Preface

Welcome to MEDNET 2004

MEDNET 2004 is an international meeting aimed at bringing together researchers, developers and users involved in the application of the Internet in medicine, starting either with a medical or technological background. It is organised by the Society for the Internet in Medicine, an international scientific association devoted to promote the education of the public and of the medical community in the applications of the Internet and related technologies in the fields of the medical sciences, healthcare practice and management.

After the successful editions of MEDNET in Brighton, UK (1996 and 1997), London, UK (1998), Heidelberg, Germany (1999), Brussels, Belgium (2000), Udine, Italy (2001), Amsterdam, The Netherlands (2002) and Geneva, Switzerland (2003), this year's congress will take place in Buenos Aires, over three days preceded by tutorials and workshops.

This year the MEDNET motto is "Bridging the Information Gap". This bridging will result in "Globally Connected Healthcare". Two years ago from Amsterdam we virtually bridged the ocean by having a satellite conference in Buenos Aires, named "Latin-MEDNET" as a try out for the first MEDNET outside Europe. This abstract book of MEDNET 2004 includes topics like: access to health information, evidence based information, impact of the Internet on the care and follow up of patients, quality of the medical content in Internet, bioethical aspects of Internet in health, telemedicine, Internet and continuous medical education, use of the Internet in the management and health administration, use of Internet in clinical multicentre trials, etc.

We welcome the participants from all over the world to this 9th World Congress on the Internet in Medicine and trust this conference will be a start of many new friendships and the consolidation of international collaboration in this field.

Next to the content the atmosphere of Buenos Aires and the warm hospitality of our hosts guarantee some enjoyable days. We will foster the memories for a long time, at least until our second lustrum congress in 2005.

Hans van der Slikke
SIM Chair

Oral Presentations

Use of the Automated Quality Evaluation System for the Comparison of Health Care Web Pages

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The aim of the project is a comparison of web pages of different health related institutions, based on a quality of information presentation. 20 criteria were chosen from the official standards, guidelines and technical rules for publication of electronic information. The aforementioned aspects may be used in systems for quality evaluation of health care web sites. In this conception particular values connected with the quality of web pages are retrieved automatically and the system displays them on the Internet in a up-to-date mode.

54 health care websites were evaluated in total. The results are presented with a decision tree chart. It begins with one root node that contains all of the observations.

Conclusion: The paper discussed the principles of algorithms proposed by the authors for automated evaluation and are used for the comparison of international health care web pages quality criteria.

The comparison demonstrates not only the characteristics of different types of websites, but also a meaningful value of formally measured website parameters.

Feasibility of SMS (Short Messaging Service) for Asthma Diary Data Collection

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Background: Self-management of asthma may improve asthma outcomes significantly. The Internet has been suggested as a tool for monitoring and self-management of asthma. However, in a recent study we found that the Internet interface had some disadvantages and that users tend to stop using the web interface after a short while (http://www.hon.ch/Mednet2003/abstracts/215165482.html).

Objectives: The primary objective of the present study was to evaluate the feasibility of using SMS (short messaging service) for asthma diary data collection from a user perspective. The secondary objective was to investigate compliance with SMS diary.

Methods: The study included quantitative compliance data, based on SMS collection, and qualitative data from a traditional focus group setting. In a period of 2 months, the participants received four SMS messages each day – of which 3 should be replied to. Diary inputs were collected in a database and compliance was expressed as number of diary inputs (SMS replies) divided by diary requests (product of number of days in study and number of diary questions per day) for each participant. The focus group interview addressed the participants' relation to their own asthma in general, their experience with the SMS asthma diary, and their future expectations from the SMS asthma diary.

Results: Twelve asthmatics (6 males) participated in the study. The median (range) age was 38.5 (13, 57) years. The median (range) compliance was 0.69 (0.03, 0.98) – i.e. half the participants reported more than two thirds of the requested diary data. Furthermore, compliance was relatively steady during the study period with no signs of decreasing usage over time. From the focus group interview we learned that in general the participants were enthusiastic about the SMS diary – it became an integrated part of their everyday life. However, the participants wished for a simpler diary with only one SMS message

to respond to and a system with a web interface for system customisation and graphical display of diary data history.

Conclusion: This study suggests that SMS collection of asthma diary data is feasible, and that SMS may be a tool for supporting self-management of asthma (and possibly other chronic diseases) because mobile phones are an integrated part of modern living. The combination of SMS data collection and a traditional web page for data display and system customisation may solve previously addressed problems of poor compliance with web based asthma diaries.

Telecardiology System on Internet Using Compressed and Protected ECG Signals
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Precedents: There are two relevant aspects on the transmission of diagnostic signals, namely the compression of data and the transmission of the signals through Internet. A typical case of compression is that of a Vector Quantizer applied to the ECG signal (VQ-ECG). The effect of errors on VQ-ECG has shown how errors in data damage the waveform of the received ECG signal, resulting to an Error Control System.

Objective: The objective of this work is to evaluate the performance of a telecardiology system on Internet.

Material: A fully functional telecardiology system was used. The system works using a layered architecture, where each stage on the transmission has its dual stage in the receiver.

Method: The acquisition module takes up an analogue ECG signal, with peak value lower than 400 mV, as reference level. This value is suitable to be acquired via a PC sound card.

The VQ-ECG module includes certain vectors, which have been defined as a sequence of consecutive K samples of the signal. Vectors are classified in a block of low and high energy. Each vector comprises of 8 bits (mean value), the identifier of the codes block (1 bit) and the code of the waveform of 6 bits for low energy and 10 bits for high energy.

The third module is the Error Control System, that contains an external Cyclic Redundancy Code (CRC-16) in order to detect residual errors during transmission, a Bose-Chaudhuri-Hocquenghem Code (BCH) (31,21,2) for correcting errors in data block, a bit interleave of 6 bits, to prevent burst error in the communication channel through Internet.

In VQ-VMF the data of one energyvector conforms a 15 bits block and one high-energy vector makes 19 bits block. The blocks of fixed lengths are codified into BCH blocks.

The telecardiology system was tested on various telecommunications networks in Bogotá city, as part of ETB's Network.

Conclusion: The paper concludes that the specific telecardiology system works totally on Internet, and that it is possible to take the ECG signal of a patient through the sound card of a personal computer. It is possible to develop the telecardiology system for compressed data by means of vectorial quantification with a system of error control that guarantees the fidelity of the diagnostic signal where the doctor will be. Some doctors in Bogot¤¢ carried out observations to the results with the ECG signal reconstructed in reception and they concluded that it is acceptable the waveform decoded after the transmission. The tests were made in three public hospitals and some family homes in Bogotá.

Challenges and Difficulties in Initiating a Health Informatics Distance Learning Program for the South Pacific Islands

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The University of Otago has a well-established postgraduate health informatics program that is taught primarily via the Internet. When a need was identified for teaching the program in the South Pacific Island of Fiji it was anticipated that it would be a simple matter to transpose the New Zealand model to Fiji. This was not the case. This paper briefly describes the New Zealand Program, and then explores the unexpected difficulties and challenges encountered in trying to replicate an established teaching program in a developing country. A review is presented of the process required to establish the program and then an analysis of the first year of operation is undertaken. The lessons learned may be of assistance to other teaching organizations that may be contemplating out reach teaching programs in Health Informatics.

Representation of the ECG Signal in XML Format on The Web

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The storage and distribution of electrocardiogram data is based on different formats. There is a need to promote the development of standards for their exchange and analysis on the Web that use the same format. Based on advantages of XML technologies, ecgML has the ability to present a system-, application- and format-independent solution for representation and exchange of electrocardiogram data.

Medical informatics will fully exploit the benefits from its research only when data can be openly shared and interpreted. An important goal is to describe these data independently on the number of channels, instrumentation platform or type of experiments.

The US Food and Drug Administration (FDA) Centre for Drug Evaluation and Research has proposed recommendations for the exchange of time-series data. It includes a hierarchical structure for the representation of signals, including ECG data, which may be encoded as an XML file. This protocol focuses on the acquisition of multiple records from different subjects within a single file. The HL7 committee has been actively cooperating with the World Wide Web Consortium (W3C) to define XML guidelines to represent medical information. However, these efforts have not focused on ECG data. Recent advances include I-Med, which is an XML-based format for clinical data. These messages can include ECG records, which may be described by basic features.

This work introduces a markup language for supporting ECG data exchange and analysis (ecgML). It should support the full spectrum of ECG devices, including standard 12-lead ECGs, Holter monitors, transtelephonic monitors and implanted devices. The main components in this section include deviceID, Type, Manufacturer, Model and a description of filtering technique used during the ECG acquisition (e.g. BaselineFilter and LowpassFilter).

Conclusion: ecgML will enable the seamless integration of ECG data into electronic patient records (EPRs) and medical guidelines on the Web. This protocol can support data exchange between different ECG acquisition and visualisation devices. The data and metadata contained in an ecgML record may be useful to improve pattern recognition in ECG applications. A series of tools are being developed to

assist users in exploiting ecgML-based applications. Further research will address the following issues. Does on-the-fly compression (as used by HTTP 1.1) make a difference in terms of transmission speed? Is it feasible to use ecgML in applications such as 24 hour monitoring? Does ecgML data contain all the significant information required for ECG analysis?

Developments in Experience and Attitudes towards Use of Information Technology among First-Year Medical Students
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Background: As more and more IT resources become available both for support of campus- based medical education and for Web-based learning, it becomes increasingly interesting to map the information technology resources available to medical students and the attitudes students have towards their use.

Objectives: To determine how extensively and effectively information-handling skills are being taught in the medical curriculum, the study investigated computer availability and usage, and attitudes towards information technology among first-year medical students in Aarhus, Denmark, during a five-year period from 1998 to 2002.

Methods: The study was incorporated into a brief classroom introduction to e-mail and the Internet given to students during their first weeks of medical school. A total of 1159 students (78%) participated by answering a Web-based questionnaire.

Results: Overall, 71.7% of the students indicating they had access to a computer at home, a number that did not change significantly during the study period. The power of students' computers and the use of e-mail and Internet did increase significantly. By fall 2002, approximately 90% of students used e-mail regularly, 80% used the Internet regularly, and 60% had access to the Internet from home. Significantly more males than females had access to a computer at home, and males had a more positive attitude towards the use of computers in their medical studies. A rather constant number of students (3–7%) stated that they would prefer not to have to use computers in their studies.

Conclusions: Taken together with our experience from classroom teaching, these results indicate optional teaching of basic information technology still needs to be integrated into medical studies, and this need does not seem likely to disappear in the near future.

Pilot Study as A Preparation for the "Perfect D"-Study: A Multi Centre RCT on Teledermatology
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Teledermatology provides a modern way of communication between general practitioners (GPs) and dermatologists through the Internet. Up to now there is no valid scientific evidence of the benefits of telemedicine or teledermatology. With our randomised controlled trial PERFECT D (Primary care Electronic Referrals: Focus on Efficient Consultation using Telemedicine, in Dermatology) we gain to provide valid scientific evidence about teledermatology effects. The main outcome measure is the proportion of preventable referrals to the hospital.

During the pilot study, 54 patients were included (mean age = 44, SD = 24, 57% female). The number of included patients varied per GP from 2 to 17 (median 3). There was a clear difference between the GPs. Although Dutch GP practices are modernised with computers and fast Internet connections, it appeared for teledermatology they lacked basic ITC skills (e.g. Windows).

Nine GPs considered the use of the camera and website as not difficult prior to the use of teledermatology. However, especially in the beginning of the pilot, 21% of all digital images were not good enough according to dermatologist. After using teledermatology, seven GPs considered the use of equipment as not difficult. One GP had no opinion about it.

Conclusion: Based on our pilot we concluded that the GPs are capable of using teledermatology in our study setting and including a sufficient number of patients. However, from our study we have learned that in order to achieve this, the GPs need to be trained intensively, continuously motivated and supported during the implementation of teledermatology. Implementing teledermatology is not a technological challenge, but a challenge of a personal training and a well-prepared logistic procedure.

Model of National Registry of Case Reports with Graphical Information and Mesh Tree Structure
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We attempt to link two different sources of information and create a registry of case reports with graphical information and terms of standardisation aimed primarily at national use.

The case report structure depends on local conditions and case reports also reflect national medical care management. In addition, they permit sharing of clinical experiences in different specialties of medicine.

Clinical departments of the 1st Medical Faculty were involved to create the case reports and provide graphical information and posted this project on web pages, which allows an easy access for professional users.

National Medical Library in Prague helps us with standardisation of medical terminology. The aim of our activity was to organise the information in an optimum way. We used the system of standardisation of included information by means of Mesh.

Our system of standardisation includes diagnosis, differential diagnosis and key words.

In editor form, we indicate the corresponding MeSH standard descriptors with theirs numerical codes.

The diagnosis is encoded with codes, which represent the case reports at location in the MeSH tree. One term can include a few numerical codes and in this way it can be placed into different branches of the MeSH tree.

Differential diagnosis and key words are standardised only for exact searching of the registry

Conclusion: A case report can reflect occurrence of specific features of diseases, which are typical for local conditions. It is very useful to use Internet for publication of graphics and pictures attached to case reports, the use of Web enables sharing of information among users.

However, by doing this, it is essential to standardise on medical terminology. Term standardisation allows better searching, possible structuring of records in MeSH tree and other operations; similarly as in international web directory Health On the Net Foundation. The use of MeSH for indexing of medical picture databases at national level is not quite usual. Our paper demonstrates use of this principle for optimum categorising of given information.

Development of An Information System Based In Electronic Health Records (EHR) to Support Decision Making in Emergency Rooms

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Emergency rooms services are places where, day by day, vital decision are taken, such that can represent success or failure, just with a thin line of separation. There are many factors described that can affect the capacity of decision-making and giving support to this process is essential.

Historically information systems had been so expensive especially in the development, fortunately today there are a lot of open source – free distribution tools to support this kind of proposals. The axis of a clinical information system to support decisions is the medical record in self. An EHR was developed with interface Web Browser orientation seeking dynamic behaviour. We used PHP was as base language, with some support of javascript and MySQL as Data Base Management system.

A "transactional model" was implemented where there is a definition about clinical data to be collected named as "events", which are in charge of control the data behaviour. It was possible to identify 375 single events. Each event is classified in one of nine types of event according with how data are collected and showed. Is this order of ideas a health record is a set of transactions or events stored chronologically from which is possible to reconstruct all the patient history. There is a set of tables that supports the "knowledge" of system that includes vademecum, CIE-10 (ICD-10), handling guidelines, among others. The system is data driven focused in initial form, diagnosis and order entry.

Then there is an informatics tool that can be released under GNU license, able to handle clinical data from patients in an emergency room, and adaptable potentially to any kind on place depending of definitions made in transactional model. That incorporates alerts to errors, helps to orient the physician and presents alternatives to be followed contextualized.

Development of a Web Based Lexicon Tool for Spanish Language

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The Hospital Italiano of Buenos Aires is a University hospital, in Buenos Aires, Argentina. Since 1998, a full Hospital Information System (HIS) was developed. More than 120,000 ambulatory visits and more than 2,000 inpatient episodes are processed each month using our Electronic Medical Records (EMR).

Physicians enter diagnosis information in the EMR as narrative text, without restrictions, later a group of trained coders assign standard vocabularies codes to those text descriptions, using ICD-9-CM, ICD-10, ICPC and SNOMED.

In order to perform automatic codification of diagnosis text descriptions a lexicon was designed. A lexicon is a software application that processes strings eliminating inflections, derivations, acronyms, etc., and obtaining a new reordered, normalized string, composed by the "base forms" of each word.

This tool is used to compare different strings with the same meaning and assign diagnosis codes by repetition, which is if "Back pain" and "Painful back" share the same base forms "back pain", both of them should be represented with the same code in any given vocabulary.

To achieve this goal an emulation of the Specialist Lexicon of UMLS was performed, as reported in other languages (German and French). Initially more than 40 lexical rules in Spanish had to be created form scratch, and lengthy tables of synonyms, derivations, articles, etc. had to be filled.

Conclusion: A prototype was created using J2EE technology, is published on the Internet, and is tested and maintained by several collaborative groups in different centres around the country.

Medical Program Administrator: A Study and Functional Analysis of Software for Follow-Up and Control of A Patient Population with Chronic Diseases

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Purpose: To perform an investigation of needs and a functional analysis of software for follow-up on a population of patients with chronic diseases and their contacts with the Medical Program, using records from existing medical information systems (CPR, Admission, Appointments, etc.)

Methodology: Anecdotes (Storyboards), Use Cases and Activity Diagrams were used for UML documentation.

Basic Definitions: The Medical Program Administrator is a software package that manages a patient population with chronic diseases in order to schedule for each patient and enable the follow-up of Medical Program contacts with the patients, with priority based on patient risk. It includes as well a defined clinical practice guide for the treatment of chronic diseases.

Design: A system that integrates various medical information system patient data was designed to perform follow-up on patients based on their risk. The system automatically detects those patients for which clinical (results of practices and procedures) or attitudinal (adherence to treatments, consultations, etc.) parameters were incongruent with the expected values as defined in clinical practice guidelines. Based on this selection process, which users can adapt and customize, the system generates patient contact lists, and these in turn generate e-mail reminders for patients. Scheduling can be done by patient or by patient group, as can be the definition of control objectives, and the system adapts automatically to the clinical parameters and the performance of examinations and procedures, allowing for a personalized follow-up of patients. This software, like other medical information systems, has been developed in a web based format and can be integrated into the institutionalet.

Conclusion: The Medical Program Administrator is a system that analyzes patient data from various medical information systems, allowing for a personalized follow-up of each patient, and which automatically orients Medical Program resources toward those patients of greater risk. This enables better treatment of chronic diseases, thereby contributing to a decrease in morbidity and mortality and an improved quality of life in this population.

Latin American Program for Medical Education

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The Argentine Medical Association (AMA) has developed several undertakings through the use of Information and Communication Technologies (ICTs), targeted to postgraduate continuous education for the health team. In the last few years, the use of Internet has given to these endeavours a new impulse.

Different problems were discussed because we aimed at generating a program with Latin American reaches. Furthermore, more than 1,300 writers were already participating in different ICT supported endeavours. Therefore, it was necessary to bear in mind other considerations besides the generation of content, such as:

1. To include representative academic entities of the different countries so that the program might be sponsored and certified in the place where the student was and not in the place where the content originated.
2. To achieve a continent-reaching program that at the same time will allow each participating country to supply their own regional programs.
3. To form a work team made up of professors, specialists in communications, editors, technicians, etc.
4. To obtain a solid technological partner with sufficient resources, present throughout Latin American that would understand the importance of maintaining the academic value of the program beyond the merely commercial aspects.

Thus, the Latin American Program for Medical Education (LAPME) was formed. It already consists of more than 30 on-line courses and certificates, sponsored and continually growing, to which Pronadameg (after the initials in Spanish of Program for General Practitioners of the National Academy of Medicine of Mexico) was recently added. Also added was the Digital Medical Library of AMA, which when it migrated to a web format became a collection of more than 85 multimedia treatises that are also growing constantly and have become a powerful reservoir on information with thousand of pages of text, more than 30 thousand medical images, more than 1,000 videos, clinical cases, interactive evaluations, etc. Furthermore, it should be pointed out that before the process of migration, the whole library was updated. The latest addition to the program was the possibility of transmitting through video streaming directly to Internet all the daily activities in the different rooms of AMA.

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Accessing eMR/eHI via the Internet During a Bioterrorism Attack
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Recognition of the anniversary of 9/11 has come and gone again, somberly and poignantly as it always has and always will. We will recall that one of the many lessons we learned on that horrific day was that our reliance on wireless communication was unexpectanly interrupted at a time when critical information needed to be communicated and shared. Our reliance on technology as an enabler for swift and accurate communications continues to grow as we continue to more forward with creating "paperless" societies. In healthcare, we are committed to improving our delivery of care by incorporating technologies, increasing our speed and access to "just-in-time" health information (HI) upon presentation of a patient with symptoms that are acute in nature or where mortality is imminently threatened. During a bioterrorism attack, access to such information will be crucial. The critically and potentially catastrophic nature of the event strongly support arguments made on the behalf for moving away from a paper based medical record to an electronic medical record (eMR). If the eHI has been reposited on the Internet, hosted by "x" third party and access to the Internet becomes disrupted (hard wired/land based or wireless) and/or 'x' third party is "down", how should the staging area for triage of patients presenting with a variety of symptoms prepare to access life-saving eHI from the eMR? Through a the business impact assessments (that includes a risk analysis) that precedes the development of any good business contingency plan where normal healthcare delivery operations would be horrifically interrupted during such an event as a bioterrorism attack, providers can identify their current state reliance, threats and vulnerabilities to their access of eHI via the Internet. As federal, state, province and local governments ready their personnel to be able to address the care challenges that will be presented during a post attack event, the technical challenges based upon our growing dependency upon the Internet for immediate access to health information continue to be overlooked. The oral presentation will address these issues and the 'readiness' findings from select entities (from the government and healthcare sectors) that have been identified and tasked with being "first responders" to such an event. Current levels of their preparedness

as it pertains to accessing eHI under such uncertain and time-sensitive circumstances will be explored and discussed. Practical and implementable solutions to address these issues will be presented during the oral presentation. Geography can no longer be the excuse, impediment or divider that prohibits us from sharing with our world family "lessons learned" or "anticipated'. The Internet must be our friend, not foe. It must be as dependable, reliable, vigilant and as diligent as we must be during these unfortunate times of chaos; our respective citizens are depending on us.

Review of Access Options to the Use of The Internet Concerning Medical, Scientific and Health Policy Informations – A Case Study

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Access options to the Internet have to be differentiatedas far as information of the medical, scientific and health policy field is concerned. There is an increasing professional and non-professional interest in obtaining specific healthcare information. The requirements of these groups are not the same. Non-professionals tend to broad information that is understandable for everyone, professionals prefer specific and extended information.

A basic problem is the background of the information. Which are the sources, are they reliable, what are the quality standards, was there an evaluation etc.? Such questions are highly relevant as to information data concerning the medical, scientific and health policy field.

This study indicates available access options to the internet to provide specific information and data files. Problems for users are being shown, solutions are discussed, and recommendations are given. Obviously there are still lots of unsolved hardware and software problems, which cannot be influenced by users. Insufficient or no access to information and data is resulting. It is also very common that no help indications are given, nor are email addresses noted for specific help or further information.

Conclusion: According to study criteria approximately 60% of websites showed positive, while approximately 40% negative results. This indicates the need for further studies on this issue. Definition and evaluation of professional standards have to be performed. International work groups should be initiated to establish cooperation with scientific and government organisations

Evaluation of the Web-Based CME Courses in Croatia

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Internet has become a leading technology for providing continuous medical education (CME). Recently, such opportunity is offered to physicians practicing in Croatia. Web-based CME courses are provided through "PLIVAMED.net" (www.plivamed.net) and "Teleinterventional gastroenterology" (www.tigel.net).

There were four CME courses offered, mainly to primary care physicians: "Gastroesofageal reflux disease (GERD)", "Diagnosis and treatment of sexually transmitted diseases (STD)", "Treatment of depression and anxiety disorders (DAD)" and "Selected issues in clinical pharmacology (CPh)". Following each course an individual exam with credits could be taken.

In order to evaluate CME courses offered, we conducted a web-based survey among users. Participants were invited through e-mail to a web page containing questionnaire on demographic characteristics, Internet usage and satisfaction with offered courses.

A total of 34% participants took part in evaluation (61/179). There were 35% male (22/61) and 64% female (39/61) users. 92% of participants were younger than 50 years of age (56/61). Our participants are experienced Internet users: 46% have been using Internet for more than 5 years and 33% use Internet on daily basis. They connect to the Internet usually from home (79%), mostly through dial-up connection (80%).

Participants regarded that the offered CME courses were relevant for their routine practice – 81% positive answers for "CPh", 63% for "STD", 60% for "DAD", and 43% for "GERD".

Among the advantages of the web-based CME, participants appreciated access to the recent information, ease of access in rural areas, cost-benefit convenience and possibility of revisiting of the learning material.

On the other hand, as a main obstacle to greater uptake of the web-based CME among physicians, participants pointed out insufficient infrastructure and knowledge of Internet usage, age barriers and lack of time available for education.

Conclusion: Findings of our study are consistent with the results published elsewhere in literature. Further studies are needed to examine sex and age differences among users as well as relevance of the web-based CME in routine practice.

Complementary and Alternative Medicine on the Web: The Use of Quality Evaluation Methods
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Different population studies show that utilization of Complementary and Alternative Medicine (CAM) treatment and prevention methods is a regular part of decision-making process undertaken by significant number of public. Increasing CAM popularity between public gives remarkable social value to rigorous exam of CAM methods safety and reliability. Because healthcare professionals have only limited knowledge of different CAM methods patients are seeking answers on their questions about CAM on the web. The quality of information presented on various CAM websites differs very dramatically. Development of objective measurement methods is one of key areas in control of web CAM information quality.

Quantitative overview results have showed that number of links classified and predefined subcategories for CAM link of four most attended web portals in cz domain have increased two to three times more during 2002 and 2003. Measuring of link popularity service has identified 15 most popular CAM websites within the web health community for further monitoring.

CAM methods areas diversity measurement results of qualitative analysis of monitored websites content show that the most popular areas of CAM methods in cz domain are physiotherapy, psychological therapy and paranormal therapy covering together 68% of CAM content. Seven of monitored websites were giving suggestions to more than one treatment method for cancer and 1st type diabetes therapy. Due to 13% response rate (only two returned questionnaires) we decide to present extremes of entrepreneurs' answers for each question.

Response rate of the email with fictional question sent to CAM providers was 60%. 33% of respondents were able to give appropriate advice. 48% of respondents were able to identify if the patient needs medical option. 52% of respondents have made unconditional claims of CAM therapeutic success.

Conclusion: The most popular websites on complementary and alternative medicine in cz domain offer information of extremely variable quality. Many endorse unproven therapies and presenting CAM providers, which advices can be for potential patients extremely dangerous.

Development of an Educational Medical Virtual Campus Applying an Open Source Software Web Platform

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The Teaching and Research Department and the University Institute of the Hospital Italiano in Buenos Aires, coordinates a wide variety of professional development Activities. At present, 26 Residency programs for medical doctors, nurses, biochemists and pharmacists and around 40 Fellowships in medical specialties are offered. The Hospital Italiano is ranked as one of the most renowned medical human resources development centres in Argentina and Latin America. The adoption of an educational virtual platform has been regarded as an appealing and challenging project by hospital authorities, teachers and students.

Objective: The aim of this project is the development of a virtual educational platform to support the teaching activity in our Hospital, thus applying the potential of the new electronic education technologies in order to improve and transform classic pedagogic models, maximizing interaction, collaborative work and the achievement of collective knowledge.

Platform selection: Several commercially available products and open source software packages were examined. We have finally chosen the "Moodle", which is a cost free platform that can be used unrestrictedly under a GNU license. "Moodle" was created by an Australian educator and programmer. It is being permanently updated by a worldwide community of teachers and programmers. It is an e-learning system conceived upon a constructivist pedagogic approach, oriented to enhance collaborative knowledge.

Technological Implementation: "Moodle", a PHP application, was installed on an Apache 2.0 server (PHP 4.3, MySQL 4.0) on a Linux-Intel platform. All these applications are open source software, requiring non-additional costs except for its configuration.

Academic Implementation: This year our Hospital has created the Virtual Education Committee with the main goal to develop and promote the application of new educational technologies in information and communication (NTIC's) in medical education.

The members of the Committee are staff members from the Teaching and Research Department, the Medical Informatics Area and the University Institute.

Its first task was the creation of the Hospital Italiano Virtual Campus, comprising two areas: "Internal Campus", for Hospital staff users exclusively and "External Campus", for external users.

The Campus enables users to access Online Courses, Virtual Environments supporting blended learning, Electronic Educative Materials and Collaborative Environments (forum, chat, etc).

We emphasize the development of Virtual Environments for blended learning, encouraging participants to familiarize with e-learning and teachers to be transformed into e-facilitators.

Conclusion: Our challenge today is to meet the increasing demand for virtual support that the creation of the Campus has brought about. The interdisciplinary Committee will be required to upgrade their professional development according to the accelerated growth of this pedagogic project.

Evaluation of Children's Anthropometric Features Using Wavelet Decomposition

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The assessment of growth data is an important part of the paediatric consultation. The measurements of weight and height can be charted and compared to reference values obtained from normal population. These measurements are useful to evaluate and track the growth of children because they provide an overall impression of the child's health. This data is usually displayed as a series of percentile curves in order to show the distribution of body measurements.

In this paper, an adaptive method to approximate unorganized clouds of points by smooth curve based on wavelets is described. The general fitting algorithm operates on a coarse – to – fine basis and selects on each refinement level in a first step a reduced number of wavelets, which are appropriate to represent the features of the data set. In a second step, the fitting curve is constructed as the linear combination of the wavelets that minimizes the distance to the data in a least squares sense. This is then followed by a thresholding procedure of the resulting wavelet coefficients to discard those, which are too small to contribute much to the curve representation. In order to reduce computational costs, we use only a level of decomposition, which is useful enough for most of the paediatric data.

In order to obtain data-driven graphics in a web-based medical record, we had to analyze other graphic formats that surpass the well known GIF and JPEG. SVG (Scalable Vector Graphics) is a XML-based web development tool and graphic format. It is ultra compact and standard compatible; separating the graphic from its original data allowing low consumption of web resources. Being a XML-based standard, SVG drawings can be interactive and dynamically generated, creating high-quality medical graphics from real-time data in a clear and fast way with excellent structure, with the possibility of displaying them on the web o email them as a small attachment files.

Conclusions: The use of wavelets for curve smoothing and SVG graphic format are a useful way of displaying children's growth curves on a web-based platform.

Creation of a Web-Based DRG Grouper

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The DRG (Disease Related Groups) is an inpatient episodes classification system, designed for prospective payment, but it's also used for medical management and epidemiological description of inpatient services.

A DRG is assigned to each inpatient episode, as the result of the combination of the primary diagnosis, additional diagnosis and complications, and all the procedures that occurred during that episode. All these diagnosis and procedures must be coded with ICD-9-CM, and using a standardized method the correspondent DRG is assigned.

There are a little more than 500 groups in the DRG classification, so it's usefulness resides in the power of summing up from multiple ICD-9-CM codes, picked from a list of more than 14.000 codes to a

much more simple classification. All episodes included in one DRG have similar clinical characteristics, similar estimated length of stay, and similar cost.

As DRG's are the base of inpatient episodes paying system in the United States, many government-certified companies provide a grouping service for a fee. Outside USA, if DRG grouping is needed only for scientific reasons, is not necessary to pay for this service. In our case we group our episodes manually, but we need to develop an application to improve this process.

Objective: To develop a web based DRG grouper.

Materials and Methods: DRG assignment to an inpatient episode is a complex task, with many variables and poorly documented. Our source of Information about this process was the Ingenix books collection about DRG's, "DRG Expert", "DRG Desk Reference" and "ICD-9-CM Expert", all 2004 version. Another source of information and testing was the web-based grouper from IRP, in http://www.irp.com, a free demonstration tool from a certified USA company.

Results: We created a data model for the DRG grouping knowledge base. ICD-9-CM codes were assigned to correspondent Major Diagnostic Categories (MDCs) and DRGs.

A set of rules was developed for each DRG, representing the necessary combination of ICD-9-CM to assign a DRG. Additional rules were created for managing the exceptions in DRG assigning, related to age, sex, discharge status, comorbidities and complications.

The general procedure is first to assign DRGs in the pre-MDC categories, next to assign the MDC, and at last to execute the rules of DRG grouping. The software was developed using J2EE, and will be available on the Internet.

Conclusion: When using DRG's for others than billing reasons, the option of developing a grouper software is reliable and cost-effective.

Pediatric Patients Parents' Healthcare Information Seeking Behaviour on the Internet

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Objective: This paper aims to establish if paediatrics patients' parents that attend a primary care office use the Internet to seek for health related information regarding their children's health and if they validate its quality with their paediatrician.

Materials and Methods: 501 parents that attended 8 paediatric offices where surveyed from March 15, 2004 till April 30, 2004. The survey was anonymous, previously validated and the data was analyzed using Statistix 7.

Results: The average was of 2 children per family (range 1–8), the main reason for consultation was health control. The mean age of the children was 6.3 years (range 1 month – 27 years) and the mean age of the parents was 35.8 years (34.6 mothers and 37 fathers). 77% of the parents surveyed access the Internet from their home or work, 86% thought that their paediatrician should recommend healthcare sites, although 5% declared having received some kind of information from their paediatricians. From the population under study we found that 46% looked for health information in the Web, the main topics that were searched were: information on diseases (31%), diagnosis or medical treatment (17%) and alternative treatments (16%). Only 15% discussed the information found with the paediatrician. 34% of the parents surveyed declared that their children surf the web and 15% use some kind of parental control software, raising an interesting issue for future studies.

Conclusions: The Internet has become the most important social revolution in the last decades producing remarkable changes in the patient-physician relationship. Based on our data, we believe that many physicians do not get involved in their patients' health education by not providing advice regarding quality of healthcare information on the Internet failing to take advantage of their role as health educators, leaving patients to their own luck. Parents feel that accessing to healthcare information is an opportunity to instruct themselves on topics regarding their children's health. Paediatricians need to provide guidelines on information quality so that parents can access appropriate healthcare information, in order to take an active role on their patients' health education, optimizing the patient-physician relationship.

Micropolicies on the (Global) Information Boundaries – A Bottom-Up Perspective on Telemedicine in Cross-Cultural Settings
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The institution-building approach is widely used to promote development. Rather that focusing on economical indicators, it prioritizes the constitution of organizations and their institutionalization in their environments. Being used by any kind of organizations (national, non-governmental, international), it is a central approach in health development. Design and implementation of telemedicine services in "developing" countries follow the same trend.

In this frame, I situate my study on telemedicine in the Peruvian High Amazon, in order to address some aspects that information micropolicies in developing countries have to deal with. On the other hand, information and communication technologies had and have a great influence in turning attention to knowledge.

This study shows that this information system – although quite flexible – covers the range of activities the situation allows, and develops (even in unexpected ways) coherently with its social context. To explain the situation, it has to be considered that the scientific health institution is socially constructed on a broader level than the organizational one, and that scientific-based health care is not homogenously affecting all the health-related matters, therefore the process of institution-building finds its way accordingly to the social perception of health care.

Here ethnomethodology is used to get closer to beneficiaries' perspective, the concept of discourse allows relating a specific context with the broad support for scientific medicine in developing countries. Both come together into the study of health care institution (and can be used for other institutions). Diverse institutionalized knowledge (made up of explicit and implicit, tacit and practical aspects) enter in interplay during health development efforts. This study aims to propose an approach to improve our description and understanding of social realities that will be targeted by development project based on ICT, and therefore to image suitable efforts to improve health care.

Evaluation of Effectivity of Distance Learning of Medical Informatics
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Objectives: The goal of the work was to contribute to the answer if the distance electronic learning is usable in teaching of medicine. The authors describe results of three experiments that they performed with groups of students.

Results and conclusions: The solution of following issues was searched for. The stated answers might be derived from the results.

Is there any difference in effectiveness between distance form of learning and the presence one?

The effectiveness of distance learning evaluated by knowledge tests is comparable with the effectiveness of the presence form.

How do the students accept the electronic form of presenting educational material? Do they prefer it to the printed form?

The electronic and paper forms of study material are complementary. It is useful to provide students with both types of study material.

Which structure of electronic educational material do the students prefer? 'Screen' vs. 'page'?

Almost two thirds of students prefer materials divided in screens.

What are the technical and other problems that may arise during work with environment for control and evaluation of learning?

The students did not have any problems to work with educational material in the environment of WebCT.

What is the long-term retention of knowledge after the period of distance learning?

The knowledge retention after 12 months evaluated by knowledge test was almost 67% of the original performance of the students.

What are the characteristic features of a successful student in distance form of learning?

The successfulness of the student is positively correlated with ability to adhere to a time schedule and ability to communicate through written text.

Higher knowledge retention has correlated with the statement 'I preferred the on-line course to the classroom course' and with the amount of time a week the student spent with the computer.

Development of a Portable Electronic Medical Record (PEMR) Modifiable Through a Web Interface

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Introduction: Advances in life expectancy result in a growing number of patients with combined diseases and treatments. Also, globalization forces people of all ages to travel frequently, being subject to the potential need for medical care while away from their attending physicians.

Objective: To develop a portable electronic medical record which can be easily consulted and updated from a PC or a Web interface. The device has the following requirements: a) small size, b) large storage capacity, c) cross platform, d) easy to update.

Methods: Based on a Web Services application, the PEMR is a USB 250 MB flash memory card (2GB cards are available if necessary), which holds the medical record in XML format and the images in JPG format. With appropriate adapters, and using HTML templates the information the PEMR contains can be displayed in PCs or PDAs (clients) independently of their operating system. Clients can communicate through the internet to the web server using a web browser and are able to upload the XML files, which are saved in the database server. Clients can also download files from the server to the

PEMR. The web server has ColdFusion installed, which is able to read the XML data and present them in custom templates. Data shown in the templates can be verified and modified if necessary. ColdFusion communicates with the database server and stores data in the database, both in XML and in the server's native format (security). Video files support will be added to the EMR (i.e. angiography, gait and motion, interviews, etc.) These files will be coded as mpeg files (mpeg 2 or 4) with DVD quality.

Results: Still in a testing phase, the Web Services model seems appropriate for the task, providing a portable and reliable electronic medical record.

Conclusion: Dynamic web services joined to continually smaller flash memory devices are a good solution to people who need medical care while away from home.

Internet-Based "Lip Reading" Education for the Hearing Impaired
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Introduction: Hearing loss, either congenital or acquired, is one of the most isolating conditions. Affected patients have to develop new capabilities in order to be able to interact with others. Sign language, though useful, comes in many different flavours and is language dependent, and therefore of limited value. Lip reading (actually called "speech reading"), when mastered, is useful in different languages, thus complementing sign language. Teaching lip reading is a very difficult task. The teacher and student have to be facing each other, therefore it is a one-to-one activity and not all patients can accomplish it. It involves many hours of practice in front of the teacher, thus limiting the number of students.

Objective: To develop an internet-based lip reading course for people with impaired hearing capacity. Requirements for the system are: a) being useful for users with low bandwidth, b) available 24/7, c) include different "teachers"

Methods: High detailed 3D meshes of the upper part of the body, (two men and two women), textured with photorealistic images were constructed with included facial and mouth morphs to be deformable to simulate human speech and expressions. The morphs of these "virtual teachers" were used to construct sets, which represent the diverse phonemes which can be read by watching the face. The "virtual teachers" are animated using 3DS Max and Character Studio (both from Discreet). A plug-in for this program (FaceSation from Vidiator) connects it to a digital video camera that captures the image and sounds of the trainer, and generates instructions for the simultaneous deformation of the "virtual teacher" which copy all facial movements. The video is recorded as AVI and audio as WAV files, and later converted to MPEG files. Lessons with included textual captions are placed in a high capacity web server and streamed on demand by the users.

Results: The system is in being tested at the National Rehabilitation Centre in Mexico in an intranet setting, and will be available through the web soon.

Conclusion: With the use of 3D modelling and the modern compression and streaming methods of the internet, lip reading can be taught efficiently to a larger number of patients with impaired hearing.

Internet-Based Corporal Image Modification in Patients with Anorexia Nervosa and Bulimia

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Introduction: Eating disorders like anorexia nervosa and bulimia involve diverse physical and psychological alterations in affected patients, most of them young women. International surveys show that due to frequent exposure to mass media showing slim models as an ideal, up to 10% of female teenagers can show behaviours, which are consistent with the possibility of developing these diseases.

Treatment of patients with eating disorders is complex and involves endocrinologists, dieticians, social workers, psychiatrists, psychologists and others. If not corrected, eating disorders of this type can lead to sever malnutrition and even death.

One of the major psychological abnormalities in these cases is the loss of perception of the corporal image, by which patients see themselves fat in the mirror even if they are grossly underweight. Psychologists try to make these patients conscious of their corporal image by exposing them to printed silhouettes of women of diverse body weights and letting the patients identify their body with one of the figures. The therapist then shows the patient which image corresponds to their real body and tries to reinforce that image.

Objective: To develop an internet-based program for the modification of corporal image perception in patients with eating disorders. Patients should be able to use the program on a daily basis if needed from their homes, with the use of a personal computer.

Methods: Using Poser (Curious Labs) and 3DS Max (Discreet), high detailed 3D meshes of the human body are prepared. These meshes are textured with a set of clinical photographs taken from the patient. Head and full body morphs are included in the meshes, to be deformable and to simulate diverse degrees of body weight.

Patients have to login to a secure web server with a username and password, and establish a videoconference through MS Messenger, for the therapist to be able to prove their identity. With the video active at all time, the patient has to open some web pages, which show her the rendition of her body in diverse weights. She has to click on each image to see the next one, and the system registers the time she saw each one. She then has to select the one, which, in her opinion, corresponds to her weight, which is also recorded. The therapist determines frequency of the sessions. "Morphing" videos can be constructed from the images, which show the figure turning more obese or thinner in time.

Results: The program has not been tested clinically, but has been developed and tested with healthy volunteers.

Conclusion: This technique might be of interest for other researchers working in facilities were eating disorders are treated, or for those treating patients with diverse phobias, as this kind of repeated, gradual exposure has proven to be effective for them too.

Digital Edition Laboratory and Web Services for Continuous Medical Education

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Introduction: It gets harder every day to keep up-to-date with the advances in medicine. Clinicians are frequently overloaded with work and can't assist to continual education courses. Books and other printed materials are bulky and often expensive.

Objective: To develop a series of free of charge, continual medical education programs easy to access from any personal computer. To establish a digital edition laboratory for the development of high quality audiovisual material.

Methods: The National Rehabilitation Centre, with economic support from the National Science and Technology Council (Mexico) and the Centre for International Rehabilitation (USA), have established a digital edition laboratory, equipped with an audio and video recording studio, digital video (2) and still (2) cameras, lightning equipment, microphones, sound mixers, 4 state of the art workstations, scanners, plotters, printers, etc. With this equipment, high quality audiovisual material is created. Some courses are streamed to the web, and others are used for CD or DVD training modules. Physicians, social workers, IT engineers, graphic designers, and photographers, work to develop these educational products.

Results: Up to date, after 1 year of work, valuable products have emerged from the laboratory and we have started the creation of a video collection of orthopaedic surgery and rehabilitation procedures.

Conclusion: This laboratory can be a good example, for those willing to develop high quality educational material, which can be burned to CD/DVD ROM, or streamed on demand through the internet, thus allowing busy clinicians to update their skills whenever they have the time to do it.

Development of a Database-Driven Internet Telemedicine System Using Open Source Software

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Introduction: The use of Telemedicine to provide health services to distant or underserved areas is now ubiquitous. Diverse modalities have been developed during the last years, including: live satellite teleconferencing, internet teleconferencing and Store & Forward through the internet. Commercial Telemedicine applications are expensive for most developing countries, which are the ones in most need for these solutions.

Objective: To develop a Telemedicine system to communicate consultants from major cities in Mexico with consulting physicians in 32 State General Hospitals and 32 State Rehabilitation Centres throughout the country.

Methods: Several Electronic Medical Record applications were tested. SecondOpinion and MS Physician's Dashboard (based on Windows, SQL and Sharepoint Servers), though very good, were discarded for their high commercial price. From the Open Source efforts, we tried OpenVistA (VA Administration); TORCH (Trusted Open source for Care and Health) (Open Paradigms); and OpenEMR (Pennington Firm).

OpenVistA is en excellent health information system, but too large for our purposes. TORCH is based on an object-oriented database implemented with ZOPE and Plone (programmed in Phyton). OpenEMR is based on PHP and MySQL relational database and incorporates the use of HL7 messaging, ICD-9 and CPT codes and other technologies.

Results: TORCH and OpenEMR were the most appropriate applications for our goals. We installed them in a Linux Server and customized them for our use.

Conclusions: A comparison of both systems will be shown, with results of a pilot test on their usability. Both have pros and cons for their use in Telemedicine, but are good alternatives as free software and allow broad customization.

Medical Information Exchanges Between the Hospital and Urban Physicians via Web Server and Secured Mailbox

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The quality of follow-up of patients often depends on good communication between professionals, particularly between hospital and urban physicians. The emergence of Internet technologies now enables to automate and speed up information exchanges. The main objective of this work is to improve hospital – town information exchange through the use of the Internet technology, to ensure a better continuity in patient support and follow-up. For such a project, the setting up of an elaborated security system at the level of authentication and confidentiality is needed. It requires explicit agreement of the patient for the sending of personal and medical data pertaining to him/her.

The extraction programs have been written in Java language, with JDBC accesses to the Oracle databases of the SIH and to the one linked to the Web server. Their development has been undergone to make them readily adaptable to other types of information systems.

The Web server functions according to the HTTPS protocol and is authenticated by a certificate emitted by a certification authority. It is set up into a de-militarized zone (DMZ), on a different machine from the one that hosts the database. The physician is authenticated via his Healthcare Professional Card (CPS) and can only access his own patient's information. The CPS belongs to a family of chipcards used in France for electronic exchange between health care professionals and their regulating bodies (Social Security). These cards display the name of the professional and a carrier code (PIN) that enables authentication of their holder.

The connection to the Internet site runs through a JAVA applet. The latter, after validation of the PIN code, checks the card for validity by questioning the LDAP directory of the physicians that are referenced by the Public Interest Group (GIP).

An essential feature in this project is the holding, at the level of the SIH, of a table of confederates of excellent quality. In a first stage the medical secretaries manage this manually. In a second stage it will be synchronized with the directory of the GIP.

Conclusions: This project is functional since September 2004. Urban practitioner associations and the town council, via the planing of seminars, make the promotion of this system. Further evolution could focus on two directions: the inclusion of complementary analyses results and radiological clichés, and the integration of the whole of these in the digital record of the urban doctor by using a data exchange standard such as XML.

National Informatics Centre's (Nic) Biomedical Information Services: A One Point Access To Indian Biomedical Literature

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National Informatics Centre (NIC), set up in 1977, was the first premier government organization to introduce IT in India. NIC has been providing e-governance services to the ministries and various

government departments and agencies. To meet the information demands of the medical professionals in the country, NIC in collaboration with Indian Council of Medical Research (ICMR) set up the ICMR-NIC Centre for Biomedical Information in 1986. In 2001, the Centre launched its website and opened up a portal to health information available over the Net. IMC has designed and developed indigenous free access databases, which are IndMED, a bibliographic database of 75 peer reviewed Indian biomedical cover the poorly represented Indian literature in international databases. IndMED's full-text version, the medIND database, launched in 2003 was the first of kind providing free access to select peer reviewed Indian biomedical journals. With full-text of 26 select IndMED journals, this database along with IndMED are being widely accessed from all corners of the world. IMC is currently working on launching of an Open Archive of published and non-published Indian biomedical literature. This Open Archive aims at collecting Indian biomedical literature and provides a one-point access to the medical community not only in India but also those outside India. The 2nd phase envisages inclusion of international biomedical literature in this Open Archive thus enriching its content.

The Indian MEDLARS Centre's (IMC) Objectives are to create indigenous resources of information enabling the medical professionals of the country to have access to peer reviewed literature. IMC strives to create "valuable content" for the medical professionals thus providing a one-point resource for Indian biomedical literature. The Centre's staff has developed the Study Design and Methods after studying and evaluating existing procedures and technologies of creation of digital content. The Open Archive prototype has been developed using the E-Prints software and on the lines of initiatives of Budapest Open Archive. Results have shown that the medIND format has been widely accepted as display and downloading options have been provided to the users. The Open Archive, which is yet to be launched, would definitely have a major impact on the access to biomedical information.

Conclusion: IMC will continue in its mission of "meeting the gap" left by non-inclusion of Indian biomedical literature from international databases and resources by adding more journals to the medIND database. This database would cover full-text of the 75 journals that are being indexed in the bibliographic IndMED database. IMC would also make available an Archive of published and non-published literature, which would be at par with other international resources. This Archive would serve as a platform for making available biomedical literature from one point to the medical community, thus bringing the professionals closer in their research ventures.

To Label or... not to Label?
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The quality of health information on the web is difficult to assess. Therefore, there is a need for objective criteria to evaluate the quality of health related websites.

As Italian Drug Agency, institutional body deputed also to assess the quality of drug information, our aim is to understand if it may be essential to build up a set of criteria to assess the quality of Italian websites providing information on drugs and create our own label as seal of approval of Italian pharmaceutical sites.

The major guidelines to assess the quality of health information sites were assembled. They were screened in order to get a selection of the most used criteria. These parameters were integrated with Italian regulations on drug information. After that a total of 15 criteria were put together. They were subdivided into 4 categories. A score was matched to each category. The method was applied to six Italian websites,

three institutional and three no institutional websites providing pharmaceutical information. A score was given to each site in order to evaluate the quality of the information provided. The maximum score of a site could be 15. The score 9 was considered a pass mark. All the three institutional sites obtained a score higher than 10, though none of them matched up with all the 15 criteria selected for the evaluation. As concerns the no institutional sites, two obtained a score lower than 9 and only for one of them the score was higher than 9.

Conclusion: We concluded that it might be useful but not essential to create our own set of criteria and our own label for the evaluation of Italian drug websites. It might be more fruitful if we educate personnel assigned to supervise drugs related websites and to report sites delivering misleading pharmaceutical information.

Interest Level of Dietetic Providers in Providing Care Via the Internet

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Background: Online healthcare offers potential cost savings and convenience for consumers, and Internet anonymity is valuable for stigmatized conditions, e.g. obesity. Childhood obesity is at epidemic levels worldwide, however intervention programs are expensive, and many communities lack pediatric dietitians. Furthermore, 70% of overweight children say that they are too embarrassed to ask a health professional for help with their weight. Medical boards in the US forbid physicians to provide direct advice to Internet users without a previously established face-to-face relationship, but advice by dietitians may be allowed. There is no data as to the interest and comfort level of pediatric dietitians in providing advice to Internet users.

Materials and Methods: To assess the interest of pediatric dietitians in providing advice to children and parents using a website for overweight children, an ad was placed on NutritionJobs.com. Respondents were directed to a separate website questionnaire, which inquired as to their credentials, reasons for interest in Internet healthcare, practice setting, specialization, hours and compensation sought, Internet experience, connection speed, and feelings about providing advice over the Internet. Questions about providing Internet advice included general advice versus one-on-one advice, chatroom advice, and quality, liability, and licensure issues.

Results: 180 dietitians responded to the ad, and 145 completed the questionnaire. Ages of respondents ranged from 22 to 52, 68 had masters degrees, and 1 Ph.D. Their main reason for interest in Internet obesity intervention included: 32% were intrigued by the Internet as a means of delivering healthcare, 37% felt the anonymity of the web was advantageous for stigmatized conditions such as obesity, 10% liked working from home, 8% liked the flexible hours, 5% liked being located anywhere. 72% had used email with clients. 88% had referred clients to web resources. 68% had used chat rooms or bulletin boards. 12% had their own websites. 24% had worked on or for websites. 67% had a high speed (Cable/DSL) Internet connection. 88% felt comfortable providing advice over the Internet. 80% felt comfortable providing general advice in a live chat room. 85% felt comfortable providing one-on-one advice via the web, without seeing the child in their office, provided that the child and parents understood and signed off on the limitations of online interaction. 3% were not comfortable providing one-on-one advice via the Internet because of liability concerns. 0.6% were not comfortable providing one-on-one advice via the Internet because of licensure/regulatory concerns. 0% were not comfortable providing

one-on-one advice via the Internet because quality of care concerns. Compensation levels required were similar to non-Internet dietitian compensation levels.

Conclusion: This study demonstrates that pediatric dietetic providers have significant interest in providing care to Internet users, if they are compensated.

Hospital e-health Strategies in the State of Illinois

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Objectives: Indicating current facilities in gaining specific information in the medical and scientific field as well as in health policy and research by using the internet.

Study design: Case study and meta-analysis, randomized, retrospective.

Methods: Investigation procedure: search engines. Links. Recommendations for related data access. Data files of institutions, universities, scientific libraries, government and non-government institutions.

Evaluation of obtained data: Source reliable? – Quality? – Scientific studies – Peer reviewed? – Matching current issue? – Alternative search: failure of main sources (internet), new information: continued internet search! – Dealing with search problems: systematic index and sitemap available? - Related links available? – Help available? – Data search not matching? – Alternative specific search. Results: 108 (59.3 %) positive results according to search criteria, 74 (40.7 %) negative results, out of 182 cases.

Conclusion: Search was not effective with reasonable effort in 40.7 % of cases. Further studies on this issue are necessary. There is a need for discussion and definition of professional standards of procedure for internet investigation in medicine and public health. In addition there needs to begin an initiation of global work groups for developing standards and providing specific communication and cooperation for professionals and to Establish contacts (work groups) to government and scientific organisations.

Continuing Medical Education Virtually and Collaboratively Using Conference XP

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It has been observed, in the field of postgraduate medical education, that continuing medical education is a growing need and is a critical resource in keeping physicians up-to-date with the latest knowledge in medicine.

Internet 2 is emerging as the high-speed (low latency, high bandwidth) network for science and higher education, reaching the most important universities and research centres around the world, and thus becoming a valuable resource available for continuing medical education.

Objectives: The aim of this work was to design and implement a tool for continuing medical education, connecting classrooms virtually across Internet 2 using the ConferenceXP real-time collaboration platform from Microsoft Corp. Note: ConferenceXP is currently licensed for Research and Educational use only.

Methods: The system developed is composed of the following pieces:

1) An electronic whiteboard.
2) An application written on top of the ConferenceXP real-time collaboration platform.
3) Continuing medical education content delivered by multiple medical professors to several classes of postgraduate medical students using the application.

Mimio X (http://www.mimio.com/, Boston, Massachusetts, USA) converts a standard whiteboard into an electronic whiteboard. It uses proprietary pens (into which you insert the dry erase marker) to communicate with an ultra-sound based device that attaches to the side of the whiteboard. Mimio digitally capture notes or drawings and can be used with a projector to control an attached computer.

The ConferenceXP real-time collaboration platform was developed by Microsoft Research, with the purposes of real-time collaboration, connecting wireless classrooms, and distance learning, using existing technologies such us wireless devices, tablet PCs, and advanced features in Microsoft Windows XP. It enables researchers and educators to create the distributed, collaborative applications they need by taking advantage of the built-in support for audio, video, PowerPoint slides, ink and networking without having to build them from the ground up.

ConferenceXP was specifically designed for Internet 2 and other multicast enabled networks (wireless or local network hubs). It can take advantage of the high speed and low latency provided by Internet 2 to support multi-point, real-time, video conferencing for the fully immersive experience, and it can scale back to operate efficiently in a wireless environment for slides and ink.

By partnering with research organizations and universities, the ConferenceXP research platform combines the academic community's expertise in the learning sciences with Microsoft's expertise in technology.

The electronic whiteboard application consumes the data from the Mimio whiteboard and then sends it to the remote classrooms via ConferenceXP.

The class included theoretical explanations in the cardiovascular and renal fields, pertinences and medical trials that include guidelines in pharmacological and other treatments such as enhanced external counter pulsation.

Discussion: A very important point in the postgraduate field of medical education is to maximize academic effectiveness and student's feedback. This study attempted to address those issues.

This system was originally developed for education of mathematics and engineering, proving to be an effective tool for that application. It is an efficient way to connect remote classrooms, and has a big potential for use in continuing medical education as well.

One of the limitations of this system is the poor availability of Internet 2 in South America, due to high costs in this region. However, ConferenceXP does support point-to-point connections which are more readily available, as well as allowing multicast disabled sites to link up with multicast enabled sites. We believe this limitation can be managed until such a time, as there is more robust support for Internet 2 or its equivalent around the world.

Conclusion: We conclude that the presented system opens a wide range of possibilities for continuing medical education. Besides the idea presented there is also the possibility of integrating with a research and educational telemedicine network, expanding the possibilities with real cases.

Internet Based System for Remote Patient Care – Teledialysis
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Telemedicine approaches to chronic disease management can promise to reduce risk and improve functionality of patients. However, there are on-going concerns regarding demonstration of definite clinical benefits, cost effectiveness, safety and generalisability.

This project describes a telemedicine approach in one patient group. Patients receiving chronic dialysis for end-stage renal failure require invasive treatment, have significant co-morbidity and are often elderly. Patients can be dialysed in a hospital setting (haemodialysis) or within their own homes (peritoneal dialysis, PD). Since patients requiring dialysis are not completely autonomous and require frequent medical assistance, they may require hospital haemodialysis. This reduces independence and quality of life and increases costs and use of health service resources. Furthermore, patients may live at distance from the dialysis unit so travel for haemodialysis adds to this burden. Therefore, a telemedicine approach to support patients could allow some patients to receive PD at home rather than being forced to hospital based treatment not of their choice. The most important underlying requirement was felt to be the ability to examine the patient in detail, as this would potentially reduce the numbers of visits by patients to hospital or staff to patient. Overall the results of this study are that the system is robust and can be used in a busy clinical area. The call system is easy to use and the patients do not feel that the system is intrusive in their homes. It has proven safe and reliable.

Conclusion: This project has developed a telemedicine solution to assist in the management of a patient group with particular healthcare needs and use of technology as part of routine management.

PRENET® Telemedicine in Prenatal Care

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Telemedicine is the use of advanced equipment technology where the medicine cannot have direct access to special equipments so it has some means such as: video telephones, computers, cellular phones, digital and video cameras for the control or diagnose of diseases. In here, a denominated program PRENET® was made in order to apply the Telemedicine in the prenatal control. 50 patients out of 160 patients were selected who often went to the prenatal appointment of the General University Hospital "Dr Adolfo D'Empaire" in Cabimas city in Venezuela, between the months of June and August 2004. They gathered some criteria selection such as, access to the Internet and telephone cellular system with support SMS and WAP. It was able to supervise among other aspects the Blood Pressure and some other were monitored in two patients who developed severe preclamsy and it also allowed pregnant women to get and keep in touch with their specialists.

Looking for evidence on the Internet: PCOS as an example

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Typing "PCOS" in Google? will give you 1,250,000 hits! How can we help our patients and ourselves to find the most reliable information about this syndrome?

PCOS has in common with endometriosis that both are frequent1y looked for on the Internet. They are chronic conditions, they often play a role in infertility and the sufferers are women between 20 and 40 years old: the most active group on the Internet.

There's another point: the syndrome has many faces and there is animosity between doctors and scientists about the best way to treat the different symptoms. This makes patients sensitive for quacks, who abuse the Internet by promoting doubtful practices and dubious cures.

Recent1y consensus was agreed between the scientists who are experts in PCOS about the definition of the syndrome.[1]

We know patients prefer to look for information in their own language. They feel comfortable in communities, where they can find support and medical advice from their fel1ow-sufferers. Several international English-language PCOS sites will be discussed: we benchmarked them using the criteria of the Health on the Net Foundation (HON)[2] and the Internet Healthcare Coalition (IHC).[3]

The patient feels empowered and brings a lot of prints from the Internet to the doctors' office. Sometimes indeed the patient knows more about the condition than the doctor does. Many of the sites we compared give also good information for the doctor. The process of patient empowerment thus will stimulate doctors' empowerment as well!

For those of you who prefer to ask their clinical questions themselves in a non-biased way, several steps in the process of evidence based searching will be discussed.

This is a structured process in several steps:

– Formulating the clinical question;
– State-of-the-Art searching;
– Critical appraisal;
– Conclude on the base of results;
– Apply the results in practice.

A search strategy, using evidence-based resources will be discussed.

Prescribing Contraception on the Internet

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One of the indicators of good reproductive health is a low number of unwanted pregnancies. In The Netherlands the number of induced abortions has been very low for many years, thanks to the availability of contraception and the way this topic could be discussed in schools and television. However the last years the number of induced abortions is rising, especially in women younger than 20 years.

Several websites do their best to give information about contraceptive methods, some of them particularly for youngsters. Some of these sites started selling prescription-only contraceptives.

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[1] Rotterdam ESHRE/ASRM-Sponsored PCOS Consensus Workshop Group. *Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome.* Fertil Steril. 2004 Jan;81(1):19–25.

[2] http://www.hon.ch/HONcode/Conduct.html.

[3] http://www.ihealthcoalition.org/ethics/ehealthcode0524.html.

Material and Methods: We analysed two Dutch websites, http://www.anticonceptie-online.nl/(A) and http://www.pilonline.nl/(B).

A. The first one is the website of the Dutch Foundation for Contraception (SAN). This is a non-profit organisation. Its goal is to promote and spread knowledge about contraception, as well for professionals as for the public. Last year it started a campaign to have the morning after pill (MAP) available without prescription. As long a prescription was necessary, women could download a free prescription 7×24.

We analysed the log files of these prescriptions to know who were these women and why they did use the website.

B. PILONLINE is a semi-commercial website, where women can order the contraceptive pill of their choice. They have to pay a small fee for the doctor, who then either will provide a prescription or forwards an order to an e-pharmacy, which delivers the pills at home. Because the Dutch government decided (starting January 1, 2004) not to reimburse the OC pill any more for women of 21 years and older we wondered if there could be seen a reflection of this law in the files of PILONLINE.

Results: A. 998 prescriptions for the MAP were evaluated. More than 50% was asked by women of 24 years and younger, especially during the weekends. The main reason they ordered on line was they needed the MAP immediately, because they had a problem with the condom (teared or slipped off).

B. A sample of 100 pill requests before and after January 1, 2004 was analysed. The mean age of the women before and after January 1 was the same.

In general the number of women that did not pass the medical history selection was the same in both groups.

Conclusion: One website enabled women, especially in urban areas, to have their morning after pill with much less delay than if they had to wait for their doctor until the next morning. Moreover the prescription on line appeared to be a good weapon in the lobby to convince politics to make the MAP an OTC product. From the OC-website figures we learn that most women order the pill on line as part of their lifestyle: it is easier than to go to the doctor AND to the pharmacy.

Helping Elderly Patients to Search the Web and Communicate With E-mail

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Objectives: Helping elderly diabetic patients learn how to search the net for medical information and communicate by e-mail with physicians for closer, more accurate follow-up, monitoring of medication, and checking for untoward side-effects before they become too virulent to conquer.

Materials: 100 patients over 70 with diabetes. Five laptop computers in a physician's office. 50 previously discarded PCs given to patients. Two volunteer computer instructors worked with the control group in the office and at home. They were also available for "Help!" phone calls during the week.

Method: 100 diabetic office patients, aged 70 or older, were randomly divided into 50 individuals willing to learn computer skills and 50 who did not have access to computers.

Physical examinations and laboratory work performed on both control and computer-learning patients at the beginning of the study. Both teams were assessed every six weeks for one year.

Conclusions: At the end of one year, the 50 elders who learned computer skills demonstrated far better glucose control and were much more disciplined about following diabetic diets and using recipes found on the Internet than using any dietary advice given in the office. Of the 50 computer learners, an amazing

43 individuals noted that they were far less depressed and worried about their diabetes far less because they could share information with other diabetics on the Net.

Comment: The marked improvement in the computer-learners' outlook on life was slightly surprising and particularly gratifying in the care of these elders trying to manage their diabetes.

After the survey was completed, 37 of the 50 elders, who did not have the benefit of computer learning, requested computer instruction.

Further comment: When we installed 5 laptops in the waiting room for the benefit of any patient who cared to use them, we experienced many fewer complaints about having to wait for the doctor!

First Year Evaluation of a Computer Aided Training Project on HIV/AIDS
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The Institute of Tropical Medicine, Antwerp (ITMA) has used e-mails for years as a low cost telemedicine support for colleagues working in low resource settings

In 2003 the ITMA set up a computer aided training project to guide doctors in the implementation of antiretrovirals (ARVs) and AIDS care in developing countries. The aims of this project are:

– The introduction of high-quality ARV care for HIV/AIDS patients living in resource limited settings, by providing adequate technical support in the field of ARVs and management of opportunistic infections (OIs) to clinicians from the South.

– The provision of continuous medical education in the field of HIV/AIDS for doctors following the Short Course of Antiretroviral Therapy (SCART). In this pilot phase of the project we have offered after a 3 weeks training in HIV/AIDS care and ARV use, an e-mail forum support to guide medical decision-making and management of difficult clinical cases.

Initial partners in the field were existing institutional collaboration projects in AIDS care (Cambodia, Rwanda, Peru), ITMA projects in Mozambique, Family Health International projects in Rwanda and, following the SCART, the students of the course. In almost every setting an internet connection and a digital camera were available.

The telemedicine advice was organized initially through an e-mail network of ITMA and regional HIV/AIDS experts in Asia and Africa and afterwards through a discussion forum on a telemedicine web site. The medical advice is generally supported with bibliographic material, and hyperlinks to relevant web pages.

Between, April 2003 and March 2004 we received 183 questions: 142 were questions on individual patient management, with a direct impact on patient care and 41 questions on general topics (PMTCT, organization of health services for AIDS care). 88/183 were questions on ARVs (drugs interactions, adverse effects, drug combinations), 85/183 on AIDS care (OIs treatment) and 10 on main topics (TB DOTS, vaccination programs, buddy groups).

Conclusion: There is a need for support once projects start with ARV. A user satisfaction survey showed that e-mail/discussion forum support is considered important for patient management, to increase knowledge of medical staff, to reduce referrals and to have access to medical literature. By giving the opportunity to trained clinicians to access continuous support through e-mail and internet we intend to lower the threshold to launch ARV projects in low resource settings.

Internet Access by Patients of Medical Records via Phone and the Personal Computer: A Case Study of Kameda Hospital in Japan

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This paper is based on a two-year case study of Kameda Hospital just outside of Tokyo, Japan. In a recent survey of top hospitals in Japan Kameda was ranked as the number two institutions in the country. Kameda Hospital converted to digital patient records in 1995 and in the last year and a half has allowed patients to access their personal medical records from a secured personal computer from anywhere at anytime. In the summer of 2004 Kameda extended the access of medical records for their patients to secured mobile phones in collaboration with NTT Docomo, the leading mobile phone service company in Japan.

Conclusion: These innovative services at Kameda are still too new to form any strong conclusions about their usage or impact. However they do demonstrate how a mature Electronic Medical Records system can be extended to the home or to the Internet-enabled phone.

Just as financial information is now routinely displayed on both Internet-enabled Personal Computers and Internet-enabled phones the work by Kameda demonstrates that personal medical information can also have an anywhere and anytime capacity. This could be particularly useful in the case of emergency medicine. Also the Kameda Internet solutions allow for uploading of information from the patient to the medical record so in the case of chronic diseases an attending physician or technician can monitor the patient on a daily basis.

Posters

Information System for Health Management of Patients on Public Hospitals in Bogotá City
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Bogotá, Colombia, has 8 million inhabitants of which health services give big problems. Primary problem is health administration because there are many health companies that offer services but they are not integrated. The objective of the research was to establish the conditions and the existing resources for the telemedicine development in the city.

The Distrital University in Bogotá, carried out a research about the integration of services among the public hospitals of the city. The system should be a tool that guarantees the integration of the four zones of the attention in terms of health, and it also ought to pay especial attention to the population linked to the system, offering them opportune, pertinent and enough real time response provided by hospitals.

Conclusion: The network of services among hospitals offers total connection to the system of health of the capital, it also offers spaces in order to prove and to implant telemedicine services, it allows to develop and to establish a unique system health for users.

The system is a primary solution to develop a telemedicine system in Bogotá, since the solution of primary problems has been reached, projects about transmission of data signal and images and other information might be developed to put it in the clinical histories and around other procedures in medicine.

As the piloting has already been made, the integrated service system is now ready to be implemented in the hospitals in the city.

The Internet in the Medical Education: Use of the Virtual Laboratory in The Education of Morphologic Sciences
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In web-based learning there are different possible levels of independence in virtual education, since it contains diverse tools of communication on line (electronic mail, chat, courses online, links). We proposed for a limitless number of students, the use of the Word Wide Web like virtual laboratory in the education of Morphologic Sciences. This allows the update of subjects and taking those activities proposed by teachers and those asked by students, enriching the education. We have implemented the virtual tutorial as a useful tool of remote education in the process of teaching.

Conclusion: The use of the virtual laboratories in the Medical Education provides the students experiences with active learning, facilitating their participation in projects that promote a cooperative work, allows them to investigate, to solve problems, and to develop strategies that facilitate a greater preparation and understanding to them of the society in where they will make his professional activity.

Our Experience on the Use of Internet in a Phase I Clinical Study
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A phase I clinical study was started in 2001 to evaluate a therapeutic vaccine in cancer patients. In the informed consent, the patients were instructed on the possibility to consult via Internet on information on this therapy. Here we communicate our experiences on the advantages and disadvantages on the use of Internet. In the first educational visit to the principal investigators (PI) all patients were motivated to enter specific Internet sites.

Conclusion: In the second visit to the PI, only a limited number of patients consulted Internet information ($< 50\%$), and this was closely related to the socio-economic level of the patients entered into the study. Among the advantages noted in the patients that consulted internet are: 1) a considerable saving in time for further explanations (less questions in the next interview); and 2) the communication patient-PI was facilitated, e.g., the patients showed more familiarity with the medical language. The major advantage of Internet was in the follow-up of the patients residing outside of the city; they kept the communication with the PI more frequently and sent the results of their controls (laboratory and image studies) via Internet. Among the disadvantages we noted: 1) some patients entered Internet to get disease data without medical guidance obtaining too much information, or from non-serious sites and they got confused. 2) This situation generated more questions to the PI and was time consuming. Some patients sent images using programs that were not available at the site of the PI. In general, we noted that the patients need more medical guidance in the use of Internet, and that the physicians also need more education about the different possibilities opened by the Internet. Finally, it is important to stress that all of the patients that entered Internet wanted/needed a personal contact with the PI.

Auto Evaluation and Learning System Based on Connected-Case Resolution Using SQL-Server Databases
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Introduction: The setting of educational activities for 1,800 students for a Medical Microbiology course implies serious difficulties. The insufficient number of experienced teachers necessary to establish an appropriate teacher/student ratio reduces educational quality. The adequate formation of a large group of faculty and the development of the educational task also implies for the School of Medicine a significant impact in the budget and considerable dedication of administrative personnel. For the students, especially for those who work, it represents a considerable amount of time and money to sustain meals out of home and mobilization to and from the School.

Objective: To reduce the time of actual physical presence at activities related to the Medical Bacteriology course without sacrificing quality.

Methods and materials: The students attend a seminar and a number of lectures in which they receive the necessary information to be able to complete the Internet activity. By means of multiple-choice methodology the questionnaires are solved (presented as clinical cases) through the Internet at the Virtual School of Medicine. The activity involves: authentication and activity registry, student answers, immediate issuing of a certificate upon termination of the activity that includes its grading, which is loaded in the database. Later the student can re-enter the activity webpage again in a learning mode to ascertain all correction keys, thus becoming a knowledge-deepening method. Data warehousing resources are applied to operate the accumulated data and to analyze their educational quality.

Results: The virtual practical activity makes possible the improvement of educational quality, the efficient use of the School resources, to have more time for professors and instructors to improve their level, to obtain instantaneous quality indicators and to innovate on electronic and analytic registry. Furthermore, better opportunities are offered to students of lower income or those who live far away from the School.

Java 2 Micro Edition as Development Tool for Mobile Telemedicine Applications: A Case Study, Capabilities and Limits

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A recent tool for the development of portable applications on mobile devices like palmtop computers and cellular phones is Java 2 Micro Edition (J2ME), which brings Java on small devices, although with some limitation (depending also on the language version and profile).

Inside a regionally funded research project, we decided to study its use as a way for developing mobile telemedicine applications. In particular, we selected a specific case study, i.e., a palmtop-based tool to be used on an ambulance for communications with the emergency room, specifically for the triage data exchange, currently based on a semi-standardised paper form.

An application has been developed that communicates patient data over HTTP, independently from the physical connection; however, for the tests we used WiFi. The J2ME version used in development was MIDP 1.0, currently being substituted by 2.0. The developed application can be run on any palmtop computer able to run J2ME, and in principle even on cellular phones, although the interface has not been specifically studied for such small screens. The palmtop-resident application communicates with a server-side application written with Java Enterprise Edition (i.e., servlets and JSP).

The application has been then tested on three typical emergency scenarios and successfully compared with similar software developed in Java 2 Standard Edition and run on a TabletPC (experience described elsewhere).

In the development phase, we found some limiting factors that may preclude the development of more complex applications for telemedicine use, although some of them are being overcome in the novel version of J2ME. In particular, version 1.0 does not allow to directly access serial connections, bluetooth, IrDA (at least, with standard libraries). This may prevent to control external devices like ECG and other, which may be of use for telemedicine applications. Another problem may be given by the fact that current J2ME implementations limit the maximum size of Java classes, which again prevents the development of large programs. Furthermore, we found out difficult to control connection errors by software, which can be a needed technique in order to overcome eventual intermittent connections,

always possible when using wireless communication. On the other side, communications occurs easily through HTTP, without having to bind too much to the underlying transmission technology.

Conclusion: J2ME is a language and system suitable for the development of applications on standard mobile devices like palmtops and cellular phones, able to connect on standard HTTP channels towards web servers. Due to its wide portability, some limitation is present regarding the connection with peripherals. However, some additional library is being introduced in the version 2.0, which may allow further expansions.

Design and Construction of a Website Dedicated to Human Pathology Education

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Introduction: Web-based educational resources have several advantages such as cross-platform independence, accessibility, ease of publishing and low cost. They are also an opportunity for collaboration between centers. In the present work we describe the design and construction of a website dedicated to pathology education for medical students, residents and specialists. The project is a collaborative work between the Medical Informatics and the Pathology Departments at the Medical School of La Plata National University, Argentina.

Material and Methods: A team of specialists in Pathology and Medical Informatics selected representative images of macro and microscopic specimens from a vast collection of 35 mm slides and wrote the corresponding descriptions. Images were digitized at 2400 dpi using a HP Scanjet 7400® slide scanner, stored in CD-ROM in TIFF format, and converted into 72 dpi high quality JPEG images using Adobe Photoshop®. The website was built using freeware (AceHTML®.) and commercial software (Adobe Golive®.). It uses standard HTML and CSS coding.

Results: The site currently covers different areas of general and systemic pathology.

The high quality JPEG images are subdivided by organ system and readily accessible by point-and-click hyperlinks. Each image is associated with a concise description. Special care has been taken to ensure consistency and ease of navigation. Links to online textbooks and manuals, online journals and bibliographic databases have also been included. Teaching files and tutorials are currently being written and will be included in the site.

Conclusions: Information Technologies and the Internet are suitable tools for creation and distribution of educative material for teaching human pathology.

On Line Pharmaceutical Care Postgraduate Course

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The utilization of internet tool has determined an innovation of traditional education, making possible the development of new methodologies teaching and learning. Now the concept of pharmaceutical care is capturing the attention of a growing number of practitioners. For this reason the employment of Internet

facilitates the training and the formation of professionals and offers the possibility to have a forum a discussion for a communication.

The aim of this presentation is the design of an on line Pharmaceutical Care Course with interactive cases.

The Department of Pharmaceutical Care of Pharmacist College of the Province of Buenos Aires, the University of Buenos Aires, and the National University of La Plata have developed the programme of the course. This course uses an educational management software programme development by the Biosphere Foundation, witch facilitates the integration of Internet mediated communications with the on line delivery of course materials.

The course is carried out by tutorial system. It was established a virtual class modality for the training the pharmacist in the field of pharmaceutical care. For this reason each participant requires a computer with access to internet.

The design of the course is comprised of five modules. Every module takes one month and the activity is structured within four weeks:

First week: introduction to each module

Second week: a study of real case

Third week: identification of the problem

Fourth week: resolution of the real case

The issues of the modules are the following:

Module I: introduction to the pharmaceutical care.

Module II: adherence to the treatment.

Module III: habits incorporate in the life's style and the influence in pharmacological treatment.

Module IV: drug adverse effect

Module V: drug interaction

There is a continuing evaluation of the participants with a final examination.

Until the end of October 2004 we had 250 pharmacists registered.

Conclusion: This on-line Pharmaceutical Care Course is an useful tool for training the pharmacists in the process of pharmaceutical care and it allows the acquisitions of abilities in this area.

Today's HL7: Motivation for Different Versions of HL7

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Introduction: The ever-increasing demand for cost efficient and quality patient care has led to making healthcare process heavily dependent on Information Technology (IT). With the rapid evolvement of technology and its impact that healthcare domains experience today, there is an urgent demand for further standardization in the healthcare IT Standards allow the systems to operate and inter-operate in a smooth and seamless manner.

Objective: The study is Description of HL7 Versions and Motivation for different versions of HL7.

Methods and material: using the internet resources, google; Blackwall; Pubmed, Sciencedirect; WHO, HL7, And library resources of The Tabriz paramedical and The Iran Management and Medical Informatics School.

Results: Health Level Seven is one of several ANSI-accredited Standards Developing Organizations (SDOs) operating in the healthcare arena. Most SDOs produce standards (sometimes called specifications or protocols) for a particular healthcare domain such as pharmacy, medical devices, imaging or insurance (claims processing) transactions. It's domain is clinical and administrative data. HL7 Mission is to: "To provide standards for the exchange, management and integration of data that support clinical patient care and the management, delivery and evaluation of healthcare services."

Conclusions: While HL7 2.x meets the demand to move data between systems, modern interchange and interface expectations have evolved, to not only move the data but also, to be able to use it once it has been moved. HL7 Version 3.0 is being developed to meet this requirement. The aim is to produce consistency in definition of different information objects and their representation in messages, thus allowing for easier implementation and the definition of clearer conformance requirements.

Internet and Rare Diseases in Latinoamerica

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The foundation GEISER (or, Group Linkage for the Investigation and support of rare diseases) is a non-funded Argentinean NGO that assists people suffering from rare diseases. Some of our main objectives are: 1. To create networks of communication between patients and specialists, between patients and national and international health clinics, and between professionals and health clinics. 2. To collect and divulge information about rare diseases. 3. To construct a database about these pathologies and their situation, being pioneers in Latin America.

We obtained the information for these constructions from: A. Virtual forum, created by the foundation, of exchange and meeting of people in the same condition. B. Workshops for patients and their family. C. Scientific congresses with general invitation (professionals, government, universities, etc.) D. Stable spaces for means of communication such as newspaper and radio. E. Tracking organizations and those affected in Latin America.

Internet is the most effective means to achieve our objectives, of looking for information and of forming nexuses of communication. However, we cant forget the breach of information in Latin America has caused a large percentage of the population to be excluded from this elemental tool, that is fundamental for those affected by the six thousand rare diseases. We observe that more than 60% of people that connect to the virtual forum are not Argentineans, but from other Hispanic and European countries. It is because of this, we believe the inclusion of people with rare diseases require strategic programs to qualify the general population, as well as access to technology in the municipals, hospitals and schools.

The Digital Signature and the Computerized Medical Record in Internet

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Encryption technology in Internet is not only to protect computerized records but also to resolve the legal value of them. Digital signature and the new law 25.506 in Argentina are the technical and legal

elements that make possible that computerized clinical history is not questionable from the legal point of view. It is not necessary to wait for a Law that regulates computerized clinical records to use them in Argentina with a legal value.

Digital signature in medical records is much more safe than holographic signature in traditional medical records as it cannot be rejected from the legal view point; besides it guarantees that the text cannot be modified; this fact cannot be guaranteed with the holographic signature.

Digital signature is an unquestionable and necessary element for the medical computerized records for several reasons that have to do not only with the legal aspect but also with the security of the clinical data.

Information in medical computerized records in relational bases cannot be signed, thus, it is necessary to make a previous step gathering all the information that has to be signed and we propose, in this work, a few examples to do that.

It is also important to save the information of those persons who are authorized to see it and to guarantee the accessibility of the data of the real owner of the information that is the patient.

Internet & Intranet: The Connectivity Solution for Hospitals in Multiplatform Environment (Wi-Fi, WAP, Wireless and PDA)

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In Medical field physicians need to consult and save information of patients in ambulatory form, and PDA plus wireless technology is the solution. Personal computers (PC) and notebooks are not adequate devices for this purpose and wire connection makes difficult the movements of the physician.

The web enabled software can work in intranet and extranet in multiplatform way allowing the integration of the PDA with wireless technology to the network of PCs.

This technology gives many possibilities to systems developers in health field.

Low cost and trustworthiness are the main advantages to implement it in this area.

Another advantage is its use outside the hospital, in the street or at the patient's address, i.e. outside the medical centre, as it is easy to be carried and it does not need any kind of wire support up to a distance of a hundred kilometres from the antenna at the hospital.

Digital Edition Laboratory and Web Services for Continuous Medical Education

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Introduction: It gets harder every day to keep up-to-date with the advances in medicine. Clinicians are frequently overloaded with work and can't assist to continual education courses. Books and other printed materials are bulky and often expensive.

Objective: To develosp a series of free of charge, continual medical education programs easy to access from any personal computer. To establish a digital edition laboratory for the development of high quality audiovisual material.

Methods: The National Rehabilitation Center, with economic support from the National Science and Technology Council (Mexico) and the Center for International Rehabilitation (USA), have established a digital edition laboratory, equipped with an audio and video recording studio, digital video (2) and still (2) cameras, lightning equipment, microphones, sound mixers, 4 state of the art workstations, scanners, plotters, printers, etc. With this equipment, high quality audio visual material is created. Some courses are streamed to the web, and others are used for CD or DVD training modules. Physicians, social workers, IT engineers, graphic designers, and photographers, work to develop these educational products.

Results: Up to date, after 1 year of work, valuable products have emerged from the laboratory and we have started the creation of a video collection of orthopedic surgery and rehabilitation procedures.

Conclusion: This laboratory can be a good example, for those willing to develop high quality educational material which can be burned to CD/DVD ROM, or streamed on demand through the internet, thus allowing busy clinicians to update their skills whenever they have the time to do it.

E-Learning in Medicine, is There a Connection?

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Health professionals need to keep up with medical knowledge for there every day practice in order to provide the best health care for their patients and improve their skills, so that new medical information can be integrated into the routine practice. Physicians regularly attend medical meetings or conferences, workshops or seminars as part of being engaged in continuing medical education (CME), so as to access up-to-date information.

It has been reported that physicians spend around 50 hours per year engaged on traditional CME activities, although this kind of postgraduate education has been described as not enough for changing physicians' practices o enhance health care outcomes. This could be related to the fact that physicians engaged on traditional CME do not participate in an active way, since most of the activities are lectured-based so they act as a passive audience. Another problem facing traditional CME is that people have to leave their working place or home in order to attend these lectures.

CME activities need to change, in order to involve the learner in an active role by using self-directed learning. The development of Information Technology (IT) and the possibility of using web-based tools for CME can provide a new kind of post-graduate education by using e-learning. This new form of providing "learning with technology" has been tried with success in different industries, mainly those who are close related to IT, but there is little experience on it's application in healthcare.

CME activities using e-learning can involve physicians in self-directed learning and potentially improve clinical performance since it can be integrated to the medical practice. The counterpart is that physicians using e-learning need to have some IT knowledge and interest in changing the way they engage in CME.

We will review the characteristics of e-learning and its potential usefulness in CME, in order to describe the main features that a web-based learning environment should contain.

Conclusions: CME needs to change and adapt to the increasing and changing educational needs of practicing physicians, Internet technology's can help by introducing self-directed CME in order to improve physician performance and the quality of medical care.

The Use of Internet for a Cooperative Multicentered Study About Health Services Quality Rates 2003–2004

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The Internet and the electronic mailing were applied to send and receive all the information and data for a Cooperative Multicentered Study about the Health Services Quality Rates which involved 79 – public and private – Health Centers of nine different regions distributed along the Argentine Republic.

The information was collected and sent by Grant Holders, especially selected for this purpose. They used their regular e-mail addresses that were received by the IT representatives, as well as by the Coordinator and Co-coordinators of the present Study.

In the course of the program carried out between 1st February 2003 and 31st January 2004, 833 e-mails where received by the IT Representatives and 216 e-mails where sent to the Grant Holders.

The Health Centers had to send 17241 data, however 15303 data were received instead, that is to say 88.75%. The remaining 11.25% failed to be surveyed due to different reasons, as for example, operation difficulties, the floods in one of the provinces, which caused the temporary interruption of the Health Center system.

For the surveyed data, 100% was e-mailed timely and properly without any interruption during the time span of the study – one-year round.

Conclusion: The electronic mail constitutes a useful and economical tool to carry out this kind of studies, due to the celerity, reliability and accuracy of the data and information transmission.

Ehealth & Healthcare Management
Exploring the Opportunities in a Developing Country
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Preamble:
1. Global healthcare scenario vis-á-vis Indian healthcare- new horizon.
2. Difficulties faced in current perspective.
3. Possible drivers of the future.
4. Synergy of IT & Medical Science.
5. Issues & opportunities at Indian perspective.

Learning objectives:
It is expected that audience attending this session will learn realistic & holistic view of eHealth in Indian Healthcare scenario.

Objectives:
1. To understand the eHealth in Indian healthcare scenario.
2. Future of healthcare in India.

3. The significant changes and challenges ahead.
4. The issues & opportunities in the Indian horizon.
5. Understand the basics of drivers of the future changes.

Materials & Methodology:

Primary & secondary data analysis. In depth interviews. Participant observation. Focus group discussions. Literature review.

Results:
– Silent epidemiological transitions.
– Patients will have the same access to knowledge as professionals.
– Professionals and patients will become much more equal partners.
– Evidence will become steadily more important.
– Health care systems will increasingly be concerned with chronic not acute disease.
  - Growing ageing population. Conclusions: 1. Healthcare is viewing a paradigm shift in India. 2. The transition is posing a chasm between what health care could do and what it should do and the future is highly unpredictable. 3. At the same time it is worthwhile to think about the future in a planned way. 4. India at the present is gearing up to take this boon for the future as a mean of effective and efficient quality healthcare delivery provision to the masses. 5. Will India be a Healthcare destination by 2010?

Medical Records and Internet – Experience in Uruguay

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It is a punctual experience carried out in America of the South, specifically in Uruguay, to have the Clinical History in available internet in any place of the world the 24 hours of the day, in those patients that accept and want their Clinical History for internet, authorizing them personally to have it by means of a personal access (CAP).

Conclusion: The patient has in time her HC, independent of the place where is, minimizing the times of answer.

The clinical information is opportune. Improves the quality of the medical care.

Special Papers

Enabling Access by Meaning: Clinical Terminology Meets the Semantic Web
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There is obvious potential for the Web to improve people's access to health information and health care, and health information has always been a prominent part of the Web. Despite disagreements about the exact proportion of online individuals who use the Web for health related purposes, numerous studies confirm that the number is significant. There is also widespread agreement that the current Web resources for health are insufficient to realize their full potential. One of the most promising directions of development for health on the web is the "Semantic Web".

A "Semantic Web" is a network in which we and our computers can access and use information based on its meaning, rather than simply based on sequences of characters. Visual processing by a human is assumed to be the way Web pages will be utilized on today's Web. The semantic Web, on the other hand, anticipates that pages containing information can be accessed, understood and reused by computer applications in addition to being viewed by people.

Health applications are prominent in the minds of those developing the semantic Web. The idea of a semantically rich infrastructure for the internet and World Wide Web was popularized by an article in 2001 by Tim Berners-Lee, in which the scenario used to motivate and explain the potential value of the semantic web was based on a story about a woman who needs to see a doctor and also schedule a series of appointments for physical therapy. The scenario supposes that personal digital devices should be enabled to communicate with Web-based resources on the basis of meaning, in addition to readable text. The protagonist of the story is able to ask a digital assistant device to identify a provider, match up calendars, and schedule a series of appointments.

Today, if someone wants to find a neurologist who specializes in Parkinsons disease in the San Francisco area, one approach would be to use a Web browser to find all Web sites containing the words 'neurologist', 'Parkinsons disease', and 'San Francisco', and explore them to find the desired information. Unfortunately, the top hits of this search relate to an annual meeting of neurologists in San Francisco, and don't provide the information needed. A semantic web would contain tagged information so that you and your search tools can tell whether "San Francisco" refers to the site of a meeting, or the location of a practice. Intelligent tools might be able to extract and summarize information from multiple pages, rather than requiring you to read them and summarize the information yourself.

A key element of the infrastructure for accomplishing this meaning-rich Web is a computer-readable representation of "what exists", commonly called an "ontology" or "terminology". The terminology provides a coded list of types of entities (or "classes") along with relationships between them that can be used to reason about what things are and how they are related. The most common relationship is "type of" or "kind of", sometimes also called "is-a". Hierarchies can be created from these relationships, and this allows relatively simple algorithms to make inferences. For example, if the identifier for "neurologist" is placed in a hierarchy under the identifier for "medical specialist", all applications that have access to this hierarchy can answer "yes" to the question of whether a neurologist is a medical specialist.

Most clinicians are familiar with coding and classification systems such as the International Classification of Diseases (ICD) or specific classifications of procedures used for documentation and reimbursement purposes. Most of these systems are designed for epidemiologic reporting, billing, and similar purposes where broad categories that permit aggregation are needed, but significant clinical detail can be

glossed over. For the semantic Web our computer applications need more detailed and clinically focused terminology.

By developing and deploying clinical terminologies that support the semantic Web, we will be opening up extensive new and exciting possibilities for making use of information to improve health care, reduce costs, and provide better access. However, many challenges stand in the way. First, the scope of health care is extremely broad, encompassing medicine, dentistry, nursing, the allied health professions, public health, and non-traditional or alternative medicine. It is also extremely deep, extending from general categories of health and disease down to organ-specific, cellular, sub-cellular and molecular and genetic levels. As a result, the terminology necessary to support integrated semantic Web applications is extremely large. Second, even with a comprehensive terminology, the information resources and patient information need to be encoded or linked to the terminology. This implies re-design of many applications and information resources. Finally, there is a tremendous rate of change of both health information and computer technology, so any efforts to achieve integration must take account of long-term change management in order to retain value and continue to be enhanced and remain current. Despite all these challenges, the tremendous promise of the semantic Web makes it worthwhile to pursue its applications in health.

SNOMED and Emerging Standards for the Semantic Web
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One of the most interesting developments of the Internet in recent years is the idea of the Semantic Web and the infrastructure and standards that have been developed to support it. Standards such Resource Description Framework (RDF), RDF Schema, and Web Ontology Language (OWL) provide new capabilities and also new challenges for developers of applications for health on the net. The Systematized Nomenclature of Medicine (SNOMED) fills a significant need for a reference terminology to support health applications of the Semantic Web.

Developers of the ideas underlying the Semantic Web anticipate that there will be many different application-specific terminologies that are built and used by Web resource providers. It is not realistic to think that everyone will use the same terminology for all possible applications. Instead, the designers of the semantic Web anticipate a need for mechanisms to interoperate between different application terminologies, and suggest that semantic Web application developers might use common reference terminologies to help with the translation.

Building a reference terminology for all of health care would be a vast task, but that is what the developers of the Systematized Nomenclature of Medicine (SNOMED) are attempting. This terminology was created initially about thirty years ago to support the needs of computer-based coding and retrieval of patient data. In recent years, it has grown significantly in size and has added many features that can support its use as a reference terminology for semantic Web applications.

The most recent edition, called SNOMED Clinical Terms (CT), was released in 2002 and has been updated twice a year since then. This edition contains several features that support its use as a reference terminology for the semantic Web.

Breadth of Domain Coverage. In order to be a reference terminology, SNOMED spans the breadth of health care domains and does not limit its coverage according to the boundaries of professions or specialty

groups. It covers medicine, dentistry, nursing, allied health professions, veterinary medicine, and all specialties within these domains. It covers clinical findings and disorders, procedures and interventions, drugs, and the results of lab tests, imaging studies, and other investigations. Its boundaries are defined by what is relevant to health and health care. It does not attempt to cover the vast amount of terminology that is necessary for biomedical research beyond what is clinically relevant.

Separation of Language from Logic. The terms and strings that are used to describe each code are linked to the code through tables. This separation permits translation into multiple languages, and permits the attachment of synonyms, readable definitions, and other linguistic information independent from the structures that specify the computer-readable meaning.

Organization of Concepts in Strict Subtype Hierarchies. There are 273,763 concepts in the most recent release (July 2004), and each one (except the "root") has at least one "is-a" relationship to a more general concept. There are 474,444 such is-a relationships, and these are only the most immediate ones in the directed graph.

Linking of Concepts Using Attributes and a Formal Concept Model. Not counting "is-a", there are 57 different attribute types that can link concepts to each other. For example, the attribute "finding-site" links "laceration of forearm" to the anatomy concept "forearm". There are 512,317 of such defining relationships in the current version.

Use of Description Logic to Support Reasoning. The logic-based expressions and relationships contained in SNOMED CT are based on description logic, also known as terminological logic, which supports the inference of the relationships between individual concepts in the terminology and also supports the ability to compose new concepts to extend the terminology using combinations of existing concepts.

Ability to be represented in RDF/OWL. SNOMED's description logic expressions can be represented using RDF and OWL, enabling developers to combine the emerging standards of the Semantic Web with the emerging clinical terminology standards to produce a truly synergistic and powerful combination.

From its size alone, it is clear that SNOMED CT provides substantial breadth and depth to support the need for a reference terminology for health care on the semantic Web. In addition, its formal underpinnings, well aligned with the technological direction of the W3C standards, will serve as a significant support for developers of applications intended to serve the needs of health care on the semantic Web.

Can we achieve health information for all by 2015?

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This summer an important paper appeared in *The Lancet*, with the title: Can we achieve health information for all by 2015?[4] This paper was adapted from a position paper commissioned by the WHO.[5]

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[4]Fiona Godlee, Neil Pakenham-Walsh, Dan Ncayiyana, Barbara Cohen, Abel Packer. "Can we achieve health information for all by 2015?" Published online July 9, 2004 http://image.thelancet.com/extras/04art6112web.pdf.

[5]WHO. World report on knowledge for better health. Geneva: World Health Organization, 2004. Available at: http://www.who.int/rpc/meetings/en/WR2004AnnotatedOutline.pdf.

Publication in *The Lancet* coincided with the launch of "a global review of access to health information in developing countries". Building on a series of existing conferences world-wide in 2004–2005, the review aims to bring together people from all stages of creation and dissemination of knowledge, to understand more about what is involved, lessons learned and ways forward.

Two members of the SIM board decided to participate and SIM became a member of the Steering Group of the Global Review.[6] SIM would like to address "connectivity for health professionals in developing countries" and to find an answer n questions like "What has happened in the last 10 years, what are the lessons learned, where are we now and what are the priorities for the future?"

SIM/MEDNET will address this topic from the perspective of "Information and Communication Technologies".

When SIM (The Society for the Internet in Medicine) started almost 10 years ago professionals in developing countries were very happy with dated issues of medical journals, which were often sent by charitable committees. They could not afford a reguar subscription. With the booming of the Internet the awareness rose that the medium could be used to inform the lay public about health, disease and medical procedures. Many health professionals considered the general content of the World Wide Web to be of low quality. Many efforts have been done to "kite the westwind": guidelines for lay people were issued by organisations like HON and the Internet Healthcare Coalition. Slowly we realised however that there is no grain of evidence that we will succeed in controlling the content of the Internet.

There are two major steps that changed the face of the Internet: doctors became aware that Internet could be an important resource of evidence for daily practice. The major contribution was without any doubt the appearance on line of Medline/PubMed, a precious gift from the US government to the world. Suddenly it became possible to have recent information directly on line from the centre of Africa or the steppes of Mongolia. However: it still was difficult to read more than the abstract of an interesting paper, because the full text was too expensive. Although recently some major publishers decided to enable physicians in developing countries to access their full papers for free, we expect more from the second step: open access publishing. SIM's journal, The *Journal of Medical Internet Research* (*JMIR*)[7] sticks to this principle: the authors pays a fee for the review and publishing of their paper, which is after the first thought not a bad principle: most research is supported with a grant. This publishing fee is only a small part of it, especially when one considers that the revenues are rewarding: not only can one keep the copyrights of one's own publication, but one can be sure that the paper will be seen by a multiple of readers.

Which are the tools we need to access this information? Apart from the hardware and an Internet connection we need the skills of the evidence method: using an effective search strategy followed by critical appraisal of the selected papers.

For the lay people these skills may be still far away: there is a digital divide between the poor and the rich, even in western countries: it becomes even more difficult if one can not read or is otherwise handicapped. Because our patients lack the skill of the evidence method we need to help them with providing good quality information on our websites. As doctors we will reconquer our position next to the patient, by interacting with them electronically as well. This will not only enable us to archive the communication with our patients in their records, but also it will appear to be cost effective and even enhance productivity.

Therefore, I would like to paraphrase the golden adagium about the fish and the net "If they are hungry for information, do not provide information only, but rather teach them the skill to find it!"

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[6]http://www.inasp.info/health/globalreview/.

[7]http://www.jmir.org/