Guest Editorial

The Internet: future scenario and challenges in medical practice and continuing medical education

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Strictly speaking, the Internet is an **inter**national **net**work of computers. In reality the Net is much more: it is about people, communication and **sharing knowledge**. E-mail, mailing lists, usenet, chat-lines, are just the basics for a net-user; further basic services and applications are increasingly being used in the health system. Search engines, on-line consultation, access to medical databases, and on-line medical journals have become common tools in medical practice and may play an important role in continuing education. Despite its high potential, the Internet has a 'hidden' side, due to concerns about the safety of on-line data and the quality of medical information on the Web. In their papers in this issue, Levine, from the Society of American Gastrointestinal Endoscopic Surgeons (SAGES) and Fisher et al, from the Karlsruhe Research Center give an in-depth analysis of the safety and security issues of data transmission on the Web. Readers are referred to those papers for more detailed information on this matter. The quality of medical information on the Web is still an open question: the future of medical education through the Net strongly depends on whether this problem will be solved and medical sites will be regulated according to standard and uniform principles.

Quality and quality assessment of medical information on the Net

Quantitative and qualitative problems arise from the amount of information existing on the Net. The Net is certainly an unrivalled medical library, and this makes the world-wide-web an extraordinary tool, with the highest potential for medical education. For a web surfer, the best way to find just about anything online is to use a search engine. Search engines can scan billions of Web pages in a matter of seconds. Unfortunately common search engines cannot judge the actual relevance of a site: their software just detects the presence of a search term on a Web page. Health professionals and medical students need dedicated tools such as Medical Resources Directories, Medicine Oriented Browsers or Search Tools. These days, a number of such instruments are available on the Net, they allow you to focus on medical sites only, thus reducing the number of results (hits) on the list displayed following a query. If there are technical (software) solutions for the 'quantitative issue', what about the quality of medical information? The presence of sponsors may raise ethical questions; information on the Web may not be updated, references and sources may be missing. As an educational tool medical Web sites should follow rules and meet quality standards. In 1978, most of the outstanding scientific journals set up the Vancouver group: the *Uniform Requirements for Authors Submitting Articles to Biomedical Journals* were defined with the aim to establish uniform publishing standards. Today these guide-lines are the basis of any publication in the field of medicine. More recently the Vancouver group has established several guidelines to be followed concerning the scientific contents of medical sites: authorship, copyright, date of creation of the document, name of the editor and organization, references and sources, owner of the Web site, and last but not least any possible sponsors must be disclosed. An even more articulated auto-regulation code has been developed by the Health on the Net Foundation [1]. The principles of the HONcode are reported in Table 1. The medical sites

Table 1. HON Code of conduct (HONcode) for medical and health web sites: principle of auto-regulation of medicine oriented web sites

Principles

1. Authority

Any medical or health advice provided and hosted on this site will only be given by medically trained and qualified professionals unless a clear statement is made that a piece of advice offered is from a non-medically qualified individual or organization.

2. Complementarity

The information provided on this site is designed to support, not replace, the relationship that exists between a patient/site visitor and his/her existing physician.

3. Confidentiality

Confidentiality of data relating to individual patients and visitors to a medical/health website, including their identity, is respected by this website. The website owners undertake to honour or exceed the legal requirements of medical/health information privacy that applies in the country and state where the website and mirror sites are located.

4. Attribution

Where appropriate, information contained on this site will be supported by clear references to source data and, where possible, have specific HTML links to that data. The date when a clinical page was last modified will be clearly displayed (e.g. at the bottom of the page).

5. Justifiability

Any claims relating to the benefits/performance of a specific treatment, commercial product or service will be supported by appropriate, balanced evidence in the manner outlined above in Principle 4.

6. Transparency of authorship

The designers of this website will seek to provide information in the clearest possible manner and provide contact addresses for visitors that seek further information or support. The Webmaster will display his/her E-mail address clearly throughout the website.

7. Transparency of sponsorship

Support for this website will be clearly identified, including the identities of commercial and non-commercial organizations that have contributed funding, services or material for the site.

8. Honesty in advertising & editorial policy

If advertising is a source of funding it will be clearly stated. A brief description of the advertising policy adopted by the website owners will be displayed on the site. Advertising and other promotional material will be presented to viewers in a manner and context that facilitates differentiation between it and the original material by the institution operating the site.

which conform to the principles mentioned above may be labelled with the HONcode logo.

Quality assessment of medical sites is provided by other organs and services on the Net, e.g. HealthWeb and OMNI [2–4]. HealthWeb is a collaborative project of the health sciences libraries of the Greater Midwest Region, of the National Network of Libraries of Medicine and those of the Committee for Institutional Cooperation. The project was conceived in 1994 and is supported by the National Library of Medicine. Within this project the library performs four functions: identifying relevant resources, evaluating the resources, providing access to the resources in HealthWeb, making new resources available on the Internet. The reader is referred to [3] for selection criteria. OMNI (Organising Medical Networked Information) is a gateway to evaluated, qualified Internet resources in health and medicine. OMNI is a filter-based service that presents a catalogue of descriptions of carefully selected health and medical Internet resources. All the resources in OMNI have been evaluated according to the BIOME evaluation guidelines which have been established by the BIOME Special Advisory Group for Evaluation (SAGE) [4].

Quality assurance of medical information is a prerequisite for spreading on-line CME. These days, as reported by Gandsas and McIntire in this issue, less than 5% of all credits are earned online in USA.

Beyond the basic applications

Virtual universities, clinical trial websites, virtual congresses, and advanced internet-intranet applications with on-line access to hospital data bases are a step forward. In this issue, Maisonneuve extensively reports on the potential of the Internet in building up a new concept of real-time University, since "it is no longer possible to have a 30-year career based on the knowledge transferred at the university, when

technologies are changing every 5 to 10 years". On the other hand, Santoro reports on the use of telecommunication technology in the management of large scale clinical trials: in a clinical trial web site investigators are provided "with secretarial support through automatic trial report generation and delivery".

The first virtual congress on the Net was held in 1994. On 14–20 April 2002, the 7th Internet World Congress for Biomedical Sciences (INABIS 2002) will be organised by the Internet Association for Biomedical Sciences. The Congress will be held on the website [5] and the audience, connected through the Net, may take part in all the activities or events scheduled during the Congress week: from registration to the visit to the exhibit, from listening to symposia or paper sessions to having access to various information areas or pages such as the meeting program, previous meetings, search, links and communication. Interaction is provided by e-mail or newsgroups. Congress proceedings will be available on the Net after the end of the Congress. Limitations are all related to the present communication technology that requires a rather long time waiting for an internet connection. The Beatrice project has been developed at San Giovanni Hospital, one of the largest community hospitals in Rome, to allow citizens access to the on-line booking of ambulance services. Over 200 different types of services are available. The system was built up to work with any kind of communication hardware and uses a technology based on the TCP/IP protocol. Safety and privacy are assured by a Secure Socket Layers transmission technology with data encryption similar to that adopted for bank transactions. The on-line payment of fees and the consultation of medical reports are possible through the same system. At present, the terminal PCs which have access to the hospital database are located in the offices of general practitioners and in pharmacies [6–7].

What the future holds

Just a few years ago a passing knowledge of the Internet was enough to feel on the cutting edge of communication and information technologies. Today, mastering the Internet is becoming a prerequisite that needs to be updated in the medical field. Broadband Internet (for more detailed information see the paper by Pareras on this issue), soon to come with interactive facilities, will depict a scenario where virtual meetings, teleconsulting, ready access to medical data bases will enhance the quality of both medical education and medical practice. Thus, making the most advanced information to any professional in the health system available throughout the world: from the richest and most industrialized countries to the third world.

References

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