

"I Found it on the Internet" Preparing for the e-patient in Oman

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"وجدته في الشبكة العنكبوتية الدولية" الإستعداد للمريض الإلكتروني في عمان

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الملخص: في عصر الإعلام تتغير سبل التواصل بين الطبيب والمريض . وباستخدام نظرية ايفيريت روجرز لانتشار الاختراعات ، تدرس هذه الورقة انتشار الشبكة العنكبوتية الدولية في عمان ، ويعد ذلك نأخذ بالحسبان ظهور المريض الإلكتروني . تم وصف المريض الإلكتروني بشيء من التفصيل . في نهاية الورقة نصف الخطوات التي يمكن اتخاذها عند تعليم طلبة كليات الطب في عمان من أجل أن يكونوا مهئين للمرضى الإلكترونيين .

مفتاح الكلمات : التعليم الطبي ، عمان ، نشر الاختراعات ، الشبكة العنكبوتية الدولية ، علاقات المريض – الطبيب ، التواصل .

ABSTRACT: In the Information Age, the communication patterns between doctor and patient are changing. Using Everett Rogers' theory of Diffusion of Innovations, this paper begins by examining the diffusion of the Internet in the world and in Oman. It then considers the emergence of e-patients. The characteristics of e-patients are described in some detail. The paper ends by describing steps that should be taken when teaching medical students in Oman so that they can be prepared for e-patients.

Keywords: Medical Education; Oman; Innovation Diffusion; Internet; World Wide Web; Physician-Patient Relationships; Communication

CONTRARY TO SOME STUDENTS' BELIEFS, medical and health sciences education is not aimed at educating students to pass their exams, but rather at educating students to become practising health professionals and critical life-long learners. Most importantly, we are educating students so that they can deliver high-quality health care to their patients.

Medical informatics in medical education is the component of student training concerned with equipping health professionals to deal with the impact of the information age in the provision of health care.

Health care professionals interested in medical informatics and its technology may combine their work in health care with their exploration of an ever-changing technology. This fascination with the technology, however, carries a danger; we may become so enthralled by the technology that we lose focus of its purpose. As Coiera noted more than 10

years ago, medical informatics is "as much about computers as cardiology is about stethoscopes".¹ In this light, the focus of medical informatics is not on the technology, but on its use in the delivery of quality health care to patients.

A crucial part of medical informatics in health care deals with the use of information technology in the sourcing and transmission of medical and other information between doctor and patient. There is a conventional view that the role of the health professional in medical information transfer is to have the medical knowledge (obtained from education, experience and a wide range of credible sources) to sift and sort the information and present it to the patient. Ideally, the information should be presented in a manner that makes it understandable to the patient, respecting their language and other needs.² Where procedures are required, consent that is truly informed can then be given.³ Although informed consent is considered important, implicit

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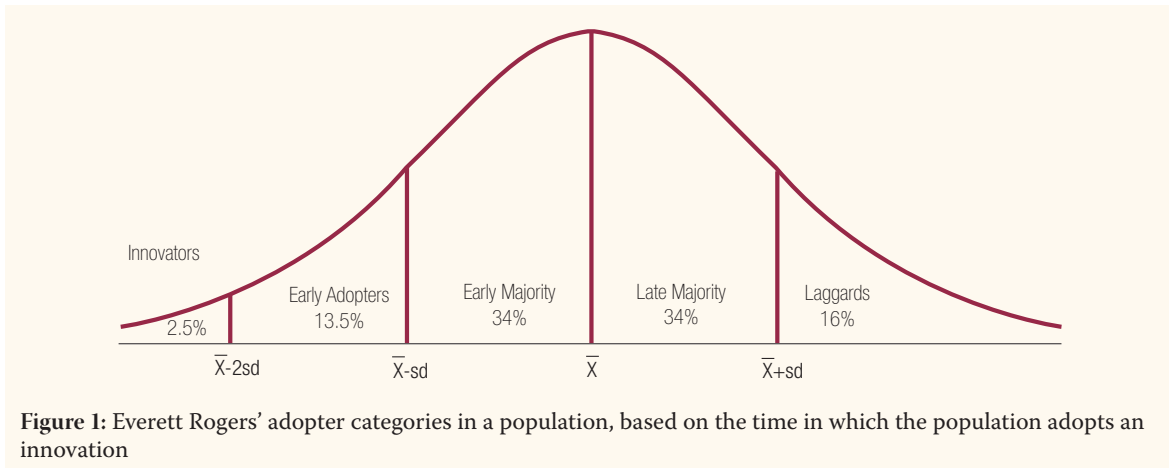


Figure 1: Everett Rogers' adopter categories in a population, based on the time in which the population adopts an innovation

in much of the writing on informed consent is that *the doctor informs and the patient consents*.

Even where this has been viewed as too paternalistic an attitude, the arguments for listening to the patient stop short of actually obtaining medical information from the patient. The philosophy is that the "physician brings research information about available treatments and their benefits and risks; the patient brings personal information about her or his illness, lifestyle, and values".³ If the patient armed with medical literature is considered, it is under the heading of the "difficult patient".⁴

This picture of medical information transfer is not accurate in the information age, and is daily becoming less so; health professionals who practice in this way will need to recognise that the role of information transfer is changing as a new kind of patient has arrived. S/he is called the "e-patient," and is sitting in consulting rooms right now. Many more will be in the consulting rooms of our students when they become doctors.

To understand better the phenomenon of the e-patient and the implications for Oman, this paper begins by examining the adoption of the Internet over the past decades viewed against the backdrop of Everett Rogers' theory of Diffusion of Innovations, and with particular reference to Internet usage in Oman. The paper will then describe the concept of the e-patient, examining some of the characteristics of the e-patient. Finally, the paper will discuss the implications of the information age for the training of medical students in Oman.

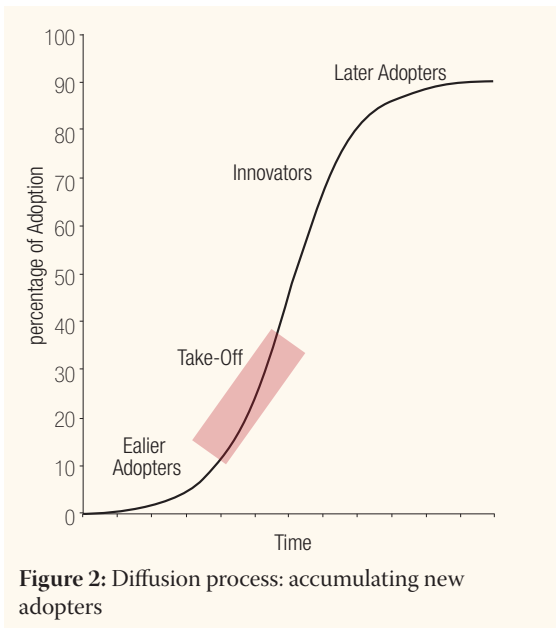
Adoption of an innovation over time – Rogers' Diffusion of Innovations

Future trends of any innovation, such as the Internet, can be better understood by viewing current and past growth in the context of Everett Rogers' theory of Diffusion of Innovations (DoI).⁵

In DoI theory, Rogers considers the demographic characteristics that encourage the diffusion (i.e. adoption) of an innovation throughout a population. In relation to the new innovation, DoI classifies the population of potential adopters into "adopter categories," and each classification contains a percentage of the population. These adopter categories are: 1) innovators (2.5%); 2) early adopters (13.5%); 3) early majority (34%); 4) late majority (34%); and 5) laggards (16%). Rogers shows this as a standard distribution curve as depicted in Figure 1.

Although several demographic characteristics play a role in determining the composition of the adopter categories, perhaps the most important is literacy and level of education, especially when they are associated with a corresponding increase in socio-economic status.⁵ An increased literacy and education level is associated with an increased rate of innovation adoption. The DoI theory also shows the accumulation of new adopters over time, as indicated in Figure 2.

Figure 2 shows a familiar S-curve. At some point in the adoption process, a 'critical mass' is reached. Critical mass is the stage of diffusion where enough of the population have accepted the innovation for the adoption to become self-sustaining. The critical mass point is not identical for each innovation,



although it appears to occur at approximately 10–25% of usage. Before critical mass, efforts at diffusion and development of the innovation are aimed at the early adopters and innovators who also serve as role models for the others. At the point of critical mass, the innovation is no longer seen as innovative, and is close to the norm with the benefits being observable. The innovation is then in a ‘take-off’ stage, and usage of the innovation spreads across the population.

Diffusion of Innovations and the Adoption of the Internet

Bearing in mind the descriptions given in DoI, we can now examine the growth of Internet usage across the world. The rapid growth in Internet usage is illustrated in Figure 3, which shows the increase in the number of Internet hosts since 1981.⁶ Of particular note in this chart is the change that occurred in the mid-1990s, when the impact of the World Wide Web was felt.

There has been a corresponding growth in the number of Internet users from 361 million in 2000 to 1.7 billion in 2009.⁷ A breakdown of those figures by region, is shown in Table 1.⁷

For the purposes of this paper, we should take note of the 48 million people in the Middle East, which, apart from Oceania/Australia, is the smallest group. These figures can be standardised as a

Table 1: Number of Internet users in the world by geographic region, in descending order of magnitude, in 2009

Region	Number (Millions)
Asia	704.2
Europe	402.4
North America	251.7
Latin America / Caribbean	175.8
Africa	65.9
Middle East	48.0
Oceania / Australia	20.8
Total	1,668.9

percentage of the population in each region [Table 2].

Shown as a percentage, some 24% of the population in the Middle East uses the Internet. At a deeper level, the percentage for Oman is statistically significantly lower than the rest of the Middle East ($P < 00.1$), at approximately 13.7%, or 469, 000 people.⁸ This percentage is a conservative estimate, and is based on an estimated 2009 Oman population of 3.42 million;⁸ other estimates put the 2009 Oman population at 2.85 million,⁹ which would mean that Internet penetration is approximately 16.5%, statistically significantly lower than the rest of the Middle East. To guard against over-inflation, we shall use the conservative estimate of 13.7%.

Although the number of Internet users in Oman is relative low, Figure 4 shows usage figures over time,^{8,10,11} and indicates that growth is proceeding at a rapid pace.

More importantly, Oman’s figure of 13.7%

Table 2: Percentage of the population that are Internet users in the world by geographic region, in descending order of magnitude, in 2009

Region	Total %
North America	73.9
Oceania / Australia	60.1
Europe	50.1
Latin America / Caribbean	30.0
Middle East	23.7
Asia	18.5
Africa	6.7

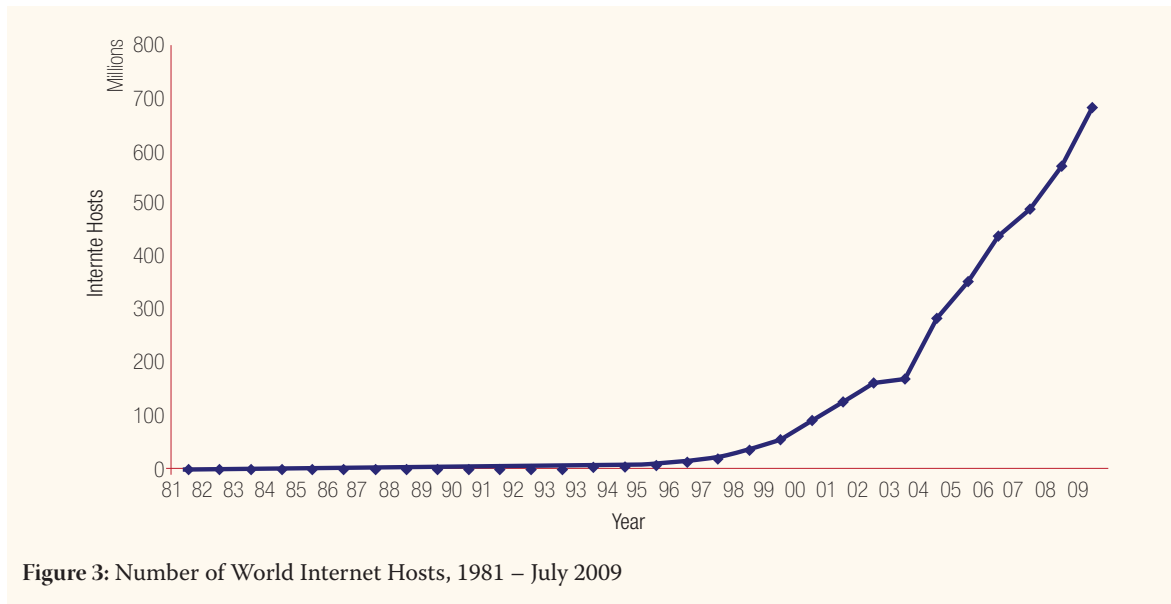


Figure 3: Number of World Internet Hosts, 1981 – July 2009

Internet usage places its usage in the late stage of Rogers' "early adopters" [Figures 1 and 2]. With DoI indicating that 'critical mass' is in the region of 10–25%, and Figure 4 indicating that growth shows no sign of decreasing in the short term, there is strong argument to support the contention that Oman's 'critical mass' either has been reached or will be reached within the next few years. It is reasonable to expect that Oman is into the take-off phase of Internet adoption [Figure 2], and that Internet adoption is about to increase at a more rapid rate. This expectation is further supported by DoI's argument associating levels of education and adoption of an innovation, and the fact that, since the 1970s, Oman has introduced widespread education programmes aimed and improving the overall educational levels of all citizens.

The Emergence and Characteristics of the 'e-patient'

In the context of Internet usage and Oman's expected future growth, we examine the concept of the 'e-patient'. The term 'e-patient' is constructed from the familiar 'e-' that is now part of e-mail, e-learning, e-banking, etc, and refers to the patient who uses the Internet as a health resource.¹² Before we can prepare our students (and current doctors) to function in the work environment in which their patients are e-patients, it is necessary to look at the typical characteristics of e-patients.

E-PATIENTS SEARCH INTERNET FOR HEALTH INFORMATION

The most important characteristic of e-patients is that they look on the Internet for information regarding their health. This should not come as a surprise, as it was foreseen by Tim Berners-Lee,¹³ the architect of the World Wide Web. The numbers of e-patients seeking health information around the world is unknown. Figure 5, however, shows the number of Americans who used the Internet to look for health-related information from 2001 to 2007,¹⁴⁻¹⁷ usually because of a "specific disease or medical problem."^{15,18} These figures represent as much as 80% of American Internet users,¹⁵ and is a marked increase from estimates of 55% in 2000.¹⁸ On any given day, more than 8 million Americans search for health-related information on the Internet.¹⁵

The reasons for e-patients' seeking information from the Internet are wide-ranging, including dissatisfaction with their health care providers' level of information, needing more confidence when talking to their doctor, or wanting to re-assure themselves of the information that their doctor has given them.^{18,19} Patients are frequently motivated by the fact that access to the information is convenient, that they can get more information from the Internet than from other sources, and that they can get it anonymously.¹⁸

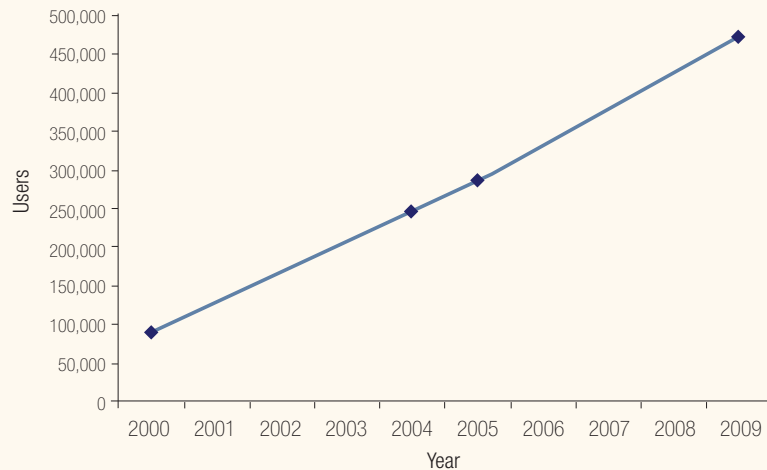


Figure 4: Number of Internet users in Oman, 2000–2009

E-PATIENTS MAKE DECISIONS BASED ON INTERNET INFORMATION

A second characteristic of e-patients is that they may make important decisions based on that information. In one study of those who sought health information on the Internet, as many as 70% made decisions about their health care based on what they found on the Internet. Comforting to health professionals is that some 50% made the decision to ask a doctor new questions or get a second opinion.^{15,18}

IMPACT ON PATIENT - DOCTOR RELATIONSHIP

It is at the point of contact between patient and doctor that the greatest impact of e-patients is noticeable; e-patients are being encouraged by changes in the patient-doctor relationship, and are, in turn, impacting on the patient-doctor relationship. To understand the impact on this relationship, one needs to consider the changing nature of health care delivery from a doctor-centred approach to an increasingly patient-centred approach in which the patient is viewed as a partner in the delivery of health care. Informed consent is no longer the gold standard, but rather an assumption, and the patient is increasingly taking a more active role in the management of the health care process.^{3,20-23}

Within this context, as e-patients becomes less reliant on doctors as the sole source of information, they will utilise the Internet as an alternative source of information. In addition to their using that information to make decisions, e-patients will bring

that information with them into the consultation. Earlier, reference was made to a conventional view of the doctor gathering information, sorting it and then presenting it to the patient in a manner in which it can be understood. It was also argued that this view is out-dated. International figures indicate that as many as 80–90% of doctors are reporting that some patients are bringing Internet material into the consulting room,²⁴ although the percentage of patients who do this is low. Doctors need to be prepared for better-informed patients while also being prepared to correct incorrect information.²⁵ Some recent works, while not explicitly addressing the issue, are arguing that a doctor must “encourage patients who have knowledge about their condition to use this when they are making decisions about their care.”²

The impact on the patient-doctor relationship is varied, but significant, and doctors’ reactions to this phenomenon are mixed. First, doctors fear that a patient with loads of information for discussion is a potential threat to one of their most valuable resources: time. Second, there are fears of confrontations with over-aggressive and misinformed patients, which would threaten to worsen the patient-doctor relationship.¹⁹ Conversely, many doctors report a richer experience in the consultation, and an improvement in the patient-doctor relationship.^{12,14,19, 26} In addition, while there are certainly dangers of patients’ seeking such information, there are many reports of patients receiving better information from the Internet than from their doctors, and even saving lives by

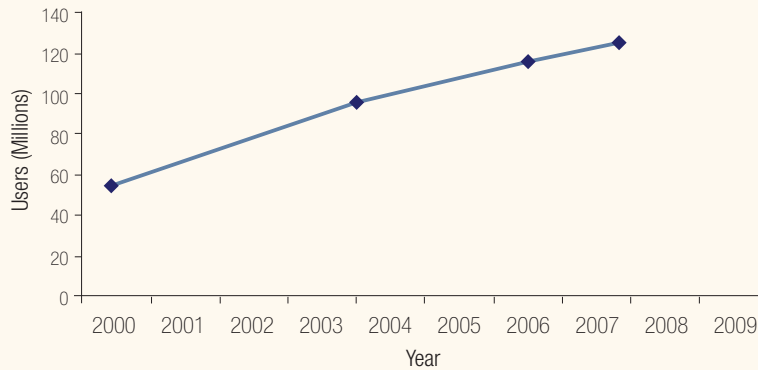


Figure 5: USA Internet users seeking health information online 2001–2009

following Internet advice.^{14,18,26,27}

Although patients bringing this information to the consulting room may be problematic, a worse scenario occurs when patients find this information, but do *not* tell their doctors. One study¹⁸ found that as many as 65% of patients who find information on the Internet do not discuss it with their doctors. While some of this is due to the fact that they are searching on behalf of someone else,¹⁸ frequently, they are keeping their own information to themselves because of negative feedback from their doctors. In many cases, if they have a choice, they move to another doctor.¹⁵ Preventing this scenario is discussed later in this paper.

E-PATIENT FOUND IN ALL DEMOGRAPHIC GROUPS

While differences in the percentages of e-patients across demographic groups exist, a point of consistency is that all population groups, whether viewed by age, gender, race or education level, are increasingly accessing the Internet; over the past 10 years, they have increased their use of the Internet for seeking health information.^{15,17,18} Differences by gender exist, and there is some indication that women tend to seek for health information more than men do; part of the reason might be that women are more likely than men to be looking for health information for children.¹⁸

Of particular importance is the use of the Internet by the youngest population groups. Global figures on Internet usage are difficult to obtain for patients aged below 18, but those that do exist indicate that the usage for people aged 10–18 is among the highest of the age groups in general.^{28–33} Some 93% of Americans aged 12–17 are online,²⁹

and other current figures indicate that, “with few exceptions, children (aged 5–14) and youth (aged 15–24) are much more likely to use computers and the Internet than the general population.”²⁸ Some studies indicate that these groups also search more for health information,^{34,35} although this is not always the case.¹⁸ While these figures have an impact for paediatricians and other doctors working with younger patients, many information seekers (as many as 30–50%) search for medical information on behalf of others, and this is likely to be the case with youth searching for information on behalf of their elders.^{12,14,15,17,18} This emphasises that it is not only paediatricians who need to note the use of the Internet; all ages will have access to it. This concentration of Internet usage by younger age groups is of particular significance to Oman, given Oman’s population statistics, showing that some 43% of Oman’s total population is below the age of 15 years.³⁶

E-PATIENTS EMPLOY RANGE OF INTERNET INFORMATION

The Internet is not a single and uniform mass, and the sources of information are wide. In some instances, patient sources will be the same as many of the doctors’, beginning with reputable medical journals, and including the many new online, open-access journals. While the quality of the material may be high, a problem is that many lay-people are not equipped to access and understand the information in a seeming confusion of methods, protocols, contradictory trials, or information that is outdated or inappropriate or masked by impenetrable medical jargon.¹⁵

There is also the problem of dubious information.

Most e-patients start their search with a general search engine,^{15,37} and may not have access to reputable and current journals. As much of the information on the Internet is uncontrolled, it may be wrong or dangerous, and patients do not usually verify the validity of sources; in one study, as few as 25% of e-patients checked information such as the source and date of the material they found.¹⁵ In addition, some of the material may be commercially motivated, although there is an indication that many e-patients are quick to recognise this, and generally shy away from these sites.¹⁴ Studies have indicated a correlation between doctors recommending sites and the number of patients bringing material to them.³⁸⁻⁴⁰ While recommending sites will lead to an increase in patients bringing information into the consultation, at least the doctor will have some control over the information, and will also be aware of the influences on the patients' thinking.

E-PATIENT USE INTERNET DISCUSSION GROUPS

Patients connect with other patients around the world who may be suffering from similar conditions and form electronic online support groups, social networks, or virtual communities. There is little suggestion that these groups are harmful, and several studies have found them to be useful to patients, especially those patients suffering from rare conditions, and where health professionals are scarce.^{19,26,27,41} In these discussion forums, patients are not only *consumers* of information, but also *producers*, with most of the information being produced by patients or lay-people working with patients. These e-patients also supply valuable research material, but the use of such material needs to be carefully guided by ethics.⁴²

E-PATIENTS EMAIL DOCTORS

E-patients will discover a doctor's email address and will use it. While some topics, such as the cancellation of an appointment, or requesting information about a foreign destination, may seem innocuous, enquiries about symptoms, new conditions, are not as easily discussed over email, and the impact on the patient-doctor relationship is a concern – as much as it was a concern when the telephone first started to be used by patients.¹² A large number (as much as 70%) of physicians report using email with patients, although the number of

patients is usually few (less than 5%²⁴), and this low figure corresponds with studies of patients.¹⁸

Email with patients raises many issues, including doctors missing facial cues, privacy and security (both in the doctor's office and in the patient's home), imposition (patients' expecting quick responses), time, re-imburement, and the doctors not being prepared to discuss some things in an email.⁴³⁻⁴⁵ Simultaneously, however, email offers the patient and the health professional the flexibility of asynchronous communication, the opportunity to reflect and give carefully-constructed questions and answers, further references to further resources, and also saves time on telephone calls.^{19,24,44,46-48}

E-PATIENT WANT ACCESS TO MEDICAL RECORDS

There are several debates about electronic medical records (EMRs), including the complexity of systems and costs. One crucial area is the degree to which patients have access to and ownership of their health records. The European Union's data directive (effective from 1998) enables all patients to have direct access to their own EMRs.⁴⁹ Other regions will have laws (which may be changing) regarding patients' access to EMRs, and doctors need to be aware of these.

E-PATIENTS LIKE ELECTRONIC DEVICES

More patients are becoming comfortable with using electronic devices at home (for activities such as testing blood-glucose and blood-pressure levels), and recording these online for health personnel to access, rather than patients' coming into the hospital or clinic. The long term benefits of complex systems, however, are not always clear-cut.⁵⁰

E-PATIENTS RATES DOCTOR

The last characteristic of e-patients is one that many may not have considered. Because doctors have used the Internet, they have 'digital footprints.' They may have a webpage, may have published in journals that have the articles online, may have a presence in Facebook,⁵¹ Twitter, discussion lists and groups, or any number of other sites. Much of this information is available to their patients who can look it up, and find out more about their doctors than their doctors may know about them. One study in 2000,¹⁸ found that 9% of e-patients looked for information about

specific doctors, hospitals or medicines. By 2006, a similar study found that 29% of e-patients had looked for information about specific doctors or hospitals.¹⁵ Not only can e-patients *find information* about their doctors, e-patients can *contribute information* about their doctors. There are hundreds of "Rate your doctor" websites, and many of the ratings and comments can be posted anonymously by patients. Examples of these sites include *RateMDs.com* (<http://www.ratemds.com/>), *RateMyMD.ca* (<http://www.ratemymd.ca/>), *DrScore* (<http://www.drscore.com/>), and *Vitals* (<http://www.vitals.com/>). While these sites may be fruitful to the doctor (for advertising purposes), the potential for abuse by patients is obvious, but perhaps less obvious is the potential for abuse by competing doctors or others.

Preparing Today's Students for e-patients

Thus far, this paper has established e-patients as a reality, and has described their characteristics. The question now remains – what can we do in Oman to prepare current medical students as they train to become practising professionals?

We begin with an attitude change. We need to recognise that there is another side to the information age to which our students must be exposed. We need to continue to teach students how to use the range of office, communication, learning, statistical, referencing and medical computer packages, and many other applications deemed important. Medical informatics, however, is not a distraction or just for the fascinated, or a separate convenience bolted on to students' courses, to be forgotten once they are practicing professionals. Just as their training in anatomy, physiology, chemistry, pharmacology, pathology, etc. all have a bearing on their interaction with their patients, so too, what they have learnt about medical informatics will impact on their interaction with, and health care delivery to, patients.

With this in mind, we need to acknowledge the existence of e-patients, and train our students to cope with this phenomenon. The e-patient numbers cited in this paper are from a few places in the world only, chiefly the USA. While these serve as useful guides, it is difficult to make hard decisions for Oman based on these figures. As a result, Oman will need to conduct similar studies of patients and

health professionals, regarding e-patients in Oman. Although Internet usage is comparatively low, DoI predicts that we stand on a cusp, and to delay such a study will result in challenges to our doctors that will threaten to compromise the delivery of health care in Oman. Among other things, we need to know the number of e-patients, the demographics, and the patterns of usage. In the meantime, we can prepare our students for what they will encounter when they are practising doctors. In this section, we revisit the characteristics discussed in the previous section (sometimes combining more than one where appropriate), and suggest strategies for meeting the new situation created by the e-patient.

As far as looking for health information on the Internet is concerned, students should be taught how to:

1. Elicit from patients their methods of finding information, and whether or not they use the Internet;
2. Search for, identify and select sites appropriate to their patients' conditions and situations, and guide their patients to those sites;
3. Use standards and other tools, such as Health on the Net at <http://www.hon.ch/Honcode/>, that can help them to help their patients;
4. Explain, or point patients to explanations of research methodologies to allow patients to navigate through some of the seeming contradictions and complexities;
5. Be open to new sites found by patients, and to advise patients on assessing some types of information, practising basic strategies like looking for the source. A good starting point is the CREDIBLE system;⁵²
6. Encourage their patients to involve themselves in the decision-making process, but deal with the inevitable problems of self-diagnosis;

Some of these suggestions will require extra work, and the doctor will need to judge the necessity of the short-term demand on time against perceived long-term benefits. This will depend mostly on the doctor's situation and the nature of the patients; Regarding the impact of Internet use on the patient-doctor relationship, students need to be:

1. Alerted to the role that the Internet will play in their patients' lives;

2. Aware of the positive and negative impact that the use of the Internet by patients may have on their relationship with them;
3. Aware of, and avoid, the risks (including of patients' moving to other doctors) of dismissing the Internet as a source of patient information;
4. Taught methods to deal with the situations where they feel they are arguing against the whole Internet;
5. Students need to be aware that, although Internet usage may be greater by younger and more literate patients, doctors cannot make assumptions about patients' Internet usage or contact with Internet information based solely demographic indicators. Patients will have access to the Internet by proxy.

With respect to Internet medical discussion groups, students need to be:

1. Aware of the existence and value of discussion group sites, both to their own patients, and to understanding perceptions and problems of the conditions in general. These are valuable for both patients and for health care research sources, but suitability and ethical issues must be understood;
2. Coached in the possibilities and methods of contributing to these sites, where they can share their medical expertise.

To prepare for the possibility of email correspondence with their patients, students need to be

1. Aware of the reality of patient-provider electronic communication, and how to set boundaries, limits and expectations so that the value of such communication can be experienced without compromising the delivery of health care;
2. Trained in written communication with patients;
3. Trained to deal with issues of online security, privacy and liability;
4. Trained how to advise patients (even if in the form of a short advice sheet) about issues of security and privacy.

To meet the issue of patients wanting to view and

update their EMRs, students need to be aware of the laws governing patients' access to their EMRs and the situation in which, in effect, the patient is looking over their shoulder as they write the medical record. Doctors' reports and comments need to be adjusted to this situation. In particular, short-hand notations, off the cuff writings, or information that may have been kept confidential between health care professionals may now be known to the patient. Students also need to be taught how to coach patients on the best and most appropriate use of electronic health devices, including when not to use them.

Given that e-patients may search for and rate doctors via the internet, students need to be:

1. Guarded about personal information, especially information about their behaviour during student days, that they place online;
2. Aware that too much perfectly appropriate information may tempt patients to cross the boundary from professional to personal relationships;
3. Prepared to browse for such rating sites, and take corrective action if they deem it necessary;
4. Aware that becoming the best doctor possible, should always be their guiding principle, and, in the current era of e-patients, the doctor's best defence.

Conclusion

This paper has situated its argument in the context of a changing approach to doctor-patient communication, and the diffusion of the Internet, with particular reference to the diffusion of the Internet in Oman. Using Everett Rogers' theory of Diffusion of Innovations, we have argued that diffusion of the Internet in Oman is set to increase dramatically within the next few years. These developments have been viewed in the light of the emergence of e-patients. The characteristics of e-patients have been described, with reference to international studies.

Both theory and international studies have pointed to a need to prepare current medical students in Oman to deal with e-patients, and this paper has outlined some strategies that should

be followed when training medical students to practice in Oman. It is our belief that a programme addressing these should be implemented as soon as is possible, so that future doctors in Oman can be better prepared to utilise all aspects of the information age to deliver high quality health care to their patients.

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