

Dermatology Resources on the Internet

Dean D. George, BS,* and Brent D. Wainwright, MD, MSME^{†,‡}

Both patients and medical professionals are increasingly accessing the Internet for health information. Today's Web enables features that facilitate information sharing in a social and collaborative manner, thus transforming the way we access data and communicate with our patients and colleagues. The visual nature of the field of dermatology lends itself to the use of the Internet for reference and educational purposes. To generate a list of Web sites commonly used by academic dermatologists, the authors polled the Accreditation Council for Graduate Medical Education Dermatology Program Directors for their top 3 Web resources. The purpose of this article is to identify resources used by dermatologists as well as patients and examine factors that can influence Internet search results. Concerns regarding professionalism in the era of social media are also explored. As the volume of health information on the Internet continues to increase, it is essential for physicians to be aware of what is available in cyberspace. Reference and learning tools for the physician, learning and support tools for the patient, and physician Internet presence are key aspects of modern dermatology practice.

Semin Cutan Med Surg 31:183-190 © 2012 Elsevier Inc. All rights reserved.

KEYWORDS dermatology, internet resources, social media

In the early days of computing, end users would send and receive data to and from colossal mainframes through monochromatic dumb terminals. With the advent of the microprocessor, what once filled an entire room became small enough for the desktop giving rise to the personal computer. Modern computers, tablets, and smartphones integrate both designs to maximize performance. Web browsing software and the Internet allow powerful mainframes with enormous data processing and storage capabilities to send refined data to the local microprocessor, enabling the rich customized multimedia experience end users enjoy today.

The Internet continues its ubiquitous expansion, recently exceeding 2 billion users worldwide.^{1,2} The number of Internet-based dermatology sites has similarly grown. An early review of Web-based dermatology resources in 1999 revealed > 500,000 sites indexed as dermatology resources.³

The same search presently reveals 20,400,000 hits,⁴ an increase of almost 4000%. Not only is the Internet more far-reaching, the ease with which we access data has improved. In North America, nearly 80% of the population has access to the World Wide Web.^{2,5} Smartphones, Wi-Fi enabled tablets, and increased network speeds have helped bolster Internet use.⁶

The World Wide Web is an information system built on the infrastructure of the Internet. It evolves like any technology and continues to transform the way we communicate and share information. The early Web was largely a text-based resource composed of static Web pages where users were content consumers.⁷ Today's Web enables features that facilitate information sharing, interoperability, and collaboration.⁸ This transforms the way users obtain information by allowing them to interact in a social and collaborative manner. As such, it impacts the way patients interact with other patients as well as physicians, with interesting implications in areas, such as research, marketing, and privacy.

Medical Information on the Internet

A myriad of Web sites providing medical information are presently available on the Internet. Both patients as well as medical professionals are accessing this vast digital resource. The availability of Internet-based health information influ-

*St George's University School of Medicine, Grenada.

†Department of Dermatology, New York University School of Medicine, New York, NY.

‡Dermatology Service, Department of Veterans Affairs Medical Center, New York, NY.

Conflict of Interest Disclosures. The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.

Correspondence Author: Brent D. Wainwright, MD, MSME, Department of Dermatology, New York University School of Medicine, 550 First Avenue, Room H-100, New York, NY 10016. E-mail: brent.wainwright@med.nyu.edu

ences patient's knowledge and expectations regarding health care and has undoubtedly changed the way health care professionals and patients acquire medical information.⁹

A study by the Pew Research Center in Washington, DC found that 83% of Internet users look online for health information.¹⁰ The visual nature of the field of dermatology lends itself to use of the Internet as a tool by which some patients may attempt self-diagnosis. Not surprisingly, more than half of WebMD's top 12 searches are related to dermatologic conditions. These include shingles, poison ivy, herpes, lupus, rash, ringworm, and yeast.¹¹

In terms of physician usage, market research firm Hall and Partners found 86% of physicians have used the Internet to gather health, medical, or prescription drug information.¹² A separate study in 2009 by Manhattan Research found 89% of physicians use the Internet for health-related research.¹³

Both physicians and patients are increasingly using these resources, but the sites they use are not mutually exclusive. The user profiles for an online dermatology atlas were examined by Gunther Eysenbach, MD, who found that although physicians and medical students use the information, just as many patients obtained access to the same data.¹⁴ As more medical journals allow open access, an increasing proportion of original research articles will be available to the public.¹⁵

Internet search engine Google is the most commonly used search tool with an estimated 900 million unique monthly visitors, making it the distant front runner in its category.¹⁶ Google search offers great utility because it is free, widely available, easy to use, and capable of indexing resources according to their relevance. This enables users to better navigate the enormous volume of material on the Internet. Nonetheless, the search function is not without limitation since public searches are limited to material that has open access and search results may not be from trusted sources.

The reliability of medical information is a concern for clinicians and patients alike. The sheer abundance of dermatology sites on the Internet is not in itself a representation of the utility of the material. Locating accurate information and assessing its quality is a task in itself, but an important consideration since anyone with access to the Internet can freely publish material without any sort of quality assurance or peer review.³

Methods by which to assess the quality of Internet-based information have been well described, with various quality control systems proposed to evaluate the quality of health information on the Internet. Specific quality criteria include accuracy, completeness, readability, design, disclosures, and references provided.¹⁷ These are not unlike the criteria proposed by Silberg,¹⁸ Wainwright,³ or Health on the Net code certification.¹⁹

The American Medical Association (AMA) has also developed and published guidelines concerning Web site content, online advertising and sponsorship, privacy rights, and secure means of e-commerce.²⁰ In addition to content, these guidelines are applicable to the present Internet and can be applied to electronic doctor-patient communication and blogs (privacy), online medical product sales (e-commerce), and address potential advertiser influence.

Table 1 Advantages and Disadvantages of Online Dermatology Educational Resources

Advantages	Disadvantages
Ease of use	Variable quality
Low cost	Potentially overabundant information
Extended access	Relevancy vs irrelevancy

As physicians, we should help direct patients to health information Web sites that provide information derived from reliable and credible sources and personally be familiar with the information patients can access.

Resources for Dermatologists

Dermatology resources on the Web are comprehensive and include, but are not limited to, journals, medication databases, image atlases, textbooks, educational audio and video, professional societies, and departmental and institutional Web pages. Online medical resources create a new concept in the paradigm of information management for our specialty. The unique features of electronic communication enables ready access to material relevant to dermatologists.²¹ Enhanced ability to access information and share expert opinion worldwide will help lessen inappropriate treatment or delayed referral to an appropriate specialist and facilitate the accurate diagnosis of various dermatologic diseases.³

The advantages and disadvantages of online dermatology educational resources were reviewed by Hanson et al.²² They have been modified and summarized in Table 1.

To generate a list of Web sites commonly used by academic dermatologists, the authors polled the Accreditation Council for Graduate Medical Education Dermatology Program Directors for their top 3 Web resources. The Freida Online search for dermatology residency yielded 114 programs. In doing this, we hope that readers may discover new resources that can benefit their practice.

Using these data, a group message was sent to program directors or their designee in January, with a follow-up request in February. Remaining nonresponders were contacted by phone in March. There was an overall response rate of 52.53%, and all responses were considered anonymous.

Rank order preference for the 3 Web resources was not specified in the survey request. Each listed resource in a program's response was awarded one point, with the aggregate data sorted by highest number of points. Because of the acquisition of eMedicine by Medscape, responses for either Web site were combined. Some programs responded with fewer than 3 resources.

Most programs identified Web sites with dermatology-specific reference materials, dermatologic publications and/or texts, and reputable medicine Web sites. The results are summarized in Table 2.

As one can see from the survey results, most sites used by academic dermatologists are well established and peer reviewed. Results were mainly comprised of medical references, search engines, and electronic versions of traditional

Table 2 Program Director Survey Results of Top Dermatology Web Resources

Points	Web site Name	Web site URL	Access	Description
33	PubMed	http://www.ncbi.nlm.nih.gov/pubmed/	Free	Citations for biomedical literature from MEDLINE, life science journals, and online books.
28	eMedicine/Medscape	http://emedicine.medscape.com/	Free with registration	Web resource for physicians and other health professionals featuring original peer-reviewed articles.
12	Expert Consult	http://www.expertconsultbook.com/	Book registration	Collection of best-selling reference titles across a wide range of medical and surgical specialties.
10	UpToDate	http://www.uptodate.com/	Subscription required	Evidence-based knowledge system authored by physicians.
9	JAAD	http://www.eblue.org/	Subscription for full access	Journal of the American Academy of Dermatology.
8	Google	http://www.google.com/	Free	The most frequently used search engine in the world.
6	DermNet New Zealand	http://dermnetnz.org/	Free	Authoritative facts about the skin from the New Zealand Dermatological Society.
5	AAD	http://www.aad.org/	Membership for full access	American Academy of Dermatology.
4	Google Scholar	http://scholar.google.com/	Free	Google search for scholarly literature.
4	Wikipedia	http://www.wikipedia.org/	Free	Multilingual, web-based, free-content encyclopedia project based on an openly editable model.
3	Archives of Dermatology	http://archderm.ama-assn.org/	Subscription for full access	Medical journal published by the American Medical Association.
3	Derm Atlas	http://dermatlas.med.jhmi.edu/	Free	A collection of 12,887 images in dermatology and skin disease.
3	Drugs.com	http://www.drugs.com/	Free	Drug information online.
3	Micromedex	http://www.micromedex.com/	Free	Evidence-based referential content for medication and disease management and patient education.
3	Visual Dx	http://www.visualdx.com/	Subscription required	Visual diagnostic decision support system that merges medical images and expert information.
2	American Board of Dermatology	http://www.abderm.org/	Free	Information about dermatology, residency training, certification requirements, etc.
2	Derm101	http://www.derm101.com/	Subscription for full access	Online resource library by Silverchair sponsored by Galderma.
2	Dermatology Online Journal	http://dermatology-s10.cdlib.org/	Free	Open-access, refereed publication intended to meet reference and education needs of international dermatology community.
2	Litt's DERM.	http://www.drugeruptiondata.com/	Subscription for full access	Profiles of generic and trade name drugs with references that link to PubMed.
2	Medline Plus	http://www.nlm.nih.gov/medlineplus/	Free	National Institutes of Health's Web site for patients and their families and friends.
2	Online Mendelian Inheritance in Man	http://www.ncbi.nlm.nih.gov/omim	Free	A comprehensive compendium of human genes and genetic phenotypes.
2	WebMD	http://www.webmd.com/	Free	Information regarding health and health care, including a symptom checklist and drug information.
1	ACGME	http://www.acgme.org/	Free	Accreditation Council for Graduate Medical Education.

Table 2 Continued

Points	Web site Name	Web site URL	Access	Description
1	British Association of Dermatologists	http://www.bad.org.uk/	Membership for full access	Information about the association and clinical guidelines with public information, including leaflets.
1	British Journal of Dermatology	http://www.brjdermatol.org	Subscription for full access	Electronic version of the popular monthly British periodical.
1	Dermatology Daily	http://aad.bulletinhealthcare.com/	Free	Daily eNewsBriefing summarizing key reporting in dermatology over preceding 24 h.
1	Dermatology Information System	http://dermis.net	Free	Comprehensive online dermatology Internet service for health care professionals and patients.
1	Dermatology Interest Group	http://derminterest.org/	Free	An informational local chapter Web site was submitted as a response.
1	Epocrates	http://www.epocrates.com/	Free	Online version of the popular mobile application.
1	International Dermoscopy Society	http://www.dermoscopy-ids.org/	Free Membership	Clinically oriented international organization promoting dermoscopy clinical research education.
1	JAMA	http://jama.ama-assn.org/	Subscription for full access	Highly regarded medical journal.
1	Journal of Investigative Dermatology	http://www.nature.com/jid/index.html	Subscription for full access	Publishes basic and clinical research in cutaneous biology and skin disease.
1	Logical Images	http://www.logicalimages.com/	Subscription for full access	Parent Web site of visual Dx and Skinsight with additional resources.
1	MD Consult	http://www.mdconsult.com/	Subscription required	Resource for In-depth and quick reference medical content.
1	New England Journal of Medicine	http://www.nejm.org/	Subscription for full access	Highly regarded medical journal.
1	Oncology Times	http://journals.lww.com/oncology-times/	Free for oncology clinicians	Web site for the newspaper that reports on breaking clinical news and practice management issues.
1	Ovid	http://www.ovid.com/	Free	Catalog of book, journal, and database resources with information search and discovery tools.
1	Physicians Desk Reference	http://www.pdr.net/	Free	The classic drug reference online.
1	Psoriasis.org	http://www.psoriasis.org/	Free	Official Web site of the National Psoriasis Foundation.
1	Skin and Allergy News	http://www.skinandallergynews.com/	Free	Web destination and multimedia properties of skin and allergy News.
1	Society for Investigative Dermatology	http://www.sidnet.org/	Membership for full access	Devoted to cutaneous investigation and promoting investigative dermatology.
1	Society for Pediatric Dermatology	http://www.pedsderm.net/	Subscription for full access	Online home of the only national organization dedicated to pediatric dermatology.
1	The Cochrane Collaboration	http://www.cochrane.org/	Subscription for full access	International network that creates reviews based on research evidence.

URL, unique record locator.

resources, such as journals and texts. Responses indicating resources from the American Academy of Dermatology totaled 15 points (*Journal of the American Academy of Dermatology*, *AAD*, and *Dermatology Daily*) but were kept separate to provide each Web site's unique record locator. It should be noted that some replies were from program chief residents

who identified materials that may be more relevant to board review and, similarly, from dermatologists seeking recertification.

In addition to Web sites, medical apps for smartphones and tablets are widely available presently. Popular titles include Medscape, UpToDate (subscription required), Micro-

Table 3 Private Practice 100 Patient Survey Results: 58 Patients Reported Using the INTERNET

Top Resources of Positive Respondents	
Google	32
WebMD	18
Mayo Clinic	2
Wikipedia	2
The "regular" Internet	2
PubMed	1
Triage (smartphone app)	1

medex, VisualDx (subscription required), Derm101 (subscription required), Epocrates, and Skyscape. Many peer-reviewed journals also have apps that allow subscribers to read content on mobile devices. Although not appearing in this survey, another study rated additional dermatology Web resources with video and audio content useful.²²

Resources for Patients

Patients are using the Internet for medical information in record numbers.¹⁰ When queried about their strategies for searching for health information, 82.5% of respondents said that they use "key words" with search engines.⁹

To gain some insight into the patient perspective, 100 patients (age range, 15-87) were surveyed in a private dermatology practice. Patients were asked whether they use the Internet to obtain information related to skin conditions. Affirmative respondents were then asked for their top Web resource. Patients were surveyed at both a suburban and an inner city location. Although not recorded, the patients polled were of varied ethnicity and socioeconomic status. The findings are summarized in Table 3.

Although the power of this survey is limited by its small sample size, it indicates that most patients prefer Google search (55%). Although some Internet resources regarding health information are subject to misinformation, dermatologic Web sites identified through Google search have been found to be relatively accurate and complete.²³ Moreover, sites, such as Wikipedia, have been found to be generally equal in accuracy and completeness to their traditional Web counterparts.²³

The second most common Web site in our survey was WebMD (31%), a site that has come under criticism for potential advertiser influence on its content.²⁴ The WebMD Health Network encompasses multiple WebMD-owned Web sites, including Medscape, eMedicine, MedicineNet, and other health-related sites, with 85 million unique monthly users during 2011.²⁵

Most patients feel the material they access online is accurate. In 1 study, > 98% of survey respondents reported that the Internet information they obtained was both understandable and trustworthy.⁹

Unfettered patient access to medical information on the Internet is transforming the patient-physician relationship and enhancing patient participation in the clinical decision-making process. As physicians, we should understand the

value of these resources to the patient, and recognize their ability to enable our patients to make more informed health care decisions.

Factors Influencing Search Results

It is important to understand the limitations of a particular search engine while looking for medical data. Additional factors may influence search results when using gateway portals, such as Google or Bing, the second most popular search engine with an estimated 165 million unique monthly visitors.¹⁶ Private content may not be accessible to the search engine, and each use proprietary algorithms which incorporate previous search history and location.^{26,27} Users should therefore be mindful that Google or Bing may display personalized search results based on Internet protocol address, browser cookies, or on the specific user if searching although logged in to a respective Google or Microsoft account.

Since most patients and many physicians initiate their medical search using major search engines, the authors performed a search for 5 common dermatologic conditions using the 2 most popular. The rationale behind this exercise was to demonstrate the variability of results based on search engine used. Using the Google AdWords Keyword Tool, 5 broad dermatologic terms with 1 million or greater user queries per month were selected.²⁸ On search engine results pages, top organic search positions earn the highest click-through rates,²⁹ and in 1 study, 92% of physicians clicked on the first result.¹² With this in mind, the top 5 results for each search engine were recorded for each term. To limit the influence of previous search history and location, the searches were performed using an Internet protocol address anonymizer³⁰ in a newly installed Firefox browser with cookies disabled. The results are listed in Table 4.

A couple of unexpected elements arose while searching. For a search that seemed to be about medical symptoms, Google algorithms analyzed search results to find health conditions that may be related to the symptoms in the query.³¹ In the search on rash, Google suggested contact dermatitis, seborrheic dermatitis, psoriasis, impetigo, and rosacea at the top of the search results page. On Bing, the top result for acne, herpes, warts, and melanoma was a link to Bing Health featuring content from MedlinePlus or MayoClinic instead of a direct link to the external resource.

The data show that identical search queries may return different results based on the search engine used. Most results displayed were from reputable sources. However, both search engines returned a few commercial Web sites selling products that were cleverly disguised as informational pages by their content and domain name. Perhaps, this is why more and more patients are using Yahoo! Health, NIH, WebMD, MedicineNet, and MayoClinic to access health information.³²

Social Media

In addition to its role as an "eLibrary," the Internet enables physicians to communicate and rapidly share information

Table 4 Top 5 Search Results for Acne, Rash, Herpes, Warts, and Melanoma on Google and Bing

Google	Bing
<p>Acne-9,140,000 global monthly searches http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001876/</p> <p>http://www.acne.org/*</p> <p>http://en.wikipedia.org/wiki/Acne_vulgaris</p> <p>http://www.acnestudios.com/†</p> <p>http://www.medicinenet.com/acne/article.htm</p>	<p>Acne http://www.bing.com/health/article/medlineplus-MPacne/Acne?q=acne&qpv=acne</p> <p>http://en.wikipedia.org/wiki/Acne_vulgaris</p> <p>http://www.acne.org/*</p> <p>http://www.acne.com/†</p> <p>http://www.medicinenet.com/acne/article.htm</p>
<p>Herpes –6,120,000 global monthly searches http://www.cdc.gov/std/herpes/</p> <p>http://www.cdc.gov/std/herpes/stdfact-herpes.htm</p> <p>http://en.wikipedia.org/wiki/Herpes_simplex</p> <p>http://www.webmd.com/genital-herpes/default.htm</p> <p>http://www.plannedparenthood.org/health-topics/stds-hiv-safer-sex/herpes-4271.htm</p>	<p>Herpes http://www.bing.com/health/article/mayo-MADS00179/Genital-herpes?q=herpes</p> <p>http://en.wikipedia.org/wiki/Herpes_simplex</p> <p>http://www.cdc.gov/std/herpes/STDFact-herpes.htm</p> <p>http://www.herpess.com/§</p> <p>http://www.cdc.gov/std/Herpes/</p>
<p>Rash –5,000,000 global monthly searches http://www.medicinenet.com/rash/article.htm</p> <p>http://en.wikipedia.org/wiki/Rash</p> <p>http://www.webmd.com/skin-problems-and-treatments/tc/rash-age-12-and-4-older-topic-overview</p> <p>http://www.webmd.com/skin-problems-and-treatments/guide/common-rashes</p> <p>http://www.nlm.nih.gov/medlineplus/ency/article/003220.htm</p>	<p>Rash http://www.medicinenet.com/rash/article.htm</p> <p>http://en.wikipedia.org/wiki/Rash</p> <p>http://www.answers.com/topic/rash</p> <p>http://www.webmd.com/skin-problems-and-treatments/tc/rash-age-12-and-older-topic-overview</p> <p>http://www.nlm.nih.gov/medlineplus/ency/article/003220.htm</p>
<p>Warts –1,830,000 global monthly searches http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001888/</p> <p>http://en.wikipedia.org/wiki/Wart</p> <p>http://www.medicinenet.com/warts_common_warts/article.htm</p> <p>http://www.webmd.com/skin-problems-and-treatments/tc/warts-and-plantar-warts-topic-overview</p> <p>http://kidshealth.org/parent/infections/skin/wart.html</p>	<p>Warts http://www.bing.com/health/article/medlineplus-MPwarts/Warts?q=warts</p> <p>http://en.wikipedia.org/wiki/Wart</p> <p>http://www.medicinenet.com/warts_common_warts/article.htm</p> <p>http://www.warts.org/¶</p> <p>http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001888/</p>
<p>Melanoma –1,000,000 global monthly searches http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001853/</p> <p>http://en.wikipedia.org/wiki/Melanoma</p> <p>http://www.skincancer.org/skin-cancer-information/melanoma</p> <p>http://www.melanoma.com/**</p> <p>http://www.mayoclinic.com/health/melanoma/DS00439</p>	<p>Melanoma http://www.bing.com/health/article/mayo-MADS00439/Melanoma?q=melanoma</p> <p>http://en.wikipedia.org/wiki/Melanoma</p> <p>http://www.melanoma.com/**</p> <p>http://www.cancer.gov/cancertopics/types/melanoma</p> <p>http://www.medicinenet.com/melanoma/article.htm</p>

*Acne treatment and community with a Store link selling products.

†Women's wear, men's wear, shoes, and accessories collection.

‡Informational site highlighting ProActiv products.

§Site of selling herbal and nutritional products.

¶Informational site maintained by the "Warts Information Center.

**Informational site geared toward patients by Schering, a subsidiary of Merck.

with millions of people. Social media allows the creation and exchange of content generated by the user,³³ which is transforming the way physicians communicate with the public. It is estimated that between 57% and 75% of US adults in their mid-20s and 30s are using social networking sites.³⁴ Social networks like Facebook, Twitter, LinkedIn, MySpace, Google+, and other forms of communication like YouTube are of such high popularity, that the use of this medium cannot be overlooked.

There are challenges and opportunities to efficiently make use of these social media tools. Their implementation among

physicians is nascent. Choosing the right medium for any given purpose depends on the target group to be reached and the message to be communicated. In addition to content dissemination, physicians and medical institutions are using social media as a marketing and advertising tool. In a 2010 study, 7 dermatology journals had a presence on Facebook and 3 had Twitter accounts.³⁵ The same article examined how dermatology practices used these resources and found links for patient education as well as promotional advertisement.

Physicians on Twitter often share information with the public. To gain insight into the use of Twitter by physicians,

5156 physician “tweets” were reviewed with a specific focus on professionalism. Analysis found 49% of tweets to be health related and 13% to be self-promoting. Only 3% were categorized as unprofessional, 0.7% represented potential patient privacy violations, 0.6% contained profanity, 0.3% included sexually explicit material, and 0.1% included discriminatory statements.³⁶ Clearly, the potential for conflicts of interest, unprofessional content, and patient privacy violations exists.

Despite these concerns, the use of social media by our profession is so important that Mayo Clinic established a Center for Social Media to assist health care providers in adopting social media tools.³⁷ In addition, the AMA has developed policy concerning professionalism in the use of social media. This policy addresses issues, such as patient privacy and professional boundaries, as well as the responsibility to report behavior that violates professional norms.³⁸

It is imperative that physicians assume an active role in the world of social media, regardless of their desire or lack thereof to be a content generator. The AMA suggests that physicians routinely monitor their own Internet presence to ensure the content posted about them by others is accurate and appropriate as it may have consequences for their medical careers.³⁸ Patients share experiences online that go beyond that of their health concern or experience with a particular treatment or medication and commonly include commentary on physician services. Sites, such as <http://HealthGrades.com>, <http://RateMDs.com>, <http://Vitals.com>, and <http://Yelp.com> not only enable patients to find doctors but also rate or review them. The site <http://ZocDoc.com> even offers online appointment booking.

Aside from popular social sites, such as Facebook and Twitter, there are many social networks online that are specifically designed for patients or health care professionals. These sites provide caring communities where patients can “meet” to share their experiences and provide support. One example is <http://PatientsLikeMe.com>, a social networking site where users can anonymously share treatment, symptoms, disease progression, and outcome data with the entire community.³⁹ The site offers a clinical trials matching tool that enables users to find research trials through <http://www.clinicaltrials.gov>.

One of the greatest advantages of using social media is the ability to communicate on a global scale. This has far-reaching implications in the areas of research, disease advocacy, and epidemiology.⁴⁰ It enables physicians from around the world to collaborate and share expertise. Along these lines, there are several social media sites with access restricted to health care professionals. Sites—such as <http://Sermo.com>, the largest online physician community in the United States—allow physicians to collaborate on difficult cases and exchange observations about drugs, devices, and clinical issues.⁴¹ <http://Ozmosis.org> is another online community, restricted to US-licensed and -verified physicians, that helps doctors engage with trusted colleagues in a secure environment.⁴²

Conclusions

The Internet transforms the way we access and assimilate medical information. As the volume of health information on the Internet continues to increase, it is essential for physicians to be aware of what is available in cyberspace. Reference and learning tools for the physician, learning and support tools for the patient, and physician Internet presence are key aspects of modern dermatology practice.

Social media facilitates the exchange of health information between patients and physicians and transforms the modern doctor–patient relationship. We should understand the value of information resources to the patient and learn to effectively use the Internet to improve communication with our patients. We can contribute to and enhance the availability of reliable information sources, thereby empowering our patients to make better health care decisions.

Unquestionably, the visual nature of the field of dermatology lends itself to the use of the Internet. Our enhanced ability to access the most current and relevant information and share expert opinion worldwide will help facilitate the accurate diagnosis of various dermatologic diseases. The ability to readily access information and share expert opinion benefits both physician and patient. Keeping up-to-date on various Web resources is part of the practice of modern medicine. With its constant expansion and widespread access, the Internet will continue to permeate almost every aspect of medicine and our lives.

References

1. The World Bank: Internet users. Available at: <http://data.worldbank.org/indicator/IT.NET.USER>. Accessed March 11, 2012
2. Internet World Stats: World internet usage and population statistics. Available at: <http://www.internetworldstats.com/stats.htm>. Accessed March 11, 2012
3. Wainwright BD: Clinically relevant dermatology resources and the internet: An introductory guide for practicing physicians. *Dermatol Online J* 5:8, 1999
4. Yahoo! Altavista. Available at: <http://www.altavista.com>. Accessed March 11, 2012
5. The World Bank: Internet users (per 100 people). Available at: <http://data.worldbank.org/indicator/IT.NET.USER.P2>. Accessed March 11, 2012
6. CISCO: Visual networking index. Available at: http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.html. Accessed March 11, 2012
7. Cormode G, Krishnamurthy B: Keys differences between Web 1.0 and Web 2.0. Available at: <http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/2125/1972>. Accessed March 11, 2012
8. Wikipedia: Web 2.0. Available at: http://en.wikipedia.org/wiki/Web_2.0. Accessed March 11, 2012
9. Schwartz KL, Roe T, Northrup J, et al: Family medicine patients' use of the Internet for health information: A MetroNet study. *J Am Board Fam Med* 19:39–45, 2006
10. Pew Research Center: Generations 2010. Available at: <http://pewinternet.org/Reports/2010/Generations-2010.aspx>. Accessed March 11, 2012
11. Web MD: Top twelve searches. Available at: <http://www.webmd.com/search/>. Accessed March 11, 2012
12. Hall & Partners Connecting with Physicians Online: Searching for Answers. Hall & Partners; New York: 2009. Available at: [http://www.fdashm.com/docs/Connecting with Physicians Online Webinar Deck–final.pdf](http://www.fdashm.com/docs/Connecting%20with%20Physicians%20Online%20Webinar%20Deck-%20final.pdf). <http://www.fdashm.com/docs/Connecting with Physicians Online Webinar Deck–final.pdf>. Accessed March 11, 2012

13. American Medical Association: AMedNews. Available at: <http://www.ama-assn.org/amednews/2010/01/04/bisc0104.htm>. Accessed March 12, 2012
14. Eysenbach G, Sa ER, Diepgen TL: Cybermedicine. Interview by clare thompson. *BMJ* 319:1294, 1999
15. UpToDate: Guide to health information resources for patients. Available at: <http://www.uptodate.com/contents/guide-to-health-information-resources-for-patients?view=print>. Accessed March 11, 2012
16. eBizMBA: Top 15 Most Popular Search Engines, 2012. Available at: <http://www.ebizmba.com/articles/search-engines>. Accessed March 11, 2012
17. Eysenbach G, Powell J, Kuss O, et al: Empirical studies assessing the quality of health information for consumers on the world wide web: A systematic review. *JAMA* 287:2691-2700, 2002
18. Silberg WM, Lundberg GD, Musacchio RA: Assessing, controlling, and assuring the quality of medical information on the Internet: Caveant lector et viewor—Let the reader and viewer beware. *JAMA* 277:1244-1245, 1997
19. Health on the Net Foundation: The Hon Code. Available at: <http://www.hon.ch/HONcode/>. Accessed March 11, 2012
20. Winker MA, Flanagan A, Chi-Lum B, et al: Guidelines for medical and health information sites on the internet: Principles governing AMA web sites. American Medical Association. *JAMA* 283:1600-1606, 2000
21. Cassian Sitaru MD: Dermatology resources on the internet: A practical guide for dermatologists. *Int J Dermatol* 38:797-798, 1999
22. Hanson AH, Krause LK, Simmons RN, et al: Dermatology education and the internet: Traditional and cutting-edge resources. *J Am Acad Dermatol* 65:836-842, 2011
23. Jensen JD, Dunnick CA, Arbuckle HA, et al: Dermatology information on the internet: An appraisal by dermatologists and dermatology residents. *J Am Acad Dermatol* 63:1101-1103, 2010
24. Heffernan V: Online medical advice can be a prescription for fear. Available at: <http://www.nytimes.com/2011/02/06/magazine/06FOB-Medium-t.html>. Accessed March 11, 2012
25. WebMD: Annual report, 2011. Available at: <http://investor.shareholder.com/common/download/sec.cfm?companyid=WBMD&fid=1193125-12-88803&cik=1326583>. Accessed March 11, 2012
26. Google: Technology overview. Available at: <http://www.google.com/about/corporate/company/tech.html>. Accessed March 11, 2012
27. Bing B: Privacy supplement. Available at: <http://privacy.microsoft.com/en-us/bing.mspx>. Accessed March 11, 2012
28. Google: Google AdWords keyword tool. Available at: https://adwords.google.com/o/Targeting/Explorer?__c=1000000000&__u=1000000000&__o=kt&ideaRequestType=KEYWORD_IDEAS. Accessed March 11, 2012
29. Search Engine Watch: Top google results get 36.4% of clicks. Available at: <http://searchenginewatch.com/article/2049695/Top-Google-Result-Gets-36.4-of-Clicks-Study>. Accessed March 11, 2012
30. Online Anonymizer. Available at: <http://www.onlineanonymizer.com>. Accessed March 11, 2012
31. Google: Symptom search. Available at: http://support.google.com/websearch/bin/answer.py?hl=en&pg=g_symp&answer=2364942. Accessed March 10, 2012
32. eBizMBA: The 15 Most Popular Health Web sites, 2012. Available at: <http://www.ebizmba.com/articles/health-websites>. Accessed March 11, 2012
33. Kaplan AM, Haenlein M: Users of the world, unite! The challenges and opportunities of social Media. *Bus Horiz* 53:59-68, 2010
34. Chretien KC, Greysen SR, Chretien JP, et al: Online posting of unprofessional content by medical students. *JAMA* 302:1309-1315, 2009
35. Hay AA, Gamble RG, Huff LS, et al: Internet social networking sites and the future of dermatology journals: Promises and perils. *J Am Acad Dermatol* 65:e81-e83, 2011
36. Chretien KC, Azar J, Kind T: Physicians on Twitter. *JAMA* 305:566-568, 2011
37. Mayo Clinic: Center for Social, Media: Background. Available at: <http://socialmedia.mayoclinic.org/about-3/home/>. Accessed March 11, 2012
38. AMA: Policy: Professionalism in the use of social media. Available at: <http://www.ama-assn.org/ama/pub/meeting/professionalism-social-media.shtml>. Accessed March 11, 2012
39. Anonymous: Calling all patients. *Nat Biotechnol* 26:953, 2008
40. Parsons M: The impact of social media on medicine: Expanding the scope of treatment: Harvard College Global Health Review. Available at: <http://www.hcs.harvard.edu/hghr/2012/02/01/the-impact-of-social-media-on-medicine-expanding-the-scope-of-treatment/>. Accessed March 11, 2012
41. Sermo: Get to know Sermo. Available at: <http://www.sermo.com/about/introduction>. Accessed March 11, 2012
42. Ozmosis A. Available at: <https://ozmosis.org/about>. Accessed March 11, 2012