Scientific Journals, Collective Intelligence and Digital Prosumers. Cardiology in the Era of the Social Networks

The Argentine Society of Cardiology has taken the decision to concentrate efforts on the renewal of its electronic structure of communication, developing a new web environment and expanding its resources and contents. This letter aims at going into the new forms of electronic communication, comprised under the name of Web 2.0, from the viewpoint of an enthusiastic "digital migrant" (see below). We will see that these applications not only have a concrete and even potential influence on publications and medical education, but also promise revolutionary changes in culture and production, and for some of their advocates, these changes reach anthropological dimensions and utopias like hyperdemocracy. (1)

WEB 2.0 OR THE SEMANTIC WEB

The Internet system began as a protocol of interconnection which was limited to military or educational spheres, and has been expanded to become accessible to a large part of the world population. Its initial phase, now called Web 1.0, relied mostly on corporate or institutional pages, and on the interpersonal communication structure through the e-mail. On those pages it was possible to include or accumulate increasing amounts of information while keeping the classical structure of entities that generate information for a given mass of consumers – readers – buyers. This same structure was expanded to medical journals, with access to their publications in pdf or html formats. Over the past years, access has changed from phone line to cable networks, and progressively to Wi-Fi systems that allow for connections in very different sites. There are cities with free Wi-Fi access and multiple combinations to access to information from almost anywhere; in addition, there is the possibility to be linked via mobile phones which include small but powerful computers. However, the revolutionary change lies not only in the increasing development of hardware and the almost universal access, (2) but in the fact that this new era, called 2.0 or Semantic Web, (3) includes substantial differences: the new IT tools provide an unprecedent level of participation and of information exchange.

The essence of Web 2.0 is the possibility –through new resources that will be discussed later– to transform a large number of information or resource consumers into **prosumers**, that is, a permanent combination of information consumption and production of new resources. This neologism was proposed by Alvin Toeffler in his book *The Third Wave*. However, his insight was directed to another phenomenon: a market in which there was a shift from mass consumption to active participation of consumers, personalized in the design and adaptation of the products to their needs, something that has not occurred with consumption goods. Nevertheless, this concept is highly operative for the new forms of network communication: there are several platforms that allow information consumers to add their own information and become producers, both of personal experiences (family stories, techniques, trips, pictures, videos, etc.) and intelectual contributions to the collective creativity. At present, there is an operative system, Linux, with multiple voluntary programmers from all over the world, which is widely used as a symbol and a tool of this new era. One of the Internet creators, Tim Berners-Lee, suggests the term Semantic Web (content encoded by its sense or meaning), (4) which defines the participative requirement in the content development and maintenance. In essence, this instance changes the nature and value of the information, and also forces the development of new languages and forms of collective communication.

I will comment on some of the new means of participation for prosumers in general, and their impact, making clear that in all cases they are free, and they are the result of the past decade and most of them of the past five years; then, we will discuss some developments in the medical field, and the perspectives offered.

NEW RESOURCES: GOOGLE, YOUTUBE, FLICKR, SOCIAL NETWORKS

Google

The new tools include Google search engine (founded in 1998, today it is the undisputed leader among the Internet search engines, largely superseding Microsoft Internet Explorer). Based on effective algorithms, it has greatly facilitated the access to all kind of information, and now it is even competing with the most academic and structured systems in science. Many medical journals have agreed with Google upon search engine systems that speed up the access to information. We invite the readers to search for a medical topic to update in PubMed or Google, and they will notice the difference in speed and access. Google is engaged in a very ambitious project of accumulation of information, and invites all the owners of graphics material (libraries, graphics files, museums) to share that information with the world community by scanning it so as to build up a "universal library". An interesting feature, highly developed in Google, is that, with these new search engines –as it is easily noticed in Amazon (5) when searching for recommendations according to the reader's interests–, it is possible to combine taxonomic

elements (labelled by hierarchical keywords such as the thematic index of a book) with those called **folksonomy** elements. Folksonomy learns from the way in which network participants have access to the information or, in the case of Amazon, the combined preferences of the readers. For example, by commenting that the readers of the book we are asking about were also interested in some others, etc. This relation or search is not based on a planned taxonomy (predefined keywords), but on the experience of the community's purchases or attitudes. Experiences of its use in medical diagnosis have been published, with a high rate of correct diagnoses of complex diseases. (6)

YouTube

YouTube (7) is an easy-to-use platform to upload short videos (up to 10 minutes usually), with a not very high quality image resolution. **Founded in February 2005, it** was bought by Google for US$1.65 billion, a year later. Its growth has been explosive. In January 2009, 6 billion videos were consulted –200 million per day. In turn, 20 hours of video are uploaded to the platform every minute, 75% from outside the United States. Not only do prosumers consume this information avidly –turning unknown figures into famous people, with millions of viewers– but they also upload lessons, home-made films, family parties, artistic videos, and experiences of all kinds. You can also find medical videos of catheterization, ablations, surgeries, anatomical explanations, and many other valuable resources.

Flickr

Flickr (8) is a platform that allows to create personal photo albums online. Over 3.6 billion photos have been uploaded since January 2009. The last time I logged in –on September 23rd– 5,000 new photos every minute were reported.

Social networks

Thus far we have reviewed sites functioning as consumers - producers, through the inclusion of graphics information and the role of the search engine par excellence. However, what defines this new era is the availability of software, which generates social networks and new varieties of creative interaction.

Facebook

Facebook is the most popular social networking site in the world. It began as a tool created by Marck Zuckerberg to promote communication among ex university students, and it has become the social platform par excellence. It allows each person to create their own profile, uploading photos of themselves and their friends', and inviting other people to participate and open their own profiles. Newsfeeds from each profile involving "friends" are instantly updated to the other profiles; this is a not very discreet feature, but it is highly accepted. A total of 175 million pages were estimated in January 2009, and this number increased to 300 million in September. In other words, 5% of the world population have their Facebook profiles, with an exponential growth rate. It is the ideal tool for reconnecting with old friends (childhood friends, classmates, militant fellows, etc.), usually scattered throughout the world in an era of great migrations. It has gradually added multiple tools that consolidate the social networking resources and allow to link very large groups of people with different affinities or attitudes. Over the past months, an emphasis has been put on the potential dangers of physicians' participation in this network, which is generally considered a permanent incursion on their privacy. Just imagine the impact it may have to see one's psychotherapist a little drunk, or dressed up at a family party, or the risk it may imply to see his/her family, properties, or list of friends and relatives in cases of malpractice suits. There are schools of medicine that are already warning their students about the potential risks of participating in this social networking site. (9)

Second Life

This is a virtual community, in which each participant creates a virtual identity called 'avatar': name, age, sex, body image, profession, etc. and stories in interaction with others. Structured as a sort of huge online game, it is used by lots of participants as a means of life through the interchange of the internal Linden dollars, which can be traded by current dollars to get resources that can be utilized (from new clothing to room decoration, etc.). It has also been used for medical training and exercises on Web 2.0 topics. (10)

THE TOTAL LIBRARY, COSMOPEDIA, AND WIKIPEDIA

RSS, wikis, podcast, and blogs. Learning a new language.

In a recent article, (11) Jorge Gómez Jiménez points out: "In *The Total Library*, Jorge Luis Borges defines a huge repository of information in which everything has been put together, and therefore, chaos lies. The Old Man says: *Everything would be in its blind volumes. Everything: the detailed history of the future, Aeschylus' "The Egiptians", the exact number of times that the waters of the Ganges have reflected the flight of a falcon, the secret and true nature of Rome, the encyclpedia Novalis would have constructed, my dreams and half-dreams at dawn on August 14th, 1934, the proof of Pierre Fermat's theorem, […] the Gnostic Gospel of Basilides, the song the sirens sang, the complete catalog of the Library, the proof of the inaccurancy of the catalog. Everything: but for every sensible line or accurate fact there would be millions of meaningless cacophonies, verbal farragoes, and babblings […] dizzying shelves […] –shelves that obliterate the day and on which chaos lies–.*" Interestingly, researchers have proposed Jorge Luis Borges as a visionary who predicted today's chaotic world of the Internet, as it

has been discussed in a recent book. (12) Due to the availability of new forms of searching, that information does not turn into "obliterating shelves", but can be organized adequately and be found magically with the search engine. This is extremely important when searching for medical information, because overabundance becomes the main difficulty when trying to have access to valid or relevant information. Among these forms, RSS constitutes the main advance.

RSS (or RSS feed): abbreviation for Really Simple Syndication or Rich Site Summary, they are criteria or search keywords for different content. They are a way for you to get the information you want about topics of interest, whenever they are updated. Schematically, it is configured by keywords (structured through XML language) that facilitate the search for content in any of the web resources. Its use is fundamental in medicine: in medical journals, like the *New England Journal of Medicine*, or *Nature*, we can personalize RSS, so that the new information meeting these requirements can be sent to suscribers by e-mail, Twitter, or Podcast. This customized indexing system can also be used in PubMed and other medical literature sources, as well as in a variety of resources on the web, like blogs, Facebook, and others. There are several RSS tutorials available on different platforms, which make RSS accessible and easy to use. (13) For instance, one can subscribe to the BBC health topics, and receive that information regularly through different means. (14)

Blogs: short form for the term 'weblog'. These are personal websites with a simple format, for uploading information entries. This information is stored in reverse-chronological order, and allows readers to leave comments. It is used either for personal stories (a sort of life diary or travel log) or for insights on readings or comments on realities. Scientific researchers, writers, members of the so-called urban tribes have blogs, and over the past years, famous politicians also have one. Tipically, the blogger shows his/her preferred topics through shortcuts to other blogs or interesting websites and, in turn, this information is encoded in terms of RSS, and searchable by other bloggers or readers. Several medical journals have added blogs from collaborators to their publications. Interestingly, an article about "the disappeared" (*los desaparecidos*) in Argentina, with a report written by a British physician who visited our country, was published a few days ago in one of the blogs of the *British Medical Journal* which was reviewed for this article. Creating a blog is very simple, (15) and leading medical journals, like the ones mentioned, or like *Nature*, (16) recommend the scientific community to open up to blogs, because –compared with traditional publications– they facilitate more direct communication of experiences in these accelerated and not so wizened times.

Wikis: A wiki is made up of a number of sites or web pages that can be edited by authorized participants, with access to creating new content or modifying the existing ones. Then the content is reviewed by supervisors for its consolidation. The most popular wiki is Wikipedia (encyclopedia configured by wikis), (17) which was launched in 2001 and became a universal encyclopedia that includes a large variety of topics. It currently includes 13 million articles, 3 million of which are in English. Any reader can access to an edited topic and correct it if he/she considers any piece of information is incorrect, or supplement it with relevant data. If this is the case, there is an audit system for updates, but with the exception of sporadic cases of the so-called 'vandalism', the community of readers corrects the existing errors. Wikipedia lies on a *Darwikinian* principle, a neologism that states the confidence in that the network will correct the material progressively until the most appropriate material to explain the problem dealt with is consolidated. (18) We will get back to the meaning of the Wikipedia in the context of collective intelligence. Several undertakings with wikis settings such as general medical encyclopedias, (19) echocardiography, (20) surgery (21) and even evidence-based medicine, have been developed, with mixed success in the medical field. (22) A review of the concept and the utilization of these sites can be consulted in *Medical Wikis: the future of medicine?* (23) The author of this material, Bertalan Meskó, is a newly graduated young physician who has created two sites with great impact on this field, Scienceroll and Webicina. These sites provide a guide for physicians to create blogs, set up an RSS system to keep oneself updated, as well as many other contributions. (24)

Podcasts and vodcasts (videocasts): The podcasts are recordings, most of them short ones, that can be played in different media (MP3 phones, car audio players and, of course, computers). They are used to spread new information or update it. At present, several medical journals allow you to download audio or video to be used by physicians, with the latest information of their publications. They are copies of the old cassettes used in congresses, or recordings of cardiac noises, with the possibility of daily update at no cost. Videocasts add images to the sound, which are also suitable for some cell phones, etc. In Argentina, Edgardo Shapachnik has been a pioneer with his LPM (25) (*Latidos por minuto* [beats per minute]), and Daniel Flichtentrei, with the prolific Intramed website. (26)

Twitter (27): It is a social network in which you can send and read short messages, called 'tweets'. These messages contain less than 140 words, and can be forwarded simultaneously to a large number of the people who have accepted to receive them. Newspapers and medical journals like the *New England Journal of Medicine*, for instance, offer the possibility to update information on cell phones through this system. After the recent elections in Iran, the opponents to the regime underwent serious problems of communication and information, but they managed to call for a huge mob through user networks on Twitter who remained outside the scope of censorship. The video of the mur-

der of a young female mobber was then uploaded to YouTube. (28)

Webinars or Web Seminars: Other forms of communication that are widely used are the free videophones through the Internet, like Skype, and the new resources for group conferences, videoconferences, etc., the videogames with a high number of participants, and other rapidly changing resources which give birth to neologisms, like the term 'webinar' (web seminar). All these resources can be considered simply as passing fads that will eventually find their place, maybe minor than their current place, or be considered as part of an information technology revolution that leads to a new era of collective interaction, underlying the concept of collective intelligence.

INTELLIGENCE OF CROWDS, COLLECTIVE INTELLIGENCE, AND TECHNO-UTOPIAS

After the conference in the Castagnino Museum in May this year, as I was going to bed, I left the small bag with dried fruit on the hotel bedside table, ready for the morning snack. At dawn, while I was chewing the peanuts and raisings, I noticed something different and crunchy in the raisings, but they were not the seeds; when approaching the window, I soon realized these were ants marching weigthlessly through my hand. I immediately discarded the bag, which was massively invaded. I asked my wife where else we could have left food; just in case, I opened a bag where we had carelessly left half a bar of diet chocolate. There were hundreds of ants there, which soon flew out of the window of the hotel onto the ravines of Mar del Plata. Within hours, the group exploration system had proved very efficient: the ants cleverly detected the food source, and focused on cutting it into bits and taking it safely to their nest. Who issued the order? The major research on this subject has been carried out on the ant called Argentina, which invaded Louisiana in 1908, and then spread to California, where it crowded out native species. Demonstrating that the group malfunction of the ant Argentina does not expand to all the species, the information system of this species is cooperative and simple: ants search for food on uncertain paths, exuding pheromones on their way. (29) The ant that returns faster to the nest leaves a higher concentration of pheromones on its trail, which did not have time to dissipate, and that is the signal for the next ant to follow the trail left by the first one, and so on. When the food source begins to be scarce or inaccessible, returning is delayed and the intensity of the smell decreases. This form of self-organization of a large community, with rules based on simple algorithms, with neither chief no orders, is called 'swarm intelligence'. This same concept has been applied to telecommunications systems in search of the shortest route for previous calls in an international network, to the goods delivery system for companies with a large number of trucks that tabulate circumstantial delays in each of the routes according to their own experience, and recently, to mini-robots with interconnected cameras that search for bombs in buildings. In a way, we, living beings, share in each of us that coexistence among individual cells that perform their function and are part of organisms with no specific command, and multiple forms of self-regulation. There seems to be no explicit hierarchies in the brain either, but a huge network operating system.

What is the relationship between this form of mass intelligence and the Web 2.0, and the so-called collective intelligence?

The 'cyber-philosopher' Pierre Levy has deepened the understanding of this phenomenon in several publications and contributions. His classic book is *Collective Intelligence: Mankind's Emerging World in Cyberspace*. (30) I will discuss some of the author's ideas; being an enthusiast of new technologies and of the possibilities they create, he has been described as techno-utopic. In his words, quoted from the book cited above, "Collective intelligence is born with a culture and grows with it. Obviously, when we think, we make use of ideas, languages, and cognitive technologies inherent to a community. But a culturally informed intelligence is not programmed like a colony of termites or a hive. Through processes of transmission, invention, or oblivion, inheritance becomes an element of individual responsibility. The intelligence of a group is not the mechanical result of blind or automatic activities, because it is the individual thinking what perpetuates, invents, and mobilizes that of a society. However, the intelligent community described in this book cannot be reduced to the condition of conventional culture. In an intelligent community, the specific objective is to permanently negotiate the order of things, the language, the role of the individual, the identification and definition of objects, the reinterpretation of memory."

His view is that new participative technologies involve the possibility of a rapid cultural change, which tends to a possibility of unprecedent communication and interaction. One of the clear barriers to human communication, the Biblical curse of the Tower of Babel, are precisely the languages, which are suitable for small communities but are obstacles for this new era. The author foresees a level of communication beyond writing, with formats we cannot determine yet, but which integrate graphic forms, thus creating a superlanguage. The future of a political techno-utopia is also projected: "If our societies are content merely to be intelligently governed, it is almost certain that they will fail to reach their objectives. To have a chance for a better life, we must become collectively intelligent." "The major architectural project of the 21st century will be to imagine, build and lay out the interactive and moving space of cyberspace." "Intelligence must be understood here in its etimological sense: *inter-legere*, joining and working together."

This author also proposed a concept of extraordi-

nary ethical and organizational relevance: the so-called 'trees of knowledge'. (31) As an exercise in a small community or company, it consists of registering the areas of knowledge and experiences beyond the profession or the social status. The author argues that our relationships must be based on reciprocal learning, in such a way that personal identities become knowledge identities. "The ethical consequences of this new subjectivity are immense: Who is the other? It's someone who knows. And besides, someone who knows things that I don't know." "The global judgement of ignorance turns against the issuer. If you are struck by the weakness of thinking that someone is ignorant, find out in what context what he knows turns into gold. Today, we witness a true organization of the ignorance of the intelligence of people, a terrible waste of skills and experience, and of human wealth."

So, this tree of knowledge may perfectly include reading habits, technical and artistic skills, hobbies, religious beliefs, and everything that constitutes the real capital of knowledge that will allow for a major collective intelligence in the interaction. This topic is highly relevant if we associate it with social networks of patients and families. In the author's words, "Are physicians and nurses the ones who heal the bodies? Most definitely. But the relational accompaniment occupies a growing place. Cure is better achieved in humanizing hospitals, where patients are also persons. Treatment for patients is more efficient when they are given instructions about diet, hygiene, deep recognition of their symptoms, sanitary autonomy in general."

This view expands to the utopia of new political forms: "Cyberspace could turn into the place of a new form of large-scale direct democracy. […] The widespread use of these "virtual agoras" would improve significantly the development of questions, negotiation, and decision-making of heterogeneous and disperse collectives." "History will press towards increasing integration of collective intelligences into a universal intelligence, which will also have a collective memory that will preserve and accummulate its knowledge."

Pierre Lévy also predicted the configuration of spaces of collective knowledge, or Cosmopedia. In a few years, this idea has grown, among others, into the huge undertaking of Wikipedia, which we have discussed above, and into the concept of wikis in general, with a great potential.

Techno-skeptic and techno-optimistic critics

Not all views on this development are so optimistic. In a classic book, *Homo Videns*, (32) the Italian political scientist Sartori adopts a negative view in this regard: Individuals growing up with television (and videogames, we could add) build a type of thinking that is independent from the content declared in the media: a world of fast-moving images, short sounds, fleeting ideas, not quite suitable for inner reflection or development of complex concepts. They are future voters of media-friendly politicians, debates in which sweating, loss of concentration or the strengh of a smile are the most important features. Another author with a very critical view on these new forms of communication is Paula Sibilia, in her book *La intimidad como espectáculo* (intimacy as a show). (33) It refers to this new era of personal websites, Facebook, and even cameras that record everything, indiscreet blogs, and literature about the unabashed display of sexuality as a form of allienation, and subjection to specific cultural forms of globalization, where in-timacy has turned out to be ex-timacy. (34)

Other researchers have a more optimistic view about this hypertechnological world, and there is even some bibliographical reference about the benefits of videogames for the acquisition of skills in surgeons. (35) Alejandro Piscitelli is an Argentinian thinker and educator who presents himself as techno-optimist, and is against techno-pessimism. His latest book has been very useful to me for my writing of this letter. (36) I am transcribing a paragraph in which he discussess Pierre Levy's work: "In 1994, he published his work *L'intelligence collective*, in which he already outlines his **techno-utopia**; he believes that opposing to techno-myopia and techno-fatalism is valid, no less than to yadda yadda techno-futurism of the Gates and the neo-corporatists." As shown, it is very difficult to progress on this issue without –fortunately self-explanatory– neologisms. The author, who was the director of the project Educ.ar and is full professor of the Workshop on Telematics and Computing at UBA (University of Buenos Aires), explores the redesign of education for a new generation raised with television and videogames, but with a vision of those who benefit from these new developments. This allows to revalue some videogames, like the demanding and participative *The Sims* and *Spore*, and the television changes over the past decade –even on TV serials– particularly towards complex structures that demand attention and reinterpretation, such as *24*, *The west wing*, *Lost* or *Dr. House*. In his view, both phenomena contribute to the enrichment of thinking and cognitive skills. We will be back to other contributions of this work in following paragraphs.

MEDICINE 2.0. HEALTH AND THE NEW WEB

New categories to interpret the new teaching, and perhaps the new medicine. Natives, migrants, foreigners, and techno-skeptics

Web 2.0 is already interpenetrating into medicine: despite its practice has not been modified, Web 2.0 preannounces imminent changes, comprised as e-Health or Medicine 2.0. Health 2.0 could be defined as "the use of a specific set of web tools (blogs, podcasts, tagging, search, wikis, etc.) by actors in health care, including doctors, patients and scientists, using principles of open source and generation of content by users, and the power of networks in order to personalize health care, collaborate, and promote health education". (37) There

are numerous articles on the many aspects shocked by these new resources. (38, 39)

On a recent review, the authors have pointed out some conceptual limitations: 1) there is no clear definition of Medicine 2.0; 2) the lack of control over information as perceived by doctors (in reference to the electronic medical record) generates tension; 3) security problems related to incorrect information available on the Web with business interests or technical errors; 4) the problem of ownership of content and privacy, with the increasing amount of information available on social networks. (40, 41) Precisely, this lack of a clear definition is the result of the wide spectrum of possibilities that are open to the different aspects of medical practice (care, teaching, research, management, patient assessment, publications, etc.). I will try to summarize some of the fields in which it already has considerable influence.

Medical education and intergenerational dialog

In many countries of the world, young university students have grown up with a large proportion of non-school hours devoted to television, videogames and computers, but with little presence of books in their traditional format. This experience is associated with deep changes in their perception of their place in the world and their access to knowledge, thought structures, aesthetics, property, and willingness to share and interact, among other changes. Due to this stage, these young students are fairly called "digital natives". The previous generation, still in charge of the education and health care, may have been immersed in new technologies, migrating to those new languages and forms of interaction, and thus being called "digital migrants". We may master the language, but we will never be native-like, and we will continue reading the user manuals of cell phones and cameras. Among those who have stayed away are the "digital foreigners", with a very limited use of certain resources, and the "techno-skeptics", who even underestimate the new forms of culture. The fact that digital foreigners and techno-skeptics are on the top educational and academic positions establishes a complex divide and exposes us to the repeated statements of criticism to new generations of "barbarians and illiterates", and it is a nostalgic invitation to return to the scholastic book and the teaching of the "masters". (42) As Piscitelli states when referring to education, "To imagine analog returns to lost paradises that never existed would only make this transition even more difficult, and would prevent new generations from becoming amphibious or multi-literate, which is one of the only passports that we can give them for a more creative and fulfilling life in the world that is coming up on the horizon."

The alternative is the debate and the humility of a generation that is developing in a necessarily "post-figurative" culture, in which the older ones must learn from the youth in several dimensions.

Patients: Changes in relationship and participation

The most important change in health care probably lies in the so-called "empowerment" process of patients, that is to say, a process of acquiring more power and decision on their health problems, based on their deeper knowledge and on their enriched possibility of dialog and consultation. Some of the changes related to this new process through the Web include:

1. Electronic records

Patients' medical records will be included in electronic format, available to patients and general practitioners. This transformation, still slow in our country and with complex issues to be solved (data privacy, patient autonomy, strength and vulnerability of the information), has already been reflected as a nightmare in several movies, like in *The Net*. (43) In this movie, Sandra Bullock is the victim of a hacker attack that changes the whole of her personal and medical history; a severe diabetes is diagnosed and, at the same time, high blood sugar is reported at the hospital lab. In the United States, a reform that will lead to a universal use of the electronic record with rewards and punishments in a few years has been proposed. (44) The introduction of electronic records is necessarily slow, and is exposed to the risk of interfering with health care practices and increasing the risks to patients, as documented recently in an experience on intensive care in a pediatric hospital. (45) A software designed to decrease the errors in drugs has effectively reduced them, but with an unexpected increase in mortality, which doubled during the same period. The reason is complex, but related to the move away of nurses and doctors from the patient's bedside, and to their personal interaction. (46)

2. The enlightened patient

The possibility to better understand health problems by patients and their families will gradually increase, with more informed and participative people. This new reality, experienced as a nuisance and even insolence by most of the professionals nowadays (among which I usually include myself, except when I have a good day), will gradually increase. It is essential that medical associations and journals generate their own materials and and medical pages for patients, on the style of *Medline Plus*. (47) For the purposes of this letter, I consulted the information about abdominal aortic aneurysm. Not only was the information didactic and updated according to the evidence, but it also included a link to all the clinical trials currently in progress that assess this conditon, in case patients or their families would like to participate.

3. Virtual assistance

"Virtual" assistance will be expanding. Consultations by e-mail, and tests and images sent over the Internet are already common and possible, although electronic formal consultations are rare. Two examples: 1) A few weeks ago, the case of a pregnant patient experiencing

an attack of painful sore nipples was published in the British Medical Journal, with no pathological findings when consulting a few minutes later. During the attack, the patient filmed his nipple with her cell phone and sent the material to the doctor, who could confirm the diagnosis of a Raynaud's attack due to the sudden and intermittent change in color. (48) 2) A patient purchased an equipment to check his blood INR level, and an ECG mini-monitor. He was reverted from atrial fibrillation on two ocassions, and shows willingness to interrupt clotting. He keeps a daily log of his rhythm on a daily log, and can send the information in JPG files over the Internet. The possibilities of interacting with health care systems are infinite (reminders by e-mail, electronic reminders, websites for self-monitoring of symptoms or treatment, etc.).

4. Publicity of the medical acts, and community assessment

In different societies, the knowledge of health care outcomes in medical institutions, and particularly of their morbimortality rate for procedures, is more and more required. New media in social networks will probably lead to greater publicity of individual medical acts, even in the doctor's office and the institutions. I am still surprised that a collective body of the community of medicine users to record their virtues and drawbacks from a daily life perspective has not been created yet. It is not difficult to imagine NGOs and networks of patients and users evaluating the system as a contribution to its improvement. (49, 50) Regarding this new trend, one of the editors of the BMJ, Fiona Goodle, recently wrote: "Doctor rating sites in their current form are not the answer, but nor can we resist the reformation's incoming tide. We serve patients and health care best by making health care accountable. This means putting our energies into ensuring that the public has reliable, objective, accessible data on doctors'performance, including how well they interact with patients." (51) A brave or foolhardy attitude, depending on how you see it.

5. Collective networks and the world of patients

In a previous letter, I discussed the difficulty in communication between the "world of diseases" defined by doctors and the "world of illness" of patients. The increasing participation of patients and their families in collective networks with greater knowledge and dialog is inevitable, and I think that, even with all the risks involved in the intimate dimension of the doctor-patient relationship, it will be a new instance of enrichment, mediated by the semantic Web.

THE PRODUCTION OF COMMUNITY MEDICAL INFORMATION

Universal prospective records, and the electronic medical record

Progressive migration to electronic forms of medical information files is mostly focused on health care or administrative aspects; so far, this migration has been somewhat limited to extract information that enables a deeper knowledge of the medical practice.

We usually meet in congresses and discuss the value of evidence-scientific test from clinical trials, compared with the records from practice. Arguments in one sense or the other are obvious: the trials are experimental models designed to reply "simple" questions (Is a double drug dose better than a conventional drug dose?) in selected healthcare contexts. In theory, records include all the patients, with no selection, and in that sense the "real world" practice is better reflected. However, the real world of medicine in most of the world is very different and combined, coexisting different medicines in the same societies or cities. This is the case of the records from scientific societies, which only include institutions of certain academic or motivational level; no international record has used sampling techniques to make population representative of the society being described. Many years ago, Gianni Tognoni proposed the idea that the true scenario for clinical research should be merged with health care practice, and that new forms of records will undoubtedly be the platform for this revolutionary modality to mature. Over the past three years, a low-cost local venture with modest aspirations, the computed epicrisis of the cardiac intensive care unit for permanent use in more than 40 national centers, has shown us the motivation to improve and share the file of its own practice, (52) which has already included more than 20,000 patients. The provision of assessment tools in medical practice can be crucial to assess the impact each behavior change produces on the progress of patients in the local environment, always unique and special.

Medical journals and new electronic forms

In the new model of electronic interaction between the scientific societies and the medical publications, it is necessary to include the possibilities offered by new computing resources and social networks.

1. Open-access online journals

Most of these journals, and the *Argentine Journal of Cardiology* in particular, are available online to readers, and have search engine systems suitable to find essays, topics, authors, etc. This had already been achieved in Web 1.0.

2. New formats of communication

Set of slides for the works, podcasts, vodcasts. This is simply to make more information with educational content accessible to "fast" or in-transit consumers. This is particularly suitable for brief and conceptual content.

3. Expanding the base of information producers

One of the problems of local scientific societies is the scarce production in research or its concentration

in very few institutions. It is possible that most of the information provided by journals –even by our journal– is currently restricted to one aspect of the medical knowledge, valuable, but non-exclusive. State-of-the-art journals like the BMJ have offered other opportunities to participate through personal blogs for member physicians, presentation of clinical cases, forum discussions. Perhaps the greatest challenge of this new phase may be understood by an "ideological" change: To expand the possibility that the rich human clinical experience of general practitioners or institutions can be recovered for the community through the presentation of clinical cases, complementary tests, in a sort of medical dialog using YouTube or Facebook. This is inserted into the content of the tree of knowledge: recognize the wisdom of colleagues, currently undervalued and wasted. Part of this will be the strategy adopted by the SAC: to open its website to tips and advice, and which could be complemented by opening it to the community, with adequate tools.

4. Development of instances of constant debate with medical news

In cardiology, the site TheHeart.org, now also in Spanish, has developed an intense task with the spread of new information, and debates on the specialty. Through a journalistic approach, it exposes the outcomes of new trials with therapeutic implications, together with interviews to their authors and their critics; it also includes special sections like "Thumb-Up and Thumb-Down", which presents a debate between Robert Califf and Robert Topol, recorded, and with slides. Dozens of medical journalists are sent to the main events. This journalistic approach has not yet been addressed by medical journals systematically, although *Lancet*, in particular, includes sections devoted to medical problems in the world. One of the greatest achievements would be to create instances of electronic exchange and constant debates about the recent news on the specialty through the SAC and its *Revista*.

5. Opening up to the journalistic community and the patients

If the means to be developed acquire enough frequency and consistency, they will undoubtedly be taken by the media to update the population. Medical information in high-circulation newspapers is generally scarce and questionnable, even though we have very good science journalists and supplements in Argentina. (53) Specialty patients might also have a place, and there are journals that already publish patients' opinions on their own cases or on family cases'.

6. Community production

So far, the medical wikis have not been as successful as Wikipedia and its predominance over the Encyclopedia Britannica. In medicine, the up-to-date form and other institutional or hierarchical forms predominate as sources of consultation. Necessarily, scientific wikis should require academic background, and should also be regulated. This issue has not yet found its way, and represents a major challenge in order to listen to all the voices of the problems to be analyzed.

CONCLUSIONS

In the spirit of this new possible phase, this text aims at showing concern and multiplying ideas in this field, which may contribute to a better medicine, from an ethics of enhancement of practitioners' knowledge, of patients' knowledge, and of all healthcare professionals' knowledge.

In Argentina, the brutal drawbacks in medicine usually set us aside the possibility of thinking about the issues that constitute the medicine and the society of this new century in all their dimensions. Problems in medicine are not "fixed" in other countries, not even in the hegemonic model of the United States, where there is currently an intense debate for universal health care coverage of a state-of-the-art and high-technology system, but with poor and inconsistent medical outcomes for the community. Of course socialized systems are ahead of our game, as well as others systems, which have done "well" during the 1990s reform –which has had disastrous results in our country. In this regard, Chile is an example, with a marked tendency towards the reduction of infant mortality, and rationality indices in health management which are much higher than ours.

The new forms of community participation invite us to a new community literacy. If an entertaining way to define culture is that of how to make people's ideas portable (in the case of language, tools, arts), the community challenge consists in how to take advantage of the open resources in order to improve our medicine and the health care for patients.

Piscitelli summarizes three acquisitions of the social software: cognitive exoskeletons (structured computing resources that help us search, think, classify, have access to information), mental-cognitive (changes in ourselves), and collaborative environments (social networks that facilitate exchange).

At a difficult time of scientific production, with consensus that we often doubt about, crossed by very consumerist or commercial interests and visions of medicine, and with the medical production mostly in the hands of industry, the need for an open and unbiased community participation in the debate is becoming increasingly necessary. So is also the provision of community areas for independent production of evidences, and adjusted to the real problems and deprivations of the population.

The proposal of the Argentine Society of Cardiology to expand its website could not be undertaken at a better time, and it will be the responsibility of all its members to consolidate it as an educational tool, for scientific production and dialog in the era of the virtual cyberspace.

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