Advances in Psychiatric Treatment (2003), vol. 9, 387–396

Emerging challenges in using health information from the internet

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Abstract In 2000, about 350 million adults used the internet and people increasingly take articles from websites to medical appointments. The quality and safety of websites vary widely and some users are reluctant to access mainstream sites. People are vulnerable to misinformation and exploitation: there is evidence that online purchases have caused morbidity and mortality. This paper reviews the current evidence on the dissemination of health information on the internet and the various strategies that are developing to assess and screen site quality. Such strategies include 'quality assurance' marking, specially designed search engines, and operational criteria for individuals to apply to sites. It also discusses the medical community's roles and responsibilities in relation to this burgeoning area.

For people living in the cities of Britain it is now almost easier to connect to the internet than it is to find a bookseller or a library. Cyber cafés and the affordability of home computers and internet access make connecting to the web simple. Government promotion of broadband access can only increase the numbers using the internet. Additionally, the immediacy of the internet and its interactive nature make it a compelling source of information (Eysenbach, 1998). Lay people looking for health information can be online in minutes, at any time and from the comfort of their own homes – a situation in stark contrast to a visit to casualty or even to a busy general practice.

Furthermore, the internet promises a means of obtaining up-to-date information often not otherwise available, both in developed and (perhaps particularly importantly) in developing countries. At the end of 2000, about 350 million adults were using the internet (Ipsos-Reid, 2001). Eaton (2002) cites figures from Datamonitor reporting that one third of Europeans and almost half of Americans use the internet for health information.

Since the early days of internet use, it has been noticeable that mainstream providers of health care information are often initially slow to develop sites, whereas independent organisations and individuals are quick to offer health care information and products of varying degrees of quality, honesty and safety. This situation is sometimes compounded by the fact that health care users may feel alienated by official sites, either because they are wary of the motives of mainstream medicine or because they are searching for information that will be easier to read. It is interesting to note that published criteria addressing the issue of quality do not always include readability, although more recent papers are now addressing this. For example, Croft & Peterson (2002) used the criterion of accessibility to evaluate the quality of asthma education on the internet, and included in this items such as readability, language and download time.

In addition, some individuals actively search for information about complementary medicine, either because of adverse experiences with mainstream medicine or in desperation for cure. This may be an alternative to discussing complementary medicine with health care practitioners, whom they suspect may disapprove. Such people can be very vulnerable to claims made on unscrupulous sites.

The unpredictable nature of gathering information on the internet is further complicated by the fact that different search engines produce very different results for the same search terms, and subtle variations in wording can produce dramatically different findings. It is therefore hard to predict what a user will find.

Additionally, the process by which sites are ranked within search results is a complex one, based on the

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Box 1 Factors influencing lay people's access to websites

- The identification and ranking of websites on internet searches is influenced by complex factors that do not necessarily include the quality of the site
- There can be many reasons why users prefer to use the internet to gain access to medical information – these include its immediate availability and non-judgemental quality
- 'Non-official' sites may be just as influential (and more readable) than 'official' sites

ease with which the site can be categorised (a process that can be influenced by the search engine used), the site's popularity, the number of other sites that link to it and how many search engines it is listed with. It is easy to see that this process can be manipulated, and that the inherent quality of the site is not always reflected in its ranking or availability on searches. This information is summarised in Box 1.

Rationalising information retrieval

To understand the progress that is being made in rationalising the information available on the internet, it is necessary to understand the difference between the internet and the World Wide Web. The internet can be described as a 'network of networks' linking computers around the world. Thus, it refers to the computers, the connections and the rules and addresses that define how the information is sent from one place to another.

The early research into computer networks was carried out by the US Ministry of Defense and made public in 1972. In 1989 Tim Berners-Lee began working on an easier way to retrieve research documentation. He developed a coding system known as hypertext mark-up language (HTML), which is now used by web-content creators to produce links to other sites. He also designed an addressing system that allocated a unique location to each web page, and created a set of rules that permitted documents to be linked together on computers across the internet. These rules he called the hypertext transfer protocol (HTTP). Finally, he created the first browser, which was called the World Wide Web. This allowed users anywhere in the world to view his work on their computer screen. It gave a new order to the internet and led to an explosion in its growth.

A theme that will be picked up later in this paper is the potential impact of the work by Berners-Lee and his colleagues at W3C (the World Wide Web Consortium) on the 'Semantic Web'. The Semantic Web aims to increase the cohesiveness of the web by standardising the coding languages used. This would make computer languages easier for machines to understand, both because they would all use the same coding and because the coding itself would follow a standard structure (at present the coding of some websites cannot be understood by either humans or computers). This can be a problem, for example when a human is programming a search engine for specific results.

Unwanted effects of internet information?

Sieving (1999) reports that when the US National Library of Medicine became freely accessible to the general public the number of Medline searches increased from 7 million in 1996 to 120 million in 1997. However, as mentioned above, many people are wary of mainstream medical sites and find instead sites designed by users for users with a particular condition. These can be balanced and useful sources of knowledge. Unfortunately, these are not the only sites that a user may find, and a review of the literature reveals the emergence of several potentially dangerous themes in sites (Box 2).

The growing number of pages on the internet (a survey of web servers received responses from 35 686 907 sites in November 2002 (Netcraft, 2002))

Box 2 Is online information safe?

The following are among the issues that raise concern:

- Potentially dangerous drugs and other substances may be bought by individuals for themselves or their children
- Individuals can spend a lot of money on products or diagnostic procedures that have no scientific backing and no benefit
- The information may be more negative than the reality of the situation
- Individuals may abandon treatment programmes of proven efficacy to pursue less-mainstream approaches
- Users' sites (e.g. for families affected by autism) may contain advice or opinions of questionable ethics (e.g. non-mainstream treatments that are intrusive or punitive)

makes it very difficult to regulate. This problem is compounded by the fact that the sites available are forever changing. Attempts to trace non-health-related sites involved in illegal sales have proven to be difficult and time-consuming. The *Guardian* recently published an article (Clayton, 2002) about a company named Brand Intelligence, which is used by businesses to monitor the way in which their names are being used online. The article highlighted the fact that professional-looking websites offering online sales facilities can appear and disappear without a trace in a matter of hours.

Guiding the perplexed searcher

The fact that each country is governed by its own laws makes it very difficult to provide legislation to protect the public. A potentially important recent ruling reported on in the British press (Gibson, 2002) found against *Barron's*, the New Jersey-based magazine published online by Dow Jones. The magazine had published material on its website, apparently intended for a New Jersey audience only, about a person in Australia. The Australian High Court ruled that the magazine could be prosecuted under Australian law for allegedly defamatory material.

Quality initiatives

In the absence of clear universal legislation, different quality initiatives have been developed to guide the user seeking online knowledge. As Risk & Dzenowagis (2001) explain 'all sets of criteria derive from very similar roots ... these roots are the principles of honesty, privacy, confidentiality, accuracy, currency, provenance, consent, disclosure and accountability'.

Generally speaking, these initiatives fall into the following six categories (the web addresses of the organisations mentioned within these categories are given in Table 1).

Recommended principles

Websites can use these to ensure that they are behaving in an ethical fashion. Examples include the eHealth Code of Ethics and American Medical Association Guidelines.

The eHealth Code of Ethics This was produced by the Internet Healthcare Coalition, which began as a response to issues raised initially by the Food and Drug Administration in 1996. It is now a globally recognised body which has guidance on its websites for people seeking health care information on the

Table 1 Available quality initiatives

Initiative	*Web address*	*Comments*
eHealth Code of Ethics	http://www.ihealthcoalition.org	Principles to provide ethical guidance for websites
American Medical Association Guidelines	http://jama.ama-assn.org/issues/v283n12/ffull/jsc00054.html	Principles to provide ethical guidance for websites
American Accreditation Healthcare Commission (URAC)	http://webapps.urac.org/websiteaccreditation/default.htm	Website trustmarks that indicate that sites meet with standards of quality and ethics
Health Internet Ethics (Hi-Ethics)	http://www.hiethics.com	Website trustmarks that indicate that sites meet with standards of quality and ethics
Health on the Net Foundation	http://www.hon.ch//HONcode/Conduct.html	Website trustmarks that indicate that sites meet with standards of quality and ethics
Omni	http://omni.ac.uk/	Medical search engines that look for high-quality information
Discern	http://www.discern.org.uk	Evaluation criteria available for any website
Tool developed by Mitretek	http://hitiweb.mitretek.org/iq/	Evaluation criteria available for any website
Certification and Rating of Trustworthy and Assessed Health Information on the Net (MedCERTAIN)	http://www.medcertain.org/	In development to provide a quality seal and a search engine

internet. It is a not-for-profit body. American Medical Association Guidelines (Winker *et al*, 2000) are the principles governing the Association's websites, which other organisations can adopt or use as the basis for their own guidelines.

Trustmarks

Websites can display 'trustmarks' to indicate that their sites meet acknowledged standards of quality and ethics. Among the bodies offering trustmark accreditation are the American Accreditation Healthcare Commission (URAC), Health Internet Ethics (Hi-Ethics) and the Health on the Net (HON) Foundation.

URAC This is a not-for-profit organisation whose accreditation criteria are based on the principles summarised by Risk & Dzenowagis (2001). Websites applying for accreditation are reviewed first by a member of the URAC accreditation staff and then by its Accreditation Committee and Executive Committee. There is a fee (in 2002, roughly US $2000 to US $5000) for this process. Accredited sites that subsequently display non-compliance with the guidelines can have accreditation withdrawn.

Hi-Ethics This not-for-profit organisation also bases its accreditation criteria on the principles summarised by Risk & Dzenowagis. Its accreditation is currently carried out by URAC. Sites that subsequently display non-compliance with the guidelines can have accreditation withdrawn.

HON The Health on the Net Foundation was set up in 1995 after a conference on the internet. The HON Code was launched in 1996. Once again it is not-for-profit and its accreditation criteria are based on the principles summarised by Risk & Dzenowagis. The Foundation also has two medical search engines. The HON Code differs from the two accreditation systems mentioned above in that it is a self-certification system. Sites that conform to its eight basic ethical standards can choose to display its logo, which acts as an active link to the HON site to ensure authenticity. However, HON does review all sites that apply for membership and if sites do not conform, the link connecting their HON logo to the HON site can be broken. The fact that sites do not have to pay to use this certification system can be an advantage for smaller sites.

Dedicated medical search engines

Search engines can be programmed to look for high-quality information. One such engine for medical searches is Omni, which reviews information in health sites. People searching with this engine receive addresses of quality assured sites. Omni monitors sites and frequently searches the internet for new sites. Omni is a gateway within the Biome service, which provides equivalent services for other sciences. Although this portal is aimed at 'students, researchers, academics and practitioners', other people are free to use this service.

Explicit evaluation criteria

There are also evaluation tools that users can apply to a website, in order to draw their own conclusions about its status. These include Discern and the Mitretek evaluation tool.

Discern This tool was initially developed to assess the quality of printed written information, but it is now available for internet sites as well. It has been devised by a panel of experts from a broad clinical and professional base. People take a copy of the tool to sites they wish to evaluate. This procedure can be time-consuming and is subjective.

Mitretek The tool developed by a panel of experts at Mitretek also provides a system for assessing the quality of websites. People using the tool on a particular site complete a questionnaire and arrive at a quality score. This tool is no longer funded by Mitretek nor is it supported or maintained by any other organisation. Although it is not clear whether or not it is in use it can be viewed at the web address shown in Table 1.

Certification and Rating of Trustworthy and Assessed Health Information on the Net

Known by the acronym MedCERTAIN, this is a project funded by the European Union as a part of the Action Plan on Promoting Safer Use of the Internet by Combating Illegal and Harmful Content on Global Networks.

A system is currently being developed that will provide both a quality seal and a search engine to search for sites that have a recognised quality rating. It makes use of file metadata – the data about data contained in each file on a computer – standard vocabulary about quality, and content filtering labels (Risk & Dzenowagis, 2001). It aims to establish software for systems of both self- and third-party rating that will identify and select high-quality information. The self-rating system is for those who set up websites and post documents, and the third-party system is for individuals who use or recommend that information. Thus, it can be seen to be working towards the same end as the Semantic Web mentioned above. Additionally, MedCERTAIN aims to actively encourage information providers to conform to guidelines on ethical content and take a part in consumer education.

.health: a new domain

In 2000, the World Health Organization (WHO) put forward the suggestion that a new domain, called .health, be set up which could be used by approved health sites (Illman, 2000). The Internet Corporation for Assigned Names and Numbers (ICANN) rejected this proposal, on the basis that it would be very difficult to police sites and also that it would give the WHO immense control over health information. ICANN reconsidered the proposal in 2002, but again rejected it. The WHO has now proposed that ICANN should ‘set out a clear timetable for agreeing new domain names after rejecting a proposed health domain’ (Brown, 2002).

Recent literature

There has been rapid recent development in the medical literature on the subject of quality and internet regulation and the related area of the impact of the internet on patients and professionals. In 1996 a paper appeared by Mayer & Till with the title ‘The internet: a modern Pandora’s box?’ In the same year the *BMJ*’s News section contained reports on the growth of unverified health claims on the internet (Bower, 1996), on investigations into the sales of prescription drugs in both England and France (Dorozynski, 1996; Dyer, 1996) and on 15 deaths in the USA as a result of a herbal stimulant (Josefson, 1996). In addition, an article had appeared on the ethics of online psychotherapy posing the dilemma of what to do about a patient who is voicing suicidal ideation (Lloyd *et al*, 1996).

By 1997, a range of papers had been published. Gomez (1997) discussed the need to assess cancer information on the internet. Wootton (1997) looked at information on women’s health and observed: ‘Most arguments in favour of regulating and restricting the information that is accessible to patients underestimate the power of the new health care consumers and fail to distinguish between quality of information and quality of knowledge.’ This is an observation that articles still echo. Davison (1997) reviewed 167 websites giving dietary information and found that 76 (45%) of these provided information that was not consistent with one or more of the recommendations made in Canadian national guidelines on nutrition, and included information that was essentially advertising. Impicciatore *et al* (1997) found that only 4 out of 41 web pages offering parenting information adhered closely to the main recommendations of clinical guidelines for managing fever in children set out by El-Rahdi & Carroll (1994).

In 1998, Jadad & Gagliardi published the first systematic review of the instruments available for evaluating health information on the internet. They found 47 such rating instruments. Fourteen of these provided a description of the criteria used to produce the ratings, but only 5 of the 14 provided instructions for their use. None of these 5 had been validated. This called into question the reliability of the very sites supposedly providing information on reliability.

Regulation and quality assessment

To regulate or not to regulate?

There have been many calls for regulation of the internet. Armstrong *et al* (1999) reported on the direct sale of sildenafil to patients from the internet, and the American Medical Association has urged for a regulation of internet prescribing (Carnall, 1999). Additionally, the WHO has called for tighter controls on the internet, particularly in relation to the sale of prescription drugs. A balancing view was put forward by Smith (2001), who cited a systematic review by Crocco of medical reports on five databases, including Medline and EMBASE, which found only one case in which a patient had died as a result of drugs ordered over the internet. Letters of response to this article, however, were quick to provide more examples of the internet harming health. In contrast, Eysenbach (1998) pointed out that it would be unrealistic and undesirable to attempt to control information on the internet.

Emergence of quality review tools

Alternatives to regulation of the internet have also been put forward. Eysenbach (1998), for example, suggested that independent third parties should evaluate sites and that sites carry electronic labels locatable by search engines. This would allow users to specify clearly the information they want, and is one of the principles incorporated in the MedCERTAIN project.

By 1999 there were further proposals for methods of searching for sites with certain markers of quality (Price & Hersh, 1999), for helping patients to develop self-assessment methods for reviewing the information they find (Jones, 1999) and for the use of indirect quality indicators to help assess quality. Hernández-Borges *et al* (1999) used this method and concluded that ‘some website characteristics such as the number of daily visits, their updating frequency and, overall, the number of websites linked to them, correlate with their evaluation by some of the largest rating systems on the internet’. Finally, Kim *et al* (1999) reviewed the criteria being used to assess sites and concluded that authors agreed on many key criteria and that there was a need to reach a consensus on these findings and disseminate them in a form that the general public could understand.

The *BMJ* explored the issue of online health in a special edition in March 2002, reporting that a government-funded body in The Netherlands had launched its own trustmark (Sheldon, 2002) and that Gagliardi & Jadad (2002), in a follow up to their study of quality ratings (Jadad & Gagliardi, 1998) found that 'many incompletely developed rating instruments continue to appear on websites providing health information, even when the organisations that give rise to those instruments no longer exist'.

Wilson (2002) reviewed the quality of available rating scales and concluded that quality remained a subjective assessment and that applying tools to a website is a time-consuming exercise that users might be reluctant to undertake. Wilson's article argued against developing yet more tools, suggesting instead that users would in time develop the skills to assess the internet effectively, just as they acquire skills to assess written information. As mentioned above, the WHO once more argued (unsuccessfully) for the creation of a domain name, .health, to help guide users to reliable information (Brown, 2002).

Two other studies in 2002, by Eysenbach *et al* and Craigie *et al*, respectively concluded that the subjective method of reviewing specific information with unvalidated tools is a potential source of misinformation, and that a panel of five experts who reviewed online information had a low level of agreement. This indicated the clear need for interrater reliability in research assessing the accuracy and quality of information on the internet.

Is 'trustmarking' acceptable and possible?

It might be argued that the very people who are most likely to seek information from sites that do not seem alienatingly 'official' would be put off by the quality measures suggested above. Some sites are created by individuals who are independent of organisations that might oversee the safety and quality of their contents. Such sites might be particularly likely to contain dangerous or misleading health care claims, but unless they have obtained an official 'quality seal' they have been largely unexplored by medical researchers. These independent sites could add another layer to the debate. There are also many sites run by organisations such as charities, addressing specific health issues (e.g. drug or alcohol use). Papers have been published that make recommendations about sites, but these too are largely unexplored and unconsidered.

Ethical and legal themes in the provision and study of health care resources

Hi-Ethics, a consortium of large commercial web companies, was established in 2000 to generate guidelines in the areas of trust, privacy, confidentiality, editorial integrity and advertising policies. Terry (2000) addressed the important subject of the legal implications of being a trustmark authority (e.g. in relation to sites that complain about negative ratings, or people suffering injuries resultant from information on sites with positive ratings) and once again recognised the need for legislation in this area. It is interesting to note WHO's plan to establish the .health domain to guide internet users was first rejected in 2000.

As can be seen, each passing year brings new contributions to the internet debate and further dimensions to be debated. In 2000 Childress explored the ethical responsibilities of provision of online psychotherapy. He pointed out that if there is a demand for the service then people will try to fill it and that it is important they do so ethically. He also explored the important themes of minimising misunderstanding in text-based therapy and maximising confidentiality. It is interesting to note that in 2001, Philip Hodson issued a press release on behalf of the British Association for Counselling and Psychotherapy which offered guidelines about using online therapists (Hodson, 2001). Eysenbach & Till (2001) explored the ethical issues involved in doing qualitative research on the internet, raising the important point that the privacy of online communities might be violated, as might the confidentiality of users of the site.

The internet contains many examples of online communities; these include mailing lists, bulletin boards and online newsgroups. These forums are used for discussion, information exchange, socialising and giving and receiving support, and they can cover very sensitive issues (Sixsmith & Murray, 2001). The fact that these sites are freely available in the public domain has led to debate about studying them. Sixsmith & Murray outline the ethical considerations of viewing what online communities have written, pointing out that they can be a way of hearing the voices of people not usually represented in research, and also that such study raises issues of consent. It has been argued that researchers are 'only participating in the electronic equivalent of hanging-out on street corners … where they would never think of wearing large signs identifying themselves as "Researcher"' (Garton, 1997). However, Garton too spoke of the importance of respecting the privacy of the participants, to ensure

Box 3 The influence of the internet in the consulting room

Patients' easy access to the internet can have repercussions in the consulting room. For example:

- the patient or family may be better informed than the doctor about medical findings in a very specialised area
- patients and families may have found upsetting prognostic information on a little researched condition, but this might not in fact apply to their situation
- patients may have paid money to obtain a 'diagnosis' from a website that uses methods not condoned by mainstream medicine
- patients can discover information about a treatment that cannot be financed by the NHS

that they do not lose trust in the very forums that may be providing them with important support.

It is interesting to note that while the psychology community has considered internet ethics almost exclusively in terms of the moral considerations involved in studying online activities, medicine has tended much more to consider the ethical concerns involved in the provision and regulation of online health care.

The role of medicine in relation to internet information

The current consensus in our society seems to be that people want the medical profession not to make their decisions but to provide a forum for a process of joint informed decision-making. Consequently, the profession needs to consider carefully the stance it takes on the internet.

The fact that patients are increasingly bringing internet information into the consulting room raises many interesting issues. Some of the knowledge they find may be detrimental to the consultation (Box 3), but the very fact that patients are using the internet may drive doctors to do the same, thus enhancing practice and perhaps enabling doctors to become involved in 'policing' some of the more dangerous sites.

In the absence of clear guidance about the role of medicine in relation to the internet, several themes emerge. First, there is a need for more widespread debate through the medical Royal Colleges and the British Medical Association. Second, the undergraduate syllabus should include more teaching on online information available to patients. Finally, and perhaps most importantly, doctors must be aware of the online patient information in their specialist area. This task could be undertaken jointly by a group of clinicians and in this way could once again involve the medical Royal Colleges.

Recommendations

For clinicians wishing to assess sites brought to their attention by patients or that might be a good source of information for their patients, the most useful guidelines are probably the ones provided by the American Medical Association (AMA) for its websites (Winker *et al*, 2000). The AMA guidelines (summarised in Box 4) provide principles governing content, advertising and sponsorship.

Principles for content cover, among other things, definition of website content, site ownership, site viewing, funding and sponsorship, quality of editorial content, review, date of posting, revising and updating, sources of editorial content, linking, intersite navigation, downloading of files and navigation of content.

Principles for advertising and sponsorship include the prohibition of advertising on the same page as editorial comment on the same topic; the option to skip over an advertisement; the need for advertising to be readily distinguishable from editorial content; and the need for links to advertising sites to be clearly marked and to show sponsorship details, both on the home page and on the pages on which the links appear: it should be very obvious when a user will be transferred to such an advertising site.

Box 4 Guidelines for doctors assessing a website for use by patients

The following guidelines are based on the American Medical Association Guidelines (see Table 1 for internet address) and evidence-based medicine

Content Check the site's ownership, quality of editorial content, date of posting and updating, sources of editorial content

Advertising and sponsorship Advertising should not be on the same page as information about the same topic; it should be obvious when links take users to an advertising site; sponsorship should be clearly displayed on the home page

Information Is this factually correct? Does it meet with available guidelines (e.g. NICE)? Do you think your patients would be able to understand it?

In addition to these principles, doctors should apply their medical knowledge to the quality of the information provided, i.e. its factual correctness and whether or not it meets with available guidelines such as those published by the National Institute for Clinical Excellence (NICE). There are no universally recognised guidelines covering the accessibility of the information and the best tool is probably an awareness of the issue itself.

There are no clear universal regulations governing health care information, and several different approaches are available:

(a) recommended principles that sites can use to govern their own behaviour;
(b) the trustmarks that sites display (these are, of course, only as reliable as the sites that create them);
(c) medical search engines that seek up-to-date, high-quality sites (again, the value of the selection depends on the people undertaking it);
(d) evaluation criteria that users can apply to sites; these can be time-consuming and they cannot directly evaluate the accuracy of medical information.

There are moves to provide more effective measures, but none is yet available.

At present, many of the articles about the internet are read in paper, not electronic, form. Perhaps there is a case to be made for ‘offline’ education of patients and clinicians about online health care information available for the general public. Practical ways of tackling this include leaflets and posters in general practices or advertising in the national media. Such public education will need to take into account the possibility that anxiety about the internet may partly be a generational issue. For children who grow up e-mailing their favourite Saturday morning TV presenter, some of the skills necessary to discern good or bad online information will spontaneously become increasingly well developed – just as previous generations learned which teen magazines to trust.

Conclusions

The internet was initially created to meet the US Ministry of Defense’s need to be able to communicate in a way that was flexible and decentralised. The advent of the World Wide Web helped to rationalise the available information. The very flexibility and lack of a controlling structure that has allowed the internet to expand so successfully and to provide a forum for free speech has also made it impossible to regulate. To impose a rigid set of rules on the internet would alter its very nature. Additionally, as health care clinicians we have neither a clear role nor an obligation in ensuring the quality of health care websites. However, as patients are increasingly bringing information from the internet into our consulting rooms this is becoming an issue that we cannot postpone addressing.

It may well be that the current success of the internet is in no small part due to the fact that using it enables people to enhance their sense of autonomy. One of the key roles and privileges of the medical professional in the past was to embody and wholly regulate a base of health-related knowledge. Those days have gone (and, of course, were not uncontested even then). We live in a society of increasingly widely disseminated knowledge and plural sources of authority. Doctors will continue to have a key place in the health knowledge arena, but will need increasingly to share the ring within wider knowledge debates. The public wishes to use its own decision-making abilities and, when worried, is highly motivated to search the field.

It is paradoxical to think that, just as the wider health debate is spiralling into plurality in this way, our own professional knowledge base is becoming ever more tightly regulated, evidence-based and convergent. Perhaps it is just this paradox that contains the seeds of the future and our own role in it. As we tend less and less to ensure the reliability of information by putting trust in an individual who embodies respect, we find that we need increasingly rigorous and transparent external procedures for knowledge validation. In so far as it is successful, this effort to construct and maintain an objective evidence base is bound in time to become increasingly the gold standard for the wider community also – and the professionals who have led the way become valued again for their personal judgement as well as their rigorous knowledge management. In the meantime, we cannot hope to regulate the wider arena but we must engage with it.

References

Armstrong, K., Schwartz, J. S. & Asch, D. A. (1999) Direct sale of sildenafil (Viagra) to consumers over the internet. *New England Journal of Medicine*, **341**, 1389–1392.

Bower, H. (1996) Internet sees growth of unverified health claims. *BMJ*, **313**, 381.

Brown, P. (2002) WHO calls for a health domain name to help consumers. *BMJ*, **324**, 566.

Carnall, D. (1999) American Medical Association moves to regulate prescribing on the internet. *BMJ*, **319**, 213.

Childress, C. A. (2000) Ethical issues in providing online psychotherapeutic interventions *Journal of Medical Internet Research*, **2**(1), e5.

Clayton, N. (2002) Shop tactics. *Guardian*, Nov. 28. http://media.guardian.co.uk/newmedia/story/0,7496,849507,00.html

Craigie, M., Loader, B., Burrows, R., *et al* (2002) Reliability of health information on the internet: an examination of experts ratings. *Journal of Medical Internet Research*, **4**(1), e2.

Croft, D. R. & Peterson, M. W. (2002) An evaluation of quality and contents of asthma education on the World Wide Web. *Chest*, **121**, 1301–1307.

Davison, K. (1997) The quality of dietary information on the World Wide Web. *Clinical Performance and Quality Healthcare*, **5**, 64–66.

Dorozynski, A. (1996) France concerned about Internet drug sales. *BMJ*, **313**, 1033.

Dyer, C. (1996) Internet sales of prescription drugs investigated. *BMJ*, **313**, 645.

Eaton, L. (2002) A third of Europeans and almost half of Americans use internet for health information. *BMJ*, **325**, 989.

El-Rahdi, A. S. & Carroll, J. (1994) Management of fever. In *Fever in Pediatric Practice* (eds A. S. El-Rahdi & J. Carroll), pp. 229–231. Oxford: Blackwell Scientific.

Eysenbach, G. (1998) Towards quality management of medical information on the internet: evaluation, labelling, and filtering of information. *BMJ*, **317**, 1496–1502.

— (2001) An ontology of quality initiatives and a model for decentralized, collaborative quality management on the (semantic) World Wide Web. *Journal of Medical Internet Research*, **3**(4), e34.

— & Till, J. E. (2001) Ethical issues in qualitative research on internet communities. *BMJ*, **23**, 1103–1105.

—, Powell, J., Kuss, O., *et al* (2002) Empirical studies assessing the quality of health information for consumers on the world wide web: a systematic review. *JAMA*, **287**, 2691–2700.

Gagliardi, G. & Jadad, A. (2002) Examination of instruments used to rate quality of health information on the internet: chronicle of a voyage with an unclear destination. *BMJ*, **324**, 569–573.

Garton, L. (1997) Studying online social networks. *Journal of Computer-Mediated Communication*, **3**(1) (on-line serial). http://www.ascusc.org/jcmc/vol3/issue1/garton.html

Gibson, O. (2002) Australian court in landmark internet ruling. *Guardian*, Dec. 10. http://media.guardian.co.uk/newmedia/story/0,7496,857238,00.html

Gomez, E. (1997) Take steps to assess the quality of cancer information on the Internet. *Oncology Nursing Society News*, **12**(9), 9.

Hernández-Borges, A. A., Macías-Cervi, P., Gaspar-Guardado, M. A., *et al* (1999) Can examination of WWW usage statistics and other indirect quality indicators help to distinguish the relative quality of medical websites? *Journal of Medical Internet Research*, **1**(1), e1.

Hodson, P. (2001) *New Guidelines for Online Therapy*. http://www.bacp.co.uk/members_visitors/media/current/public_press_release_internet.htm

Illman, J. (2000) WHO's plan to police health websites rejected. *BMJ*, **321**, 308.

Impicciatore, P., Pandolfini, C., Casella, N., *et al* (1997) Reliability of health information for the public on the World Wide Web: systematic survey of advice on managing fever in children at home. *BMJ*, **314**, 1879–1881.

Ipsos-Reid (2001) *Hypergrowth a Thing of the Past*. http://www.ipsos-reid.com/media/dsp_displaypr.prnt.cfm?ID_to_view=1229

Jadad, A. R. & Gagliardi, A. (1998) Rating health information on the internet: navigating to knowledge or Babel? *JAMA*, **279**, 611–614.

Jones, J. (1999) Development of a self-assessment method for patients to evaluate health information on the Internet. *Proceedings of the American Medical Information Association*, 540–544.

Josefson, D. (1996) Herbal stimulant causes US deaths. *BMJ*, **312**, 1441.

Kim, P., Eng, T. R., Deering, M. J., *et al* (1999) Published criteria for evaluating health related web sites; review. *BMJ*, **318**, 647–649.

Lloyd, M. G., Schlosser, B. & Stricker, G. (1996) Case vignette: cybertherapy. *Ethics and Behaviour*, **6**, 169–177.

Mayer, M. & Till, J. E. (1996) The internet: a modern Pandora's box? *Quality of Life Research*, **5**, 568–571.

Netcraft (2002) *The Netcraft Web Server Survey*. http://www.netcraft.com/Survey/index-200211.html

Price, S. L. & Hersh, W. R. (1999) Filtering web pages for quality indicators: an empirical approach to finding high quality consumer health information on the World Wide Web. *Proceedings of the American Medical Information Association*, 911–915.

Risk, A. & Dzenowagis, J. (2001) Review of internet health information quality initiatives. *Journal of Medical Research*, **4**, e28.

Sheldon, T. (2002) Trust mark launched as a guarantee of safety in the Netherlands. *BMJ*, **324**, 567.

Siegel-Itzkovich, J. (1997) WHO calls for tighter controls on internet. *BMJ*, **314**, 1501.

Sieving, P. C. (1999) Factors driving the increase in medical information on the web – one American perspective. *Journal of Medical Internet Research*, **1**(1), e3.

Sixsmith, J. & Murray, C. D. (2001) Ethical issues in the documentary data analysis of Internet posts and archives. *Qualitative Health Research*, **11**, 423–432.

Smith, R. (2001) Almost no evidence that the internet harms health. *BMJ*, **323**, 651.

Terry, N. P. (2000) Rating the "raters": legal exposure of trustmark authorities in the context of consumer health informatics. *Journal of Medical Internet Research*, **3**, e18.

Veronin, M. A. & Ramirez, G. (2000) The validity of health claims on the world wide web: a systematic survey of the herbal remedy Opuntia. *American Journal of Health Promotion*, **15**, 21–28.

Wilson, P. (2002) How to find the good and avoid the bad or ugly: a short guide to tools for rating quality of health information on the internet. *BMJ*, **324**, 598–602.

Winker, M. A., Flanagin, A., Chi-Lum, B., *et al* (2000) Guidelines for medical and health information sites on the internet. Principles governing AMA web sites. *JAMA*, **283**, 1600–1606.

Wootton, J. C. (1997) The quality of information on women's health on the Internet. *Journal of Women's Health*, **6**, 575–581.

Multiple choice questions

1 Have people been physically harmed by products bought on the internet?

a no, never
b only by products they could have bought in other settings
c yes, because the internet provides the opportunity to buy drugs normally available only on prescription
d yes, because the internet provides the opportunity to buy illegal substances
e both c and d are true.

2 Can quality trustmarks be used to identify sites that will provide good-quality health care?

a yes, their presence allows people to trust the information they are accessing
b yes, but not all trustmarks are reliable
c not yet, but recent legal rulings on trustmarks have helped to resolve this area
d yes, if people take the time to access the organisations providing them and ensure they actually do endorse a particular site
e yes, but they only work in certain countries.

3 The following areas are now more regulated as a result of landmark legal cases:

a content of an advertising nature should be clearly discernible
b material on a website in one country is subject to libel laws in different countries

c website addresses that end in .health are now available
d trustmarks are now a legal obligation
e there is a central registration point for all sites.

4 As regards medical research into health care website quality:
a a recent paper found that raters had poor inter-rater reliability using questions they had designed together
b the use of standardised tools is now helping to regulate this field
c qualitative research is now no longer the primary method
d ethical approval is now needed to use websites in scientific study
e there is now an online journal for medical internet research.

5 The quality of health care information on the internet can be roughly assessed by:
a online guidelines such as the HON Code
b the presentation of the website
c the presence or absence of advertising
d using medical search engines such as Omni
e the links to a particular website.

MCQ answers

1	2	3	4	5
a F	a F	a F	a T	a T
b F	b T	b T	b F	b F
c T	c F	c F	c F	c F
d T	d T	d F	d F	d T
e T	e T	e F	e T	e T

CORRIGENDUM

Luty, J. (2003) What works in drug addiction? *APT*, **9**, 280–287.

In Table 1 (p. 281) naltrexone is listed as an opioid agonist. This is incorrect: naltrexone is an opioid antagonist. The corrected table appears opposite.

Table 1 Drugs used in opioid dependence

Medication	*Action*	*Typical daily dose*
Methadone	Opioid agonist	20–100 mg orally
Buprenorphine	Partial agonist	8–24 mg sublingually
Naltrexone	Opioid antagonist	50 mg orally
Lofexidine	α_2-adrenergic agonist	0.8–2.4 mg orally