

Working Draft

White Paper:

**Criteria for Assessing the Quality of
Health Information on the Internet**

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Electronic access at:

<http://www.mitrotek.org/hiti/showcase/documents/criteria.html>

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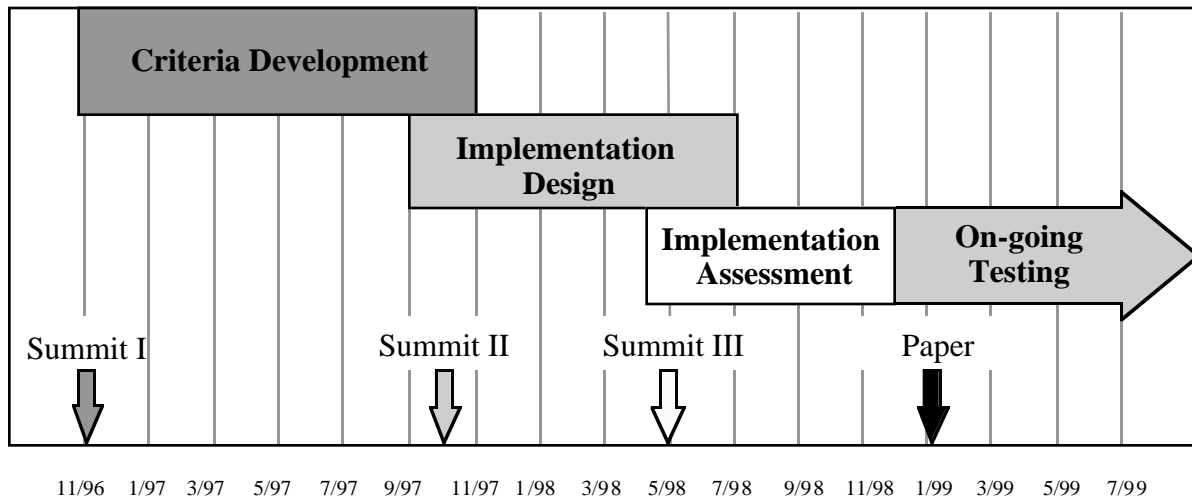
Preface

The purpose of this paper is to provide a set of criteria that can be used accurately and reliably by the general public (consumer) to assess the quality of health information on the Internet. We would like groups interested in this issue to contribute and become part of this effort. "We" represents all contributors to the development of this document.

We have identified, thanks to the effort of many individuals and organizations, a robust set of criteria that can help define the quality of the health information of an Internet website. The next step is to take these criteria and to develop them into criteria that can be used by the consumer of health information on the Internet. This will be the focus of the October 17, 1997 meeting at the Health Information Technology Institute of Mitretek Systems, Inc.

Remember, this is a working draft that is expected to undergo a series of significant edits. The up-dated time line shown below highlights where we are in the process and the planned activities for improving the document. Since we will continue to post improved drafts, please note the Edit Date of this document.

Time Line



We thank you in advance for your constructive comments regarding this document. To help in the editing process, please use the feedback form provided at the end of the document. You can send your comments via the form directly on our Web page (<http://www.mitretek.org/hiti/showcase/documents/criteria.html>) or fax them to Dr. Helga Rippen at (703) 610-2022. The names and organizations of those who provide significant contributions to this document will be added to the list of contributors.

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* This document does not necessarily reflect the official views or policies of the organizations listed above.

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Executive Summary

The Problem

The Internet can be a valuable resource for consumers to find more information relating to their health. It provides an easy and accessible forum to share, disseminate, and use information. However, anyone can post information on the Internet regardless of their background, medical qualifications, professional stature, or intention. With 36.7% of consumers now searching the Internet for health and medical information [1], the quality of that information becomes a critical issue. This issue will only become more acute in light of the rapid growth in the number of Internet users.[2]

This project addresses this problem by developing a set of criteria for assessing the quality of health information on the Internet. These criteria will form the basis in the development of necessary tools to educate and empower consumers to effectively evaluate the quality of Internet health resources.

Purpose

The ultimate aim of this project is to improve the quality of health information on the Internet. The goals are to develop criteria to assess the quality of health information on the Internet and to educate the consumer, the content provider, and the policymaker on these criteria. This project will help educate the consumer and will provide a much needed tool to assess the quality of health information on websites. Educating content providers on the criteria that identifies quality information will improve their ability to provide quality information on the Internet. This project will also include an ongoing study of the effectiveness and impact of this tool to aid policymakers in their decision-making regarding the Internet.

Criteria Identified

Based upon the work from Summit Meeting I and the comments received, the following criteria are being recommended as necessary for assessing the quality of health information:

- **Credibility:** Source, Context, Currency, Relevance/Utility, Editorial Review Process
- **Content:** Accuracy, Hierarchy of Evidence, Original Sources Stated, Disclaimer, Omissions Noted
- **Disclosure:** Purpose of Site, Profiling
- **Links:** Selection, Architecture, Content, Back Linkages and Descriptions
- **Design:** Accessibility, Logical Organization, Internal Search Engine
- **Interactivity:** Mechanism for Feedback, Chat Rooms, Tailoring
- **Caveats:** Alerts

Next Steps

- Continued review and improvement of the criteria to assess the quality of information available on the Internet.
- Coordination of the various efforts in developing these criteria.
- Development and testing of an Internet tool based on these criteria.
- Education of consumers, content providers, and policymakers on the use and existence of this tool.
- Long-term study on the effectiveness and impact of the tool and related activities.

1. Introduction

Purpose

Internet technology now provides access to an enormous volume and a broad variety of health information. This information may be from a leading expert with excellent documentation and a complete bibliography, or it may be in the form of emotional support from a friendly support group. Unfortunately, the Internet can also deliver sales propaganda, the latest medical rumors, or even the most sophisticated, pseudo-scientific scams. This makes it difficult for the user to determine which information is usable and credible; how it can be evaluated, critiqued, or verified; when it should be ignored, rejected, debunked, or erased; and whether to read, print, file, or download it.

The purpose of this document is to address the quality of health information on the Internet. Specifically, the document presents identified criteria to use to assess the quality of Internet health sites. A health site is defined as any site where information relating to topics that impact health (including wellness, disease, and treatment) or products and services related to these topics resides.

The Nature of the Problem

The explosive growth of the Internet is well documented. The number of devices accessing the Web will grow from 12.6 million worldwide in 1995 to 233.3 million by the year 2000 [3]. In fact, a new network joins the Internet every 30 minutes [4]. The number of people accessing the Internet has also grown—more than doubling in the past 18 months to 25 percent of the general population over the age of sixteen [5].

With this explosive growth has come an increased demand for information—especially health information. The demand for health information is reflected in the fact that currently, there are over 10,000 health-related websites [6]. A recent report [1] indicates that 36.7 percent of the general Internet user population accesses the Web to retrieve health and medical information. Moreover, unlike the general user, who has been reported as averaging only 3.5 hours a month on the Internet, those actively searching for health information are more likely to visit the Web daily [7].

Health information can be posted by anyone with access and an interest in doing so. The sources of the information range from product vendors to government to universities to medical centers to individuals. Many of these sources are authoritative and valid. Others, however, are well intentioned but misinformed, while still others may mislead the consumer. For example, hypertext links from one website to another may be wrongly interpreted by the consumer as implying the first site's endorsement of the other's product [8].

Thus, while there is a wealth of health information available, there is often no guarantee of its quality. Yet there is no field in which inaccurate, incomplete, or biased information is potentially more damaging; for example, people seeking online information may be convinced to ignore their symptoms or rely on unproven treatment strategies in lieu of professional medical treatment.

It has been pointed out that other forms of public communication, such as print and broadcast media, have the same potential as the Internet to disseminate false or misleading information. A difference, perhaps, is the ability of the Internet to bring individuals into direct communication in a way that has not been possible in the past. If consumers do choose to use the Internet to find health-related information, it may be best for them to approach health-related sites as places to gather background data and information on personal health issues. They may use this information as the basis for a more informed approach to their personal healthcare provider and the healthcare system. The information acquired may best be evaluated with the assistance of healthcare professionals.

The importance of information quality on the Internet was highlighted by a recent General Accounting Office report [9]. The problem is generally recognized, but there is no agreement on how to resolve it. Only a small number of websites display rating schemes; fewer still explain how they decided on that scheme or how the ratings have been applied. Given the importance of this issue, several written editorials on the issue of quality on the Internet have been published since the first Summit meeting [8,10,11]. In addition, there has been a study addressing the reliability of health information on the Internet [12]. It is hoped that this document will provide a focal point where all efforts addressing this issue can be incorporated.

Scope

In addition to Internet websites, users can obtain information through other Internet channels, including e-mail, mailing lists, listservs, newsgroups, bulletin boards, push technology, and chat rooms, where it is easier to post information with greater anonymity. Although important, these channels of information are not the focus of this document. Moreover, this document does not address information aimed at healthcare professionals (see the discussion of “Audience” below), but it focuses on health information intended primarily for the **general public**.

Approach

A variety of approaches have been used to assess websites; Appendix B provides a general overview of these approaches. This project’s approach differs from those used previously to assess health websites in that it *focuses on the quality of the information provided*, and not just on the websites’ design.

The first step was to assemble a one-day Summit Meeting held at Mitretek Systems in McLean, Virginia, on Friday, November 22, 1996. To ensure objectivity in the development of these criteria, a diverse group of individuals, including representatives of major professional, consumer, and government organizations attended (see Appendix C for a list of participants). During this meeting, the group contributed their expertise in developing, through consensus, the criteria determined necessary for assessing Internet health information quality. Prior work in the field was also used to help the process. In the following months, the group continued to communicate via Internet through a server maintained by Mitretek’s Health Information Technology Institute and e-mail. This document was outlined and sections were drafted collaboratively by individual members and small teams drawn from the original Summit group. A draft of the document was widely reviewed by the Summit members, and then submitted for outside review and comment.

Presentations at conferences discussing this work and criteria were made as another avenue for outside review. The conferences included the AMIA ‘97 Spring meeting, San Jose, California; Medical Webmaster’s conference, Washington, DC; and the Future of Health Technology ‘97, Boston, Massachusetts. In addition, discussions of this topic were made in various other meetings with individuals and associations to ensure a broad input base.

This document does not necessarily reflect the views or policies of the organizations that individual contributors represent. However, the final document will be presented for formal review to these and other organizations at which time they may determine to approve the document on behalf of their organizations.

Audience

The intended audience for this **document** are the policymakers, content providers, and the general public. This White Paper contains a robust set of criteria that are important to consider when determining the quality of an Internet site. These criteria will be further developed into a final set that can be used effectively by the general public and will be referred to as a **tool**.

The primary audience for the **tool** to assess the quality of health information on the Internet is the general public.

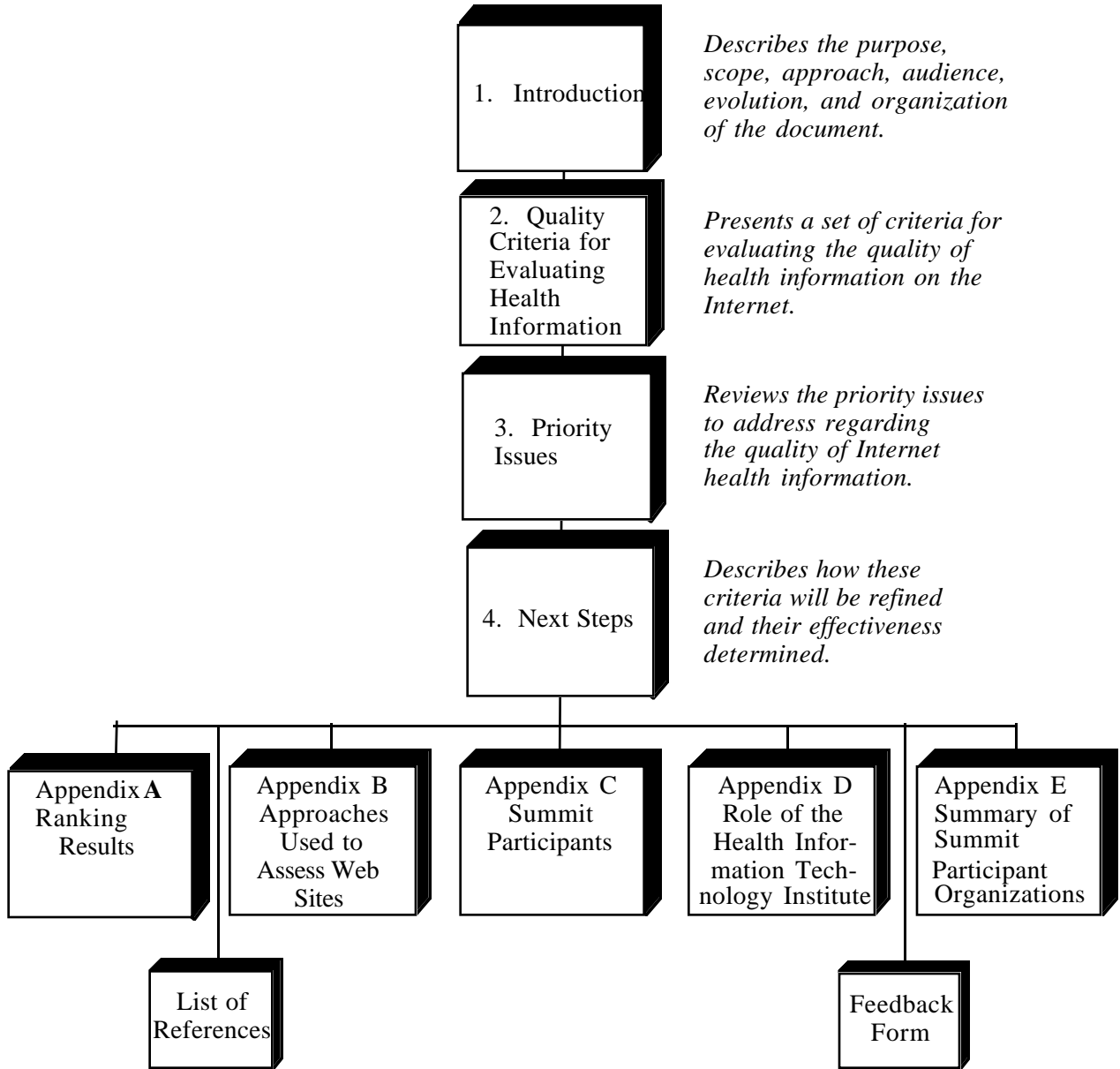
Considering the frequency of Internet access for health information and the potential impact of taking inappropriate action based on the information obtained, quality guidelines for these consumers should serve a valuable purpose. This document should also prove useful to policymakers, webmasters, and others with an interest in the quality of health information on the Internet.

Continued Evolution of This Document

The criteria presented in this document are intended to evolve and become more comprehensive by reflecting an enhanced understanding of users' needs. During this process, we will evaluate the reliability and accuracy of these criteria in assessing the quality of health information on websites. This includes field testing and tracking to ensure a useful, reliable and accurate tool. We ask for your help in this process. Please use the feedback form at the end of this document to provide suggested changes or additions.

Organization of This Document

This document is organized as shown in the following chart:



2. Quality Criteria for Evaluating Health Information

This section presents a set of criteria for evaluating the quality of health information on the Internet. The criteria fall into seven broad categories:

- Credibility (C1)
- Content (C2)
- Disclosure (C3)
- Links (C4)
- Design (C5)
- Interactivity (C6)
- Caveats (C7)

For ease of reference, the criteria are decimal numbered. For example, the specific criteria under C1, Credibility, are numbered C1.1 through C1.5. In some cases, the specific criteria are further broken down. For example, criterion C1.1 includes criteria C1.1a through C1.1d. Note that because of the complexity of some of the criteria, there are several areas of overlap, which are identified through cross-referencing.

Table 1 lists the top ten ranked original criteria (how critical they are) as “Essential,” “Important,” or “Desirable.” These rankings are also shown in parentheses next to the title of each criterion in the text. Note that in this draft, the results shown in Table 1 were collected from 28 respondents by September 1997 (see Table A-2 in Appendix A for the entire list). Based on some of the comments, it was apparent that all respondents had not used the criteria as defined in this paper in their ranking. The results of a more detailed survey (see Table A-1 in Appendix A), that will be distributed prior to the Health Summit II meeting October 17, 1997, will be added. We ask that in addition to making comments on the feedback form at the end of the document, you also complete Table A-1. This information you provide will be used to update Section 3 on priority issues—identifying those criteria most critical in assessing quality and how they will be implemented.

TABLE 1. PRIORITY RANKING OF QUALITY CRITERIA.

The top 10 results of respondents to the survey. (n=28, 9/30/97 based on original draft) (# was determined by adding all comments ranked as essential and important and dividing by n).

#	Criterion	Ranking			
		Essential	Important	Desirable	Other/ Blank
1	C1.1 Source	23 (82%)	5 (18%)	0	0
2	C2.1 Accuracy	26 (93%)	1 (4%)	0	1 (4%)
2	C1.2 Disclosure	21 (75%)	6 (21%)	1 (4%)	0
3	C2.3 Original Source Stated	21 (75%)	5 (18%)	2 (7%)	0
3	C1.3 Currency	12 (43%)	14 (50%)	2 (7%)	0
4	C2.2 Hierarchy of Evidence	12 (43%)	12 (43%)	3 (11%)	1 (4%)
5	C1.4 Relevance/Utility	10 (36%)	13 (46%)	4 (14%)	1 (4%)
6	C2.4 Disclaimer	10 (36%)	11 (39%)	5 (18%)	2 (7%)
6	C3.3 (Link) Content	6 (21%)	15 (54%)	10 (36%)	2 (7%)
7	C1.5 Review Process	5 (18%)	14 (50%)	8 (29%)	1 (4%)

C1 Credibility

There are five criteria for evaluating the credibility of Internet health information:

- Source (C1.1)
- Context (C1.2)
- Currency (C1.3)
- Relevance/Utility (C1.4)
- Editorial Review Process (C1.5)

C1.1 Source

Source is divided into the following four subcategories - source, credentials, conflict of interest and bias.

C1.1a Source

Overall, the source of medical information is the premier criterion for its credibility and quality. Credibility is defined by *Merriam Webster's Collegiate Dictionary, 10th Edition*, as “the quality or power of inspiring belief,” and to be credible is defined as “offering reasonable grounds for being believed.” [13] To a great extent, the problems associated with distinguishing credible from less credible or even false information relate to the problem of accurately evaluating the source. A site should display the institution's or organization's name and logo as well as the name and the title of the authors.

There is no simple method for objectifying the credibility of Internet sources. The characteristics of a credible source, however, follow from some logical or common-sense rules. The trusted authorities in a society are usually easily identified, and information that comes from or can be attributed to a trusted authority is credible. An authority is defined by *Merriam Webster's Collegiate Dictionary, 10th Edition*, as “an individual cited or appealed to as an expert.” [13] For example, the medical advice provided by physicians relating to an illness is considered credible unless proven otherwise. Individual health care providers and organized groups of health care providers are clearly sources of authoritative medical information. Organizations such as consumer advocacy groups, voluntary health-related organizations, public health communities, and patient support organizations can also be considered credible sources of information relating to their area of expertise. Indeed, organized groups of experts may be considered to have greater authority than individual experts given the likely focusing of collective knowledge on a given issue. Similarly, hospitals, large group practices, government

health agencies, and other entities that bring together medically knowledgeable professionals have aggregate credibility. University medical schools may have the highest degree of medical credibility given that they are expected to represent collections of physician specialists who are working at or extending the leading edge of medical knowledge. Individual healthcare professionals generally gain increased credibility by virtue of an association with these highly credible groups.

C1.1b Credentials

Evaluation of the credibility of the source of Internet information requires that the source disclose its qualifications/credentials and relevant personal or financial associations (see section C3). However, it may be difficult to evaluate the credentials of a source even when they are properly disclosed. This is particularly true in the field of medicine. For example, because of the complexity of medical knowledge and the resultant proliferation of medical and healthcare specialists, consumers may find it difficult to ascertain the scope of legitimate practice for various healthcare professionals. This problem is compounded by the fact that even credentialed healthcare professionals may extend their consultation beyond their areas of training and expertise. To illustrate this problem, an individual who was not a physician or trained in tissue transplants, at a prestigious university medical center, found that his website was drawing questions of a general medical nature. He then proceeded to provide advice on medical diagnostics, and even on the decision to undergo a tissue transplant. Moreover, it may be difficult to discriminate in seeking sources for second opinions when confronted by the multitude of medically related sites on the Internet.

Anonymity on the Internet is a problem as well. There is no easy way to verify disclosed credentials to be certain they are valid. This situation will change in the future as more health care provider databases are available over the Internet. For example, a remedy for the physician segment of the healthcare provider population is the availability of the American Medical Association (AMA) physician database on the AMA website. The academic credentials and training history of many physicians in the United States can be found at this site. State medical societies are developing similar services covering local physicians as are other professional societies (e.g., nursing).

C1.1c Conflict of Interest

The potential for conflict of interest in the information provided can be difficult to assess. Users may lack the specialized knowledge needed to distinguish between a balanced and an

unbalanced presentation on many medical issues. Disclosure of sponsorship and the nature of the support provided can allow some assessment of potential conflicts of interest. Industry sponsorship of sites should not be construed to compromise the site's content validity. If there is an advertisement associated with a site, one should consider the potential motivation of the sponsor. Sites created and maintained by product manufacturers can be expected to cast their products in the best possible light and should be viewed with that in mind. In general, if a product is given glowing reviews only from sites sponsored by the manufacturer, the user should be skeptical. Additionally, patient "educational" material may in fact just be promotional.

C1.1d Bias

Bias can be financially motivated, or it can be the result of a personal intellectual investment or slant towards a particular idea or theory. Well-qualified and even prestigious individuals are susceptible to this limitation. The public is increasingly well-educated and curious, but even the well-educated Web surfer is unlikely to have the scientific background needed to critically evaluate medical information.

C1.2 Context

It is important for the consumer to know the context (or setting) in which health information is provided. Two examples of the importance of context are in advertising and the treatment of a specific disease. In the former case, when information is provided as part of an advertisement or endorsement relating to a product, it needs to be labeled as such so the consumer can tell that the information is given in the context of selling a product (see C1.1c). The context for a treatment can be the specific disease for which the treatment has been shown to be effective. For example, if drug X has been shown to be effective specifically for preventing migraine headaches, it is not appropriate to discuss it as a product that prevents all headaches.

C1.3 Currency

Currency in health-related websites can be defined as keeping up to date with the present state of medical/clinical knowledge. Currency is expected on the Internet site of a credible source, but in reality, this may fall short. The initial burst of enthusiasm that prompts a medical author to produce a website may soon be tempered by the realization of the time and effort involved in keeping the site up to date.

The date of the original document and the date of content posting should also be displayed so the user can judge the timeliness of the information. Though the date of posting does not demonstrate that the information provided is correct or current, it does provide an indicator of currency. For example, if there was a recent discovery relating to the treatment of a disease, a site discussing treatment options dated several months ago probably would not include this discovery. Areas with rapid developments such as AIDS research, demand very current information. For this reason, it is best to talk with healthcare providers regarding the timeliness of the information.

C1.4 Relevance/Utility

Relevance and utility are attributes that will benefit the user of a site. Relevance relates to how closely the actual content of a site corresponds to the information it purports to provide. For example, if a site's heading mentions recipes for diabetic patients, a recipe for non-diabetics may not be relevant.

Utility denotes the usefulness of a site. For example, suppose a user wanted to quit smoking, but did not know how to go about it. A site intended to help people stop smoking would not have much utility if it only discussed the reasons to stop smoking and did not provide tools that would help in actually doing so.

C1.5 Editorial Review Process

There is no editorial control over material on the Internet because there is no control over the Internet in general. In an academic community, the function of editorial control is effected by a peer review process; the general public is more likely to understand a "seal of approval" from an individual or group commonly perceived as credible (see C1.1). However, the idea of implementing an approval program is laden with difficulty. It is generally discounted as an impossible undertaking given the large number of Internet nodes or server computers and the ever-changing nature of the content of electronic documents.

Another confounding factor in the evaluation of valid medical information is the variability in opinions among individual medical experts. These experts may have legitimate but differing opinions on certain issues. This variation arises, at least in some cases, from differing professional experiences in areas of therapeutics where there is little solid evidence on the effectiveness of various treatment approaches.

Sites that do have an editorial process should state so and describe the process and the individuals involved.

C2 Content

There are five criteria for evaluating the content of health information on the Internet:

- Accuracy (C2.1)
- Hierarchy of Evidence (C2.2)
- Original Source Stated (C2.3)
- Disclaimer (C2.4)
- Omissions Noted (C2.5)

C2.1 Accuracy

The accuracy, or scientific validity, of information is perhaps the most obvious criterion for quality of content. Accurate content is based on evidence and its verification (see C2.2 below). The validity of the information should be explained and the underlying data that led to the conclusions presented.

Although the general public is at a disadvantage in attempting to determine the accuracy of health information, consumers should always be highly skeptical of claims of “amazing results,” “earthshaking breakthroughs,” or the “secret cure” known only to the purveyor. Likewise, they should be wary if basic science, widely accepted medical principles, or sound public health policies are attacked.

C2.2 Hierarchy of Evidence

Although much of the healthcare information available on the Internet is written at a level the general public can understand, it should still reflect the principles of evidence-based medicine, including sound research and expert opinion.

Clinical or scientific evidence to support a position should be clearly presented. For example, an article about a particular type of cancer therapy should include a discussion of a supporting study. The framework of the study should be described in language the lay person can understand. What was the scope and what were the limitations of the study? Was the assignment of patients to treatments randomized? What were the results and conclusions of the study? Do other studies substantiate the theory? Do other sources (for example, peer-

reviewed journal articles) support the theory? Consumers should be aware that testimonials should be used only to provide real world examples of a theory, not as evidence.

Table 2 depicts the validity of the various types of health research for the consumer to consider to determine the accuracy of the medical study. For example, if Drug X was shown to help lower blood pressure in a randomized controlled study, this is good evidence to believe that Drug X worked. On the other hand, if an individual tried Drug Y and found that his/her blood pressure was lowered, one would not be sure that Drug Y would lower blood pressure for other people.

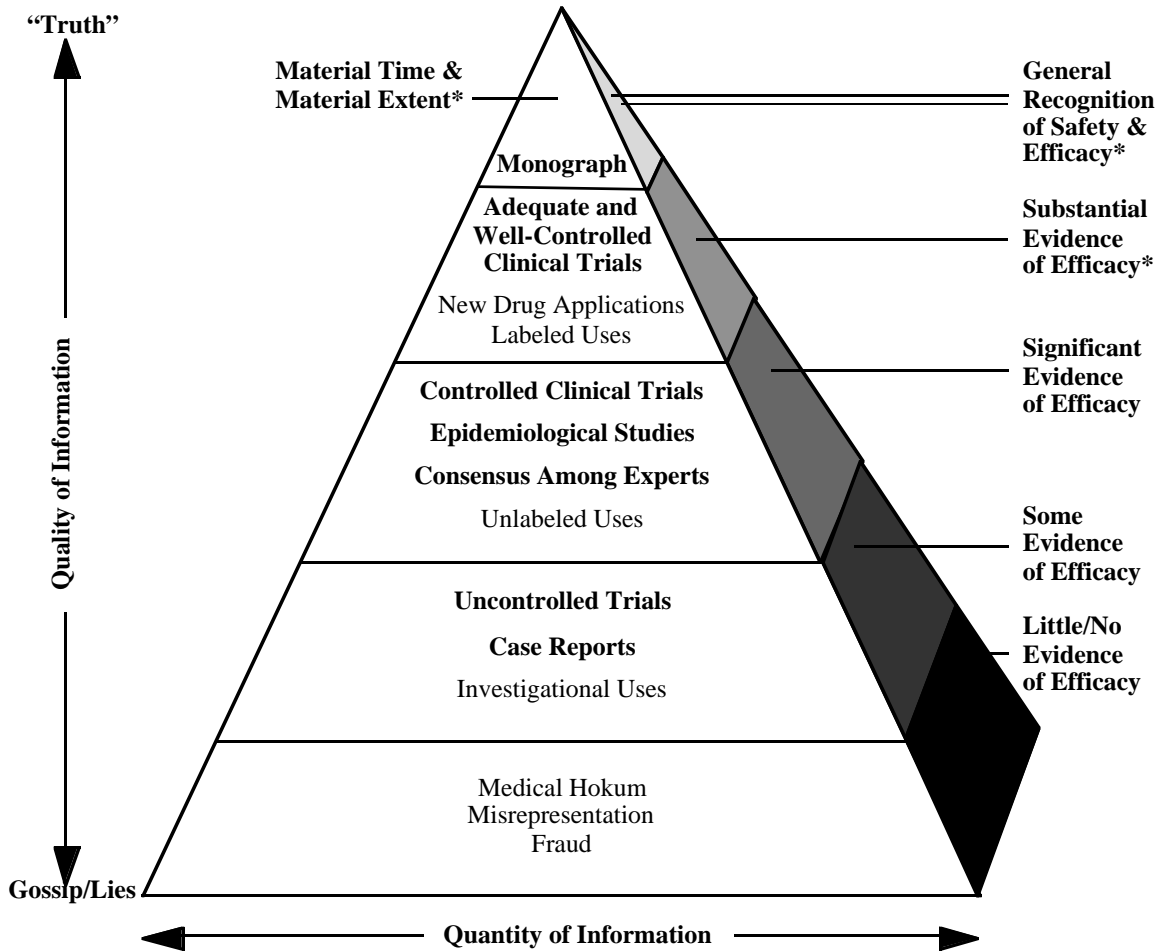
TABLE 2: VALIDITY OF EVIDENCE

VALIDITY OF EVIDENCE	WHAT TO LOOK FOR
++++(Best Evidence)	Randomized controlled trials
+++	Non-randomized controlled trials
++	Well designed cohort or case-control analysis
+ (Least Evidence)	Opinions of respected authorities, case reports, descriptive studies, reports of expert committees
No Evidence	Misrepresentation, fraud

An example of a Drug Trial specific approach from United States Pharmacopeia is shown in the figure below that captures the paradigm of “significant evidence or efficacy” versus standards.

C2.3 Original Source Stated

If the content is not original information, its source should be clearly indicated. Credentials of the author(s) or source should be clearly shown. Documentation of the author’s expertise would be beneficial (see also C1.1). An author's affiliation with a sponsor or the author’s personal viewpoint/opinions should be noted to indicate possible bias or lack of objectivity (see also C1.1c and C1.1d). The source should also indicate whether an organization has a particular long-term interest in a subject (e.g., the Arthritis Foundation could be a good source of information on rheumatoid arthritis). The user should always be skeptical of information posted by an anonymous source (see also C1.1).



*Statutory Standard—Federal Food, Drug & Cosmetic Act

Source: USP
Since 1820

Example Figure: Paradigm of “Significant Evidence of Efficacy” vs. Standards

C2.4 Disclaimer

The disclaimer should describe the limitations, purpose, scope, authority, and currency of the information. To ensure accuracy and avoidance of plagiarism and copyright violation, sources of the information (see also C1.1 and C2.3) and reporting errors should be disclosed. It should also emphasize that the content is general health information and not medical advice, thus, addressing liability concerns. It should state clearly that only a physician, pharmacist, or other health professional can best advise an individual on matters of his/her health based on personal and family medical history and other factors discovered and documented in the health professional/patient relationship. The disclaimer should also clearly define the relationship, in terms of the scope of responsibility and control, between the original website content and links to other sites.

C2.5 Omissions Noted

Completeness is important to the quality of healthcare information. A comprehensive review of a topic should be presented, not a one-sided view with critical information missing. Pertinent facts and negative results about the subject should not be omitted. Claims for a particular type of therapy or drug should be substantiated. If the author or source of the information does not have all the facts to present, this should be noted.

Although an article or website can certainly endorse or favor a particular type of treatment, it should provide a balanced presentation of all sides of an issue. The information presented should be complete, and the user should be alerted to any obvious omissions. For example, an article that discusses surgical treatment for a disease should also include some discussion of medical (nonsurgical) treatment options, if any. If a site is dominated by information advocating or advancing a particular point of view or promoting a product or treatment, that should be clearly indicated on the site (see also C1.1c and C1.1d).

A thorough, valid, reliable article or website should include references to other reputable sources, preferably peer-reviewed journal articles, established medical reference books, and authoritative texts. The dates of information creation and posting should always be included (see also C1.3). These dates will be good indicators of the timeliness and validity of the information.

C3 Disclosure

It is important for consumers to understand the organizational or the individual's intentions of their websites. There are two criteria to determine appropriate disclosures:

- Purpose of the site
- Profiling

C3.1 Purpose of the Site

The mission statement or purpose of the site should be displayed or clearly stated for consumers to understand how best to utilize the information. For example, if the purpose of the site is to simply provide a collection of medical advertisements, it should be stated. Additionally, it is important that the site match its mission or purpose.

C3.2 Profiling

Increasingly, websites are requesting information and using information for purposes that the users may be unaware of. It is critical that consumers be alerted of the collection, use, and dissemination of their information in order for them to make informed decisions to either provide information and/or approve of its eventual use. When a website asks for user input or registration, be it in a form or a search, the purpose and use of obtaining that information should be disclosed before it is submitted or the user registers. The user should also have the right to disallow this information to be forwarded to others for promotional or other purposes.

The following should also be specified: who is sponsoring the site (C1.1a), the purpose of the site (C3.1), whether the information will be retained and if so by whom, whether information regarding the user's computer or service is being obtained, whether user use patterns are being captured, what the information will be used for, and whether it will be given to others.

C4 Links

Links are connections to other internal pages or to external sites. They form the web-like structure of information searches within and between sites. At best, links help conserve Web access time and point the user to additional, valuable resources with minimum effort. At worst, they can reduce site credibility, lose the reader in navigating among linked sites, and add little information of value. It is important that users be alerted when they are moving to an external site. Information relating to the linked source (before the user clicks to the site) or placement of transition screens so that movement to a new site is apparent has been suggested as solutions to this problem. In addition, sources could be identified in a similar manner as print journals - where the name appears in the header or footer of the "page."

Especially critical to the quality of an Internet site are its external links—their selection, architecture, and content. There are four criteria for evaluating the quality of links:

- Selection (C4.1)
- Architecture (C4.2)
- Content (C4.3)
- Back Linkages and Descriptions (C4.4)

C4.1 Selection

The selection of links is made by someone at the originating site. Issues relating to link selection include whether the person or group making the selection has the authority, expertise, and credentials to do so (see also section C1.1). Also relevant is the level of the intended audience. The original and linked sites should target a set of readers with similar characteristics. For example, a site aimed at children should avoid links to sites for adults.

Other issues include whether there are too few links to external sites or too many; whether the external sites are readily available or have been closed down or moved; and whether the linked sites are commonly referenced and thus found repeatedly in searches, adding little new knowledge and frustrating the user. Some groups that have defined quality criteria for assessing Internet sites suggest that a site is low-quality if what it has to offer is limited original content and few links [14]; others suggest that meta-lists of linked sites can be useful if properly identified, structured, and authenticated.

C4.2 Architecture

With regard to the architecture or design of pointers to linked sites, questions arise regarding ease of navigation: whether there are timely escape mechanisms during side searches; whether the user can easily find his or her way backwards and forwards; and whether the structure is logically apparent to the reader (see also C5.2). Image-based icons and textual identifiers should be meaningful and consistent. A brief description of the site to be linked helps the user decide whether to pursue the link. Furthermore, providing a tree structure or an organized grouping of links may be helpful.

C4.3 Content

Content is as important as selection and architecture in assessing the quality of links. The content should be accurate, current, credible, and relevant. The content of the originating site is enhanced if it includes links to high-quality sites such as those maintained by recognized federal health agencies in order to reinforce its own credibility. On the other hand, linking to a poorly designed site or one with low content validity suggests that the quality rating for the originating site should be lowered.

C4.4 Back Linkages and Descriptions

Back linkages are links to one website from another. They are similar to the references (or citations) to source materials in books and journals. Back linkages are a relative measure of a website's popularity (number of other websites linking to this one) and quality (reputation and authority of the websites linking to this one). Many websites track and publish back linkages for the purpose of enhancing their credibility and marketability. The best way to evaluate back linkages is to examine the context in which they are used, that is, their purpose, relevance, credibility, and authority. Point of view, including any bias, is also meaningful in evaluating back linkages (see also C1.1d).

C5 Design

Design is defined as the layout of the website, from the art and text to the links. Although design is important in ensuring effectiveness in the delivery and use of health information, it does not impact the quality of the information per se. Nevertheless, it is important to ensure that the site is laid out in such a way as to enhance the delivery of the information. There are three criteria for assessing the design of websites:

- Accessibility (C5.1)
- Logical Organization (Navigability) (C5.2)
- Internal Search Engine (C5.3)

C5.1 Accessibility

Websites should be accessible by the lowest common denominator of current browser technology. Although the latest plug-ins and features available with high-technology capabilities may make the site attractive to some users, many other users will not be able to access the site or make use of the information if high-end technology is required. Other features to improve access include options for assessing the information when multimedia browsers are not available, and options for enabling use by the hearing and seeing impaired.

C5.2 Logical Organization (Navigability)

Logical structuring is essential for effective consumer use of information. Simplicity of design leads to ease of use. Ease of returning to the homepage or to the top page of any specific section of the site is a key navigation criterion. The best websites are clearly focused on their purpose and target audience, are logically structured, and are simple, consistent, clear, and easy to use. They reflect an awareness of reading level, language, labeling, listing, cross-referencing, and comparison/contrast. A balance of words, pictures, colors, sounds, and motion may enhance absorption of the information. One needs to be aware that sophisticated presentations might detract from one's assessment of the quality of the information.

C5.3 Internal Search Engine

An internal search engine is a critical component of any website with depth and breadth of content. The scope and function of the search engine—what it covers and how it works—should be clearly described. Many websites use multiple, special-purpose search engines, so clarity of the search engine purpose and scope is important. The search engine should be capable of searching specified content by keyword or search string and retrieving only relevant materials. The user interface should be simple, easy to use, full featured, and have a clean display of its output. The search engine should operate swiftly and efficiently. Depending on the content provider's purpose and scope, the search engine may not cover all site content, or it may cover content that is linked and geographically distributed. Users should have the option of easily manipulating the search strategy to search only a section of a website or the entire site.

C6 Interactivity

Interactivity includes three criteria:

- Mechanism for Feedback (C6.1)
- Chat Rooms and Bulletin Boards (C6.2)
- Tailoring (C6.3)

C6.1 Mechanism for Feedback

Reputable journals provide a feedback mechanism for their readers, and so, too, should websites. The capability for interaction is a unique benefit of the Internet. For example, a link to send criticism and comments to the site's sources should always be included with the

original information. Users should be able to comment on the validity and value of the information, and possibly point out areas of omission or obvious bias. A professionally operated website will endeavor to respond to user feedback within a reasonable amount of time.

C6.2 Chat Rooms

Chat rooms allow information to be exchanged among many individuals, often anonymously. Whether a moderator is present should be posted, along with a warning that the information may not be accurate. If a moderator is present, the individual should be identified, together with his/her expertise and affiliations, and the source of his/her compensation (see C1.1).

Bulletin Boards allow users to engage in non-real-time discussion at various websites. Again, if postings are provided, identification of healthcare providers should be stated.

C6.3 Tailoring

In cases where a website provides an interactive service, such as tailoring information to the user based on clinical algorithms, the algorithm used should be stated, including its developer and the site's affiliation with the developer.

C7 Caveats

Consumers should recognize that while use of the Internet for health information can be a wonderful and educational experience, it can also have potential drawbacks. In particular, personal information may be easily given, stored, and shared for purposes that users may not be aware of or agree to those uses. Additionally, information may be inaccurate, thus, the consumers must be alerted to potential quack medical claims.

C7.1 Alerts

The consumer must be wary of sound-a-like names or names that seem prestigious. Impressive names, conceived by shrewd marketing strategists, can be quite misleading. For example, the American Institute of Drug Analysis may sound like a well-equipped research facility with academically credentialed staff, but it may in fact be a poorly instrumented and staffed laboratory in a garage. There is no legal restriction on the naming of businesses.

Consumers also must be highly skeptical of claims of “amazing results,” “earthshaking breakthroughs,” or “miracles,” as well as “secret cures” known only to the purveyor. Likewise, they should be wary if basic science, widely accepted medical principles, or sound public health policies are attacked.

Example Checklist for Assessing the Quality of Internet Health Information

Criterion	Points*
Credibility (C1)	
<input type="checkbox"/> The source is credible. (C1.1a)	
<input type="checkbox"/> Qualifications/credentials and relevant personal or financial associations are disclosed. (C1.1b)	
<input type="checkbox"/> The information is current. (C1.3)	
<input type="checkbox"/> The information has relevance and utility. (C1.4)	
<input type="checkbox"/> There is some indication that the information has undergone an editorial review process (e.g., a “seal of approval”). (C1.5)	
Content (C2)	
	Etc.

* Assignment of points might be based on a scale of 1-5, in accordance with the priority rankings given in Table 1. Points could then be totaled, either within each of the five major criteria or overall, and a quality “grade” assigned to each range (e.g., 1-10 = poor, 11-20 = fair, etc.).

3. Priority Issues

To date, the following have been selected (essential and important rankings) as the top ten criteria:

- Source (100%)
- Disclosure (97%)
- Accuracy (97%)
- Currency (93%)
- Original Source Stated (93%)
- Hierarchy of Evidence (86%)
- Relevance/Utility (82%)
- Disclaimer (75%)
- Link - Content (75%)
- Review Process (68%)

The response rate was 28 and based on the form shown in Table 1. It is important to note that there were no descriptions on the form that described the criteria in detail and it was apparent that some respondents had not used the White Paper definitions of the criteria in ranking them. Another ranking will be performed prior to the October 17, 1997 meeting.

4. Next Steps

The steps checked off have been implemented while the others are in the process of being implemented or designed. They are as follows:

- ✓ Identify criteria to assess Internet based health information.
- ✓ Ensure that there is broad representation and feedback mechanism in the continued development of these criteria and the process.
- ✓ Work toward a general consensus on the criteria.
- Develop criteria into a tool so that it can be used by the general public.
- Test the tool to ensure validity and reliability.
- Educate the public, web developers and policymakers on how to best use these criteria and the tool.
- Implement the use of the tool.
- Track the implementation and effectiveness of the tool and criteria.
- Continue to develop the criteria as needed.

Appendix A: Ranking Results

TABLE A-1: RANKING AND IMPLEMENTATION OF CRITERIA.

Importance (IMP) - reflects the importance of this criteria on assessing the quality of the information. 4 - Essential, 3 - Important, 2 - Desirable, 1 - Indifferent, 0 - Not at all. **Ease of Implementation (Ease)** - reflects how easy it will be to develop the criteria in a consumer useable way, 4 - very easy, 3 - moderately easy, 2 - minor difficulty, 1 - substantial difficulty, 0 - would not be able to do. **Ideas on how to implement this criteria** - how the criteria could be assessed by a consumer (e.g., under the criteria Credentials: Is the name of the author listed?(Yes/No) Are his/her credentials listed? (Yes/No)

	Ranking		How to Implement
Criterion	IMP (4-0)	Ease (4-0)	How to implement this criteria
Example: Credentials	4	3	<ul style="list-style-type: none"> • Is the name of the author listed? (Y/N) • Are his/her credentials listed? (Y/N) • How well do the credentials match the text? (5 – perfect match, 0 – not related)
C1 Credibility			
C1.1 Source			
C1.1a Source (e.g., organizational information)			
C1.1b Credentials			
C1.1.c Conflict of Interest			

C1.1d Bias			
C1.2 Context (e.g., advertising, medical condition)			
C1.3 Currency			
C1.4 Relevance/Utility			
C1.5 Editorial Review Process			
C2 Content			
C2.1 Accuracy			
C2.2 Hierarchy of Evidence			
C2.3 Original Source Stated			
C2.4 Disclaimer			
C2.5 Omissions Noted			

C3 Disclosure			
C3.1 Purpose of the site (e.g., promotional, educational)			
C3.2 Profiling (capture, sharing)			
C4 Links			
C4.1 Selection			
C4.2 Architecture			
C4.3 Content			
C4.4 Back Linkages and Descriptions			
C5 Design			
C5.1 Accessibility (e.g., can be used with low-end device)			
C5.2 Logical Organization			
C5.3 Internal Search Engine			

C6 Interactivity			
C6.1 Mechanism for Feedback			
C6.2 Chat Rooms (e.g., moderator present)			
C6.3 Tailoring (e.g., based on what algorithm, e.g., AHCPR)			
C7 Caveats (or others)			
C7.1 Alerts			

TABLE A-2. PRIORITY RANKING OF QUALITY CRITERIA.

Results of respondents to the survey. The top 10 criteria are bolded. (n=28, 9/30/97 based on original draft) (# was determined by adding all comments ranked as essential and important and dividing by n).

#	Criterion	Ranking			
		Essential	Important	Desirable	Other/ Blank
	C1 Credibility	24 (86%)	0	0	4 (14%)
1	C1.1 Source	23 (82%)	5 (18%)	0	0
2	C1.2 Disclosure	21 (75%)	6 (21%)	1 (4%)	0
3	C1.3 Currency	12 (43%)	14 (50%)	2 (7%)	0
5	C1.4 Relevance/Utility	10 (36%)	13 (46%)	4 (14%)	1 (4%)
7	C1.5 Review Process	5 (18%)	14 (50%)	8 (29%)	1 (4%)
	C2 Content	19 (68%)	3 (11%)	0	6 (21%)
2	C2.1 Accuracy	26 (93%)	1 (4%)	0	1 (4%)
4	C2.2 Hierarchy of Evidence	12 (43%)	12 (43%)	3 (11%)	1 (4%)
3	C2.3 Original Source Stated	21 (75%)	5 (18%)	2 (7%)	0
6	C2.4 Disclaimer	10 (36%)	11 (39%)	5 (18%)	2 (7%)
8	C2.5 Logical Organization	4 (14%)	14 (50%)	9 (32%)	1 (4%)
13	C2.6 Internal Search Engine	1 (4%)	10 (36%)	14 (50%)	3 (11%)
11	C2.7 Mechanism for Feedback	8 (29%)	7 (25%)	13 (46%)	0
8	C2.8 Omissions Noted	9 (32%)	9 (32%)	8 (29%)	2 (7%)
13	C2.9 Back Linkages and Descriptions	5 (18%)	6 (21%)	14 (50%)	3 (11%)
9	C3 Links	4 (14%)	13 (46%)	6 (21%)	5 (18%)
10	C3.1 Selection	5 (18%)	11 (39%)	10 (36%)	2 (7%)
12	C3.2 Architecture	2 (7%)	10 (36%)	13 (46%)	3 (11%)

6	C3.3 Content	6 (21%)	15 (54%)	10 (36%)	2 (7%)
9	C4 Design	4 (14%)	13 (46%)	10 (36%)	1 (4%)
12	C5 Interactivity	2 (7%)	10 (36%)	11 (39%)	5 (18%)
11	C5.1 Comment Options	4 (14%)	11 (39%)	12 (43%)	1 (4%)
15	C5.2 Chat Rooms	0	4 (14%)	21 (75%)	3 (11%)
14	C5.3 Profiling	1 (4%)	4 (14%)	18 (64%)	5 (18%)
	Other (Please specify)				

Appendix B: Approaches Used to Assess Websites

There has been much discussion of the issue of assessing websites. It is not the intent of this appendix to review all of the assessment criteria and articles published to date. Rather, this appendix provides a general overview of the approaches used. For those interested in reviewing rating sites and articles in more detail, listings of the numerous bibliographies on assessing Internet sites are available [15, 16].

The information on assessment can be divided into two general categories based on what is provided: ratings of sites and rating tools. In the former group, ratings are posted as a seal on the reviewed site or as a listing of sites included in a clearinghouse (if they meet the quality criteria). Rating tools vary from general pointers to detailed checklists. One review of existing rating criteria can be found on <http://www.tiac.net/users/hope/findqual.html> [17].

Ratings of Sites

There are numerous sites that attempt to review other sites. These sites often have vague review criteria and do not use health domain-specific guidelines. Examples of review sites and their indicators include the following:

- Magellan—depth, ease of exploration, and net appeal [18]
- The Six Senses Review—content, aesthetics, interactivity, innovation, freshness, and character [19]
- Top 5% Sites from Point (Lycos)—content, presentation, and overall experience [20]
- Greatest Hits—sponsor, description, audience, design, graphics, navigation, links, and interactivity [21]
- Infofilter—technical information, review (authority, content, organization, currency, search engine, and accessibility) [22]

Most of these sites do not provide a detailed explanation of how they determine their ratings. Yet despite the ill-defined evaluation criteria, many of the sites evaluated receive poor reviews. For example, an assessment of the 857 health and medical resources reviewed by

Magellan, The Six Senses Review, and the Top 5% Sites from Point resulted in an average score of 59 percent (out of 100) [23].

One domain-specific Internet site is Physicians' Choice, which relies on physicians to volunteer to review a site. The review is based on total points (50) and assesses harmony (5 points); links (5 points); original content (26 points); utility for practicing physicians (10 points); and overall quality, defined as how the user liked it (4 points). In addition, the target audience (ranging from specific medical professionals to the lay person) and features are identified [15]. The 1996 *Healthcare Guide to the Internet* is a publication for the healthcare provider that has a rating guide covering content, style, and interface [24].

Providing a clearinghouse of "quality" sites is another approach to addressing the quality issue. An example is a clearinghouse that posts guides and evaluates them by the following criteria: level of resource description, level of resource evaluation, guide design, guide organizational schemes, and guide to meta-information [25].

As can be seen from the poor average quality of the available websites, the nonspecific evaluation techniques applied, and the relatively small number of evaluated sites, no Internet "quality filter" exists to date. And certainly there is no consensus and no robust guidelines for health-specific information for the lay person.

Rating Tools

Literature targeting the general public often discusses techniques that can be used by the lay person to find "good" information on the Internet. For example, *Consumer Reports* provides general pointers such as considering the source, knowing where one is (address pointers), watching for red flags, and getting a second opinion [26]. Others recommend focusing on the currency of the information, the author, and the sponsorship. These recommended tools for the lay person are quite general and may not really help in making an informed decision about the information available on the site.

More detailed evaluation tools are available. These tend to be targeted to the developer, librarian, or educator. They are often checklist guides to determine how good a website is. "Fifty-Ticks for a Good Web Site" is an example [27]. This guide has 50 yes/no questions covering a variety of topics including speed, layout, links, disclosures, structure, references, originality, and achievement of purpose. If a score of less than 20 is obtained, the user knows there is a problem with the site. One checklist targeting the lay person asks questions relating

to the user's knowledge of the materials, authority, time, scope, form, clarity, recommendations from friends relating to the site, validity (how true the user thinks the information is), and importance [28].

The library community has many sites that discuss how to approach information obtained on the Web critically. It is not surprising that this approach tends to be more detailed. Examples include the following:

- Thinking Critically About World Wide Web Resources—content and evaluation, source and date and structure [29]
- The Web as a Research Tool: Evaluation Techniques—accuracy, authority, objectivity, currency, coverage [30]

A domain-specific site on the Internet is Pharmaceutical Resources. Here the positive characteristics include updated, authoritative, e-mail contact, feedback, relevant and useful, references, searchable, and disclaimers. Negative characteristics include excessive advertising, browser-specific, no credit given for information, and an alert about the meaning of external rating systems (does not mean quality). Another domain-specific checklist is one developed by Dr. John Renner, which is divided into technical criteria, content criteria, credibility criteria, usefulness criteria, and linkages to other pages [31]. To help users identify sites that considered questionable, Quackwatch by Dr. Stephen Barrett lists 25 ways to spot quackery [32].

In addition, there are some ongoing activities related to the development and assessment of website quality evaluation tools. For example, a project within the University of Georgia is establishing information quality criteria for Internet resources. The audience for this endeavor consists primarily of educators. The project has developed a list of 125 indicators, grouped within the following 11 categories [33]:

- Site access and usability (18 indicators)
- Resource identification and documentation (13 indicators)
- Author identification (9 indicators)
- Authority of author (5 indicators)
- Information structure and design (19 indicators)
- Relevance and scope of content (8 indicators)
- Validity of content (9 indicators)

- Accuracy and balance of content (8 indicators)
- Navigation within the document (12 indicators)
- Quality of links (13 indicators)
- Aesthetic and affective aspects (13 indicators)

Another approach for ensuring the quality of sites is the establishment of a Health on the Net Code of Conduct (HONcode) for medical and health websites [34]. This is a self-policing approach by which groups that wish to abide by the HONcode principles can display the HONcode logo on their site. The principles are summarized as follows:

- Health care advice provided by qualified professionals
- Site is intended to support (not replace) physician-visitor relationship
- Confidentiality respected
- Information referenced to source data
- Claims supported
- Information provided in the clearest manner, with e-mail support

If the principles are violated and not corrected, the HONcode symbol is removed. During the development of this paper, two other principles have been added, relating to disclosure of support and advertising.

Summary

In summary, there are many methods for the evaluation of website quality. These range from very general to a detailed shopping list. Though there are a few health-specific review sites and guidelines, they are not robust enough to meet the needs of the general public. Many methods value criteria not related to information quality, so that overall scores can be misleading. Moreover, though many of the general evaluation criteria can be used in the health arena, health websites provide information that can impact the well-being of the user. This makes the choice of appropriate indicators more challenging and crucial.

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Appendix D: Role of the Health Information Technology Institute

The Health Information Technology Institute (HITI) of Mitretek Systems is a nonprofit, 501(c)(3) organization whose mission is to use information technology to improve health. The Institute fulfills this mission by facilitating the development of standards, developing prototypes, conducting research, and providing information services in support of accessible, affordable, appropriate, and efficacious healthcare in the public interest. Since HITI is interested in using technology to maximize the health impact of resources on the Internet, the issue of the quality of Internet health information is critical to the Institute's mission.

The role HITI plays in the development of this document is one of coordination and facilitation. Some of the specific activities carried out to date and anticipated for the future are as follows:

- Identified the need for the document.
- Organized and selected the initial contributors.
- Planned, hosted, and conducted the Summit Meeting.
- Established an Internet chat room to support group communications.
- Coordinated the writing and external editing of the document.
- Posted and distributed the document.
- Will coordinate the joining of other groups in this effort.
- Is planning and will host the next two Summit Meetings.

Appendix E: Summary of Organizations

Agency for Healthcare Policy and Research
<http://www.ahrp.gov/>

American Association of Health Plans
<http://www.aahp.org/menus/index.cfm>

American Medical Association
<http://www.ama-assn.org/>

American Nurses Association
<http://www.ana.org/>

American Pharmaceutical Association
<http://www.aphanet.org/>

American Society of Health-System Pharmacists

The American Society of Health-System Pharmacists (ASHP) is the 30,000-member national professional association that represents pharmacists who practice in hospitals, health maintenance organizations, long-term care facilities, home care agencies, and other components of health care systems. The Society has extensive publishing and educational programs designed to help members improve their delivery of pharmaceutical care, and it is a national accrediting organization for pharmacy residency and pharmacy technician training programs.

The mission of the ASHP is to represent its members and to provide leadership that will enable pharmacists in organized health care settings to (1) extend pharmaceutical care focused on achieving positive patient outcomes through drug therapy; (2) provide services that foster the efficacy, safety, and cost-effectiveness of drug use; (3) contribute to programs and services that emphasize the health needs of the public and the prevention of disease; and (4) promote pharmacy as an essential component of the health care team.

<http://www.ashp.org/>

Association of Academic Health Sciences Libraries
<http://www.med.uc.edu/aahsl/>

Association of American Medical Colleges

The Association of American Medical Colleges represents all of the medical schools in the United States and Canada, and 400 teaching hospitals, including 75 Veterans Administration medical centers. We represent the interests of faculty, administration, students, residents, women, underrepresented minorities, and students making application to medical school. We administer the MCATs and American Medical College Admission System (AMCAS) and the electronic version, AMCAS-E. We are expanding our Electronic Residency Application System, "ERAS."

<http://www.aamc.org/>

Consumer Health Information Research Institute

Health Information Technology Institute
<http://www.mitrectek.org/hiti/>

Joint Commission on Accreditation of Healthcare Organizations

The Joint Commission on Accreditation of Health care Organizations is a private, not-for-profit organization dedicated to improving the quality of care provided to the public.

The Joint Commission is the nation's principal standard setter and evaluator for a variety of health care organizations, including hospitals, long-term care facilities, ambulatory health care organizations, behavioral health care organizations, home care agencies, laboratories, and health care networks. The Joint Commission accredits more than 15,000 health care organizations in the United States and its territories. This includes 80 percent of U.S. hospitals and more than 10,000 other health care organizations.

Since its founding in 1951, the Joint Commission has had once basic purpose: to improve the quality of care provided to the public through the provision of health care accreditation and related services that support performance improvement in health care organizations. In fulfilling that responsibility, the Joint Commission has become a world leader in developing accurate, meaningful ways to evaluate health care quality. Health care experts from around the globe come to the Joint Commission to learn how to develop comprehensive and objective systems for evaluation organizations. These new systems emphasize the use of performance-based standards as well as direct measures of performance.

The Joint Commission is governed by a Board of Commissioners composed of 21 appointees from its 5 member organizations (American College of Physicians, American College of Surgeons, American Dental association, American Hospital Association, and American Medical Association), 1 at-large nurse representative, and 6 public members.

In addition to its accreditation programs, the Joint Commission conducts education programs for accredited organizations and organizations considering or seeking accreditation; sponsors national and international conferences; participates in satellite video conferences; and publishes a wide range of books, videos, periodicals, and electronic products that explain and promote accreditation, performance measurement, assessment, and quality improvement in health care.

<http://www.jcaho.org>

Journal of the American Medical Association
<http://www.ama-assn.org/public/journals/jama/>

National Community Pharmacists Association

The National Community Pharmacists Association, formerly NARD (the National Association of Retail Druggists), serves the pharmacist owners, managers, and employees of nearly 35,000 independent community pharmacies across the country. Independent pharmacists—more than 75,000 nationwide—dispense the majority of the nation's retail prescription drugs.

<http://www.ncpanet.org/>

National Consumer's League

New York University, School of Social Work
<http://www.nyu.edu/socialwork/>

Office of Alternative Medicine, NIH
<http://www.nih.gov/>

Office of Disease Prevention and Health Promotion, HHS
<http://odphp.osophp.dhhs.gov/>

United States Pharmacopeia

The United States Pharmacopeia (USP), established in 1820, is a voluntary, not-for-profit organization comprising members from the health care professions and sciences representing academia, industry, and government. It fulfills its mission of promoting the public health by establishing and disseminating officially recognized standards of quality and authoritative information for the use of medicines and other health care technologies by health professionals, patients and consumers. The standards are published in the *United States Pharmacopeia* and the *National Formulary* and the drug-use information is provided in the *USP DI*®.

The standards published in the *United States Pharmacopeia (USP)* and the *National Formulary (NF)* contain standards of identity, strength, quality, purity, packaging, and labeling for more than 3,200 drug substances and products and are legally enforceable under various state and federal statutes.

The *USP DI* database contains comprehensive, clinically relevant, evidence-based drug information for health care professionals, patients and consumers. The *USP DI* is recognized for unlabeled uses, patient counseling, and drug utilization review in the Medicaid and Medicare provisions of the Omnibus Budget Reconciliation Acts (OBRA) of 1990 and 1993. It has similar recognition in a number of state laws as the basis for reimbursement of unlabeled uses of medications.

The USP also maintains the USP Practitioners' Reporting Network (USP PRN™). The USP PRN is a singular, nationwide network designed to serve reporting needs of health care professionals through four separate reporting programs, including the Medication Errors Reporting Program.

<http://www.usp.org/>

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Feedback Form

Name: _____

Title: _____

Association/Company: _____

Address: _____

Telephone: _____

Fax: _____

E-mail Address: _____

URL: _____

Evaluation based on the perspective of (check all that apply):

- Consumer of health information _____
- Webmaster _____
- Developer of Health Information _____
- Provider of products & services _____
- Librarian _____
- Academia _____
- Health Care Provider _____
- Editor _____
- Other _____

1. I suggest the following changes to improve the implementation of the criteria:

TABLE A-1: RANKING AND IMPLEMENTATION OF CRITERIA.

Importance (IMP) - reflects the importance of this criteria on assessing the quality of the information. 4 - Essential, 3 - Important, 2 - Desirable, 1 - Indifferent, 0 - Not at all. **Ease of Implementation (Ease)** - reflects how easy it will be to develop the criteria in a consumer useable way, 4 - very easy, 3 - moderately easy, 2 - minor difficulty, 1 - substantial difficulty, 0 - would not be able to do. **Ideas on how to implement this criteria** - how the criteria could be assessed by a consumer (e.g., under the criteria Credentials: Is the name of the author listed?(Yes/No) Are his/her credentials listed? (Yes/No)

Criterion	Ranking		How to Implement
	IMP (4-0)	Ease (4-0)	How to implement this criteria
Example: Credentials	4	3	<ul style="list-style-type: none"> • Is the name of the author listed? (Y/N) • Are his/her credentials listed? (Y/N) • How well do the credentials match the text? (5 – perfect match, 0 – not related)
C1 Credibility			
C1.1 Source			
C1.1a Source (e.g., organizational information)			
C1.1b Credentials			
C1.1.c Conflict of Interest			
C1.1d Bias			
C1.2 Context (e.g., advertising, medical condition)			

C1.3 Currency			
C1.4 Relevance/Utility			
C1.5 Editorial Review Process			
C2 Content			
C2.1 Accuracy			
C2.2 Hierarchy of Evidence			
C2.3 Original Source Stated			
C2.4 Disclaimer			
C2.5 Omissions Noted			
C3 Disclosure			
C3.1 Purpose of the site (e.g., promotional, educational)			
C3.2 Profiling (capture, sharing)			

C4 Links			
C4.1 Selection			
C4.2 Architecture			
C4.3 Content			
C4.4 Back Linkages and Descriptions			
C5 Design			
C5.1 Accessibility (e.g., can be used with low-end device)			
C5.2 Logical Organization			
C5.3 Internal Search Engine			
C6 Interactivity			
C6.1 Mechanism for Feedback			
C6.2 Chat Rooms (e.g., moderator present)			

C6.3 Tailoring (e.g., based on what algorithm, e.g., AHCPR)			
C7 Caveats (or others)			
C7.1 Alerts			

2. I suggest the following changes to the document:

Definitions

Bias - a systematic error that is unintentionally made.

Efficacy - under ideal conditions, describes the treatment effect.

Effectiveness - in “routine” practice describes the treatment effect.

Reliability - describes how reproducible the test results are.

Validity - describes how accurate a test is, or in other words, how truly the test measures what it is supposed to measure.

Randomized controlled trials - participants are assigned randomly to a study group (which received the intervention) or a control group (which receives standard treatment, no intervention or placebo). [35]

Cohort study - persons already exposed to the risk factor or intervention and controls who have not been exposed are selected by investigators to be followed longitudinally over time in an effort to observe differences in outcome. [35]

Case-control study - study and control groups are selected on the basis of if they have a disease (cases) and then investigated to determine how they are different. [35]