contacting him/her, and . . .</p>	
<p><i>Authority.</i> If your page lists the author credentials and its domain is preferred (.edu, .gov, .org, or .net), and . . .</p>	
<p><i>Objectivity.</i> If your page provides accurate information with limited advertizing and it is objective in presenting the information, and . . .</p>	
<p><i>Currency.</i> If your page is current and updated regularly (as stated on the page) and the links (if any) are also up-to-date, and . . .</p>	
<p><i>Coverage.</i> If you can view the information properly—not limited to frames, browser technology, or software requirements, then . . .</p>	
<p><i>You may have a higher quality Web page that could be of value to your research!</i></p>	

Courtesy of Jim Kapoun [<http://www.ala.org/acrl/undwebev.html> and Kapoun, Jim. "Teaching undergrads WEB evaluation: A guide for library instruction." *C&RL News* (July/August 1998): 522-523]

which is developed and maintained by the American Heart Association (AHA) and is marketed by Laerdal (www.laerdal.com). The intent is that students review the excellent multimedia reference materials provided or other instructional resources and then have their knowledge and skills evaluated by the computer. Upon successful completion of the program, students receive an AHA course completion certificate (ACLS only) or renewal (BLS & ACLS) card.

This computer-based approach to instruction and certification offers several potential advantages to busy clinicians. First, the program is a particularly convenient and potentially more economical training alternative to formal classroom methods. Secondly, 24-hr availability and the ability of students to complete the

program at their own pace offers individuals enormous convenience. (However, students may not take the CD-ROM home for self-study on their home computer). Finally, automatic recording of students' results aids administrators in meeting AHA and other accreditation reporting requirements.

Each user is allowed up to 32 contact hours to complete the program; my experience is that experienced clinicians can complete the program in about one tenth that time. Because the time limits are very generous and because there is no penalty for failing a module, I recommend that students use the software in "evaluation mode" rather than in "practice mode". The cost for the system is \$99 USD per student "key" regardless of whether or not the program is successfully completed.

Users of the system complete five test modules in their training. These consist of (1) nine core cases (asystole, bradycardia, ventricular fibrillation etc.), (2) a test involving a series of EKG rhythm strips (static recognition), (3) a module on endotracheal intubation and airway management, (4) a “megacode” scenario, and (5) a written multiple choice examination.

I found the completion of the material to be straightforward except for the “megacode” scenario. In this section a number of video clips and rhythm strips are presented to the user and the student takes appropriate action by selecting from a number of options using their mouse. Experienced clinicians may find this section difficult to complete, not for lack of knowledge so much as the result of the awkward and user-hostile interface students must use. For instance, at one point in the scenario I was terminated (“fatal error”) for simply feeling the pulse after an attempted defibrillation (the correct response at that juncture was to check the rhythm only). In another attempt in the scenario I was terminated for checking for equal air entry when the software apparently wanted me to do something else. I eventually completed the “megacode” scenario, but it took me over a dozen attempts. Some tips to get you through: the software prefers antecubital *iv* access over placement of an *iv* in the hand; always yell “clear” before defibrillating; remember to get a chest *x-ray* immediately after placing a central line; during the first three countershocks in the ventricular fibrillation scenario check only the rhythm, not the pulse. Finally, be sure to review the file megacode.hlp for other time-saving pointers.

One particularly annoying feature I encountered was a video clip of a nurse that would occasionally pop up following one of my selections, asking me if I was sure about my choice of intervention. I soon discovered that her advice was generally valueless; her role is apparently to test your confidence in your knowledge rather than to warn you of unwise choices. Fortunately, real-world nurses are far more helpful.

Overall this is a useful but somewhat flawed program in need of more usability testing. I would rate it 3 out of 5 stars. Although there are other ACLS instructional software packages (perhaps even better ones), the HeartCode™ system is unique in offering a formal AHA ACLS certificate upon successful completion of the program. This alone will be the deciding factor in many cases. However, individuals who are not concerned about obtaining AHA certification may instead wish to consider the “Cardiac Arrest!” package from Mad Scientist Software (<http://www.madsci.com/cardiac/>), which is very inexpensively priced and which has been approved by the American College of Emergency

Physicians for up to 22.5 hr of Category I CME Credit. (Incidentally, Mad Scientist Software has generously placed on the Web a number of free ACLS Flowcharts (using the AHA 2000 Guidelines) that can be quite useful; these can be viewed at <http://www.madsci.com/manu/indxacsls.htm>). Another ACLS package to consider is Anesoft’s ACLS Simulator 2002 (<http://www.anesoft.com/products/acls/default.htm>).

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