

Class Project for Oregon Health and Sciences University  
Introduction to BioMedical Informatics w/ Dr. Hersh

**Title:**

Asynchronous Communication between Patients and Physicians – Current Themes

A survey of current literature as an introduction to the topic. BMI 510

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**Authors and Affiliations**

John Norris

john-norris.net

**Abstract:**

Reviewing 10 recent, highly cited papers, as well as other works, we note the issues surrounding asynchronous patient physician communication. While healthcare has dealt with this sort of communication in the past, new modes of asynchronous communication (the Internet) offer advantages. Patients gain access to information, are empowered, and have alternative ways of expression and understanding that have not been available in the past. Clinicians have the opportunity to communicate more clearly, efficiently, and with greater convenience. All this is tempered by security, fiscal issues, changes in workload, and possible loss of communication. While it is still too early to tell about the efficacy of this type of communication in general,(28) it is not too early to put begin to elucidate its issues and start to build that which has a promising future.

**Introduction:**

The need for patients and clinicians to communicate is vitally important. However, there seems to be less time to properly do so during a face-to-face visit.(45, 61, (11, 5, 35 cited in 20))

With the advent of email, text messaging, web based input forms, and the like, patient and physician have more ways to communicate to one another. These messages are different from the immediate, give-and-take of typical conversation. These new mediums of communication include time latency. Conversations can pause for long periods. Further, their exchange provides little linear structure and so can become one-sided, and jump around from subject to subject. This type of patient/physician communication is asynchronous.

Asynchronous communication is not new to the field of healthcare. During the 17th and 18th century physicians could not travel great distances, so much of the diagnosis was done with letters. It was not until the advent of the telephone that synchronous medical communication became an option for many.(53) However, even with the telephone, one may find oneself leaving and responding to messages in an asynchronous manner. Given this long history, healthcare seems to be well poised to address these new modes of communication. Indeed, many already know what they need and want.(51)

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In looking at the current literature, we find both the pros and cons of asynchronous communication. We see how communication mediums that allow for asynchronous communication fit into the healthcare environment. Currently, there are no authoritative studies concerning the efficacy of these mediums in general (28), but there are many possibilities that may bring positive contributions.

In this paper we will look into patient physician asynchronous communication in order to understand its issues and possible future directions.

### **Methods:**

In order to review the current thinking on this area, I attempted to find the current, highly cited, papers on the topic. I created a list of likely papers, noted the number each was cited, and chose the top 10 which addressed this subject.

On November 7, 2006, I searched Google Scholar, and PubMed for papers published since 2001 that had the set of words: "asynchronous", "communication", and "physician". Google Scholar returned with 1,280 links in which I noted the first 100. PubMed returned 18 references. Dr Bill Hersh provided his list of references used in the appropriate unit of his Introduction to Biomedical Informatics course. (27) I added those articles to the ones from Google and PubMed..

Using Google Scholar, on November 7, 2006, I noted the number of citations each of the articles had, and came up with the ten articles that had the most citations. (Most citations first: 20, 34, 30, 29, 32, 13, 14, 39, 45, 33) I used these ten articles as an entry into this topic. I read them and pursued their references. As I gained understanding, I searched out other articles on the topic. The class text (52) and a class handout (28) gave me further information.

I should note one difficulty in this method. This method tends toward less recently published articles, those that had the time to be cited more often. Given the field is rapidly changing; this could lead me away from new issues and answers.

### **Results:**

The literature addresses a variety of issues but several themes emerged. Seeing how the literature addressed these themes, one may come to an understanding of the issues involved in asynchronous communication between patient and physician.

#### *Patient are not getting all the information they need*

Much of the literature addresses with the need to get more information to the patient. There are few opportunities for patients to share information.(45) Physicians don't understand the patient's true desire for more communication.(61) Patients want more information from their physicians than they receive.(31, 63 cited in 20) Physicians spend less than 5% of the visit discussing planning and treatment.(61 cited in 120) Totally informed decisions are a rare occurrence.(11, 5 cited in 20) While there is some concern that more information may be detrimental to the patient, this is not necessarily the case. (19)

#### *Patient Inequality and Empowerment*

To have true patient education the information needs to flow both ways.(31) Physicians have been found to control the conversation, not allowing patients to communicate their world.(61) Patients who do not

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understand something will often not ask, as they do not want to bother the physician.(33) Patients may not be forward enough to counter a more domineering physician.(63) Indeed, patients in the past were even expecting and expected to take a less active role.(52 pp 534-535) However, patients that feel they did not get adequate information may find other avenues to acquire it.(22)

Messages, alternatives to face-to-face encounters, offer ways to help the patient and doctor get around these inequalities. Patients may feel more comfortable discussing awkward issues outside of face-to-face encounters.(13, 9) Patients that are put off by an office environment are more effusive in a different environment where they can compose messages.(53) The ability for the patient to be semi- or completely anonymous may be an advantage.(13, 45, 22) The informality of electronic communication also gets by some of these barriers.(45) Although seemingly impersonal, electronic surveys have been shown to get more sensitive and complete answers than face to face communication.(58, 2 cited in 45) There is also a suggestion that email may help in the communication resolutions of old problems which the patient would not have reported to the doctor.(29)

### *Misunderstanding*

Difficulties in communication are exacerbated by socioeconomic, cultural differences. (4, 3 cited in 20) Misunderstanding because of these cultural issues may not be overt and easily identified. Misunderstanding may be subtle as both patient and physician are “doing the best they can.”(18) Communication between two cultures can be eased by including the use of interrupters and extra time for cultural competency.(10 cited in 4) Electronic messages can be created to account for deafness, illiteracy, and special needs.(2) I would think that asynchronous communication might allow for extra effort to address socioeconomic and cultural differences. Messages that include videos illustrating certain therapies would help alleviate misunderstanding.(36 cited in 33) However, some patients feel that using the phone is easier than explaining the issue in writing.(34)

### *Errors/Recall*

Asynchronous communication, such as email, depends on message that are created in a format that can be delivered. This may allow them to be kept for multiple views later. This is important as patients can not easily recall certain information.(35) Email allows one to keep a record of the information.(43 cited in 50) As the amount of information gets larger, synchronous formats, such as the telephone, allow errors to occur.(50) To help assure, and document, that there is understanding, information in writing is important, especially in areas of informed consent.(35)

### *Adherence*

The ease of reporting, allowing more and better contacts between patient and physician, can be used to keep patients on their medical regimes.(18 cited in 13) Requesting patients submit videos of their range-of-motion provides motivation to keep at their exercises. (33) Readings from biosensor instruments at home help keep the patient on track.(33)

Reminders for patients to take their medication help with adherence.(33) Messages can be sent at a particular time and request a quick response to help assure adherence.(3) While such back and forth of messages could occur quickly enough to seem synchronous, that is only in the delivery, as the messages could have been created and scheduled at another time.(3)

Reminders and sensors help with adherence, however, simply educating the patient helps remain on therapies.(19) Asynchronous messaging can help with this as well.

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### *Sharing with others.*

Sometimes a concerned friend may want to assist in one's health care.(22) People close to the patient have used email to bring up to the attention of the physician that were too sensitive for the patient to mention.(13) Discussions with other people may create more questions from the patient(20) and help alleviate misunderstandings.

In some cultures it is important for other members of the family to be involved in the situation.(20, 7) Messages allow others to share the information and discuss it with each other to more fully understand it.(20, 45)

However, the patient may not want certain people to know. Email accounts may be shared at home, and email may be monitored in business.(17 cited in 9) Physicians should be sure patients understand there are other means of communication, find out the patient's wishes, and make sure the patient understands the issues.(9)

### *Message Content ... what is being sent, or not*

Most messages currently in email are non-urgent.(29) Reported content includes, medication refills, obtaining test results, making appointments,(15 cited in 34) issues about work and school, addressing misunderstandings, requests for current research information, advice on chronic care,(45) billing, referrals,(29) sending biosensor information, getting tests done before a visit and pre-visit information gathering.(13) Almost half the information requested in some situations does not have to be answered by a physician.(62, 22)

Patients preferred office visits when the issue seemed more serious such as, abnormal screening, and sensitive results.(29) Most patients do not send urgent messages.(62) Most physicians do not believe email should be used in emergency situations, but a few said it has helped.(13)

Most physicians believe email should not be used to evaluate a new symptom.(23)

Video content is also sent.(36 cited in 33) While synchronous video transmission is possible, asynchronous video is more convenient (33) and allows for many of the aspects discussed here.

On a cautionary note, incorrect data transmission has also been occurred between systems (6) ...although not explicitly patient/physician email. (JN)

### *Web Messaging...Alternative to email*

Instead of using email, where the message is sent over the Internet, one can go to a web site to pick up and leave messages. Web messages do not need to go over the general Internet. They can be accessed via most modern web browsers which include encryption.(47 cited in 4) Web messages are can be protected by having the patient or physician log in with an ID and password.(33)

Instead of the free text orientation of email, web sites can include forms to fill out, allowing for structured text. Patients can be given structured questionnaires (33, 41 cited in 34) and their physician can view them.(33) Thus, questions for the patient are developed beforehand, and possible answers standardized. While seeming impersonal, self assessment forms have been shown to be helpful as it saves the physicians time and allows them to see issues from the patients' point of view. (36)

Despite these new forms, much of electronic communication between patient and physician is still via email (29)

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### *Response Time.*

While part of asynchronous communication lies in the ability for it to be processed at a later time, taking too much time for a response can be a problem. Patients are cautious about using this technology because of possible slow response times.(54, 41 cited in 34, 29, 42) We noted earlier that email is not for emergency situations. Even with non-urgent email, physicians are concerned that they may not get the email, that it would be simply lost.(13, 41) However, the concern seems to be greater than the actual occurrence.(13)

Patients' expectation for response time varies with the clinical service, but most expect a reply with 24 hours (34, 16) or 48 hours.(13 cited in 34) Patients that need a quick response use the phone.(34) Response time should be a matter of policy(13) in order to set expectations. It is also important to have an auto-reply to let patients know the message was received into the system.(54)

### *Security and Privacy*

Because asynchronous messages are stored, are at some stage in a presentable format, and may travel between systems, they may be accessed by unauthorized people.

Messages can be seen by others. Unencrypted email may be intercepted, shared computers and people simply looking at the screen can breach one's privacy.(34)

Messages can be forged, so clinicians should be sure that others cannot send out messages under their name. Further, they need to know that the patient the person they are supposed to be working with. A digital signature, or other authentication, could be used.(53) A complete audit trail should be available, including authenticity of the creator and receiver, possible changes, timestamps as well as verifying the veracity of the submission, delivery, and receipt processes.(40)

Web messaging sites can use 128 bit encryption to prevent access to the user's information.(47 cited in 34). In the case of web messaging and other uses of web servers, web server analysis information also needs to be protected.(53)

There are many areas of possible fraud and abuse, but all communication technologies have issues, as well as face-to-face encounters.(21 cited in 53)

### *Ease of use causes Physicians to Fear Inundation*

Some physicians believe email will increase their work.(30) However, some find it is not too time consuming.(64 cited in 45) Many physicians understand the convenience of answering email.(13) The use of a triage system for email might help mitigate the burden. (13)

### *Triage and Workflow.*

Instead of messages going directly to a single recipient who would answer it, messages can be routed to any number of people who can then answer as appropriate. Since the message is asynchronous, their priority and recipient can be managed by triage or workflow system.

Messages can be all sent to a single account then routed to the appropriate person. (34, 29, 37) Savings can be realized because some processes need to go to more than one person at the same time.(45) Web messages, can have a structured text via forms, and then have automated rules to route them to the right person.(34, 47 cited in 34, 38) These web forms may also route emergency messages for immediate follow-up.(38)

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With proper work flow, physicians can respond just to the messages that required a physician's response.(29) Further, physicians who prefer not to communicate to patients directly through email can have their staff do it instead.(30) While many physicians are fine with their staff answering messages, and many preferred the staff to see them first, many patients felt the messages should be more in the purview of the physician.(29) However, others have found no correlation between patient satisfaction, and who actually answers the email.(54)

Triage and workflow systems must allow for access only by the appropriate people.(47 cited in 34)

The workflow and routing of email must also fit into the typical day of the physician.(12)

### *Convenience*

By not being limited in place and time, asynchronous communication allows for certain flexibilities. Traveling for a visit or scheduling phone calls are inconvenient enough that they prevent the patient from getting more frequent attention, and thus lesser quality care.(33) With messages, non-urgent matters can be given lesser priority, but still be addressed, allowing for continuity of care.(13) Communication can take place after hours (6) or when either party is out of the area.(33) However, a physician needs to be careful not to give guidance without knowing if their license and the law allows them to practice in that remote location, E. G. out of state.(53)

### *The Practice of Medicine*

With more and more asynchronous communication being used in healthcare, the day to day practice of doing healthcare may change. Physicians may need to learn to work within and become masters of management systems and systems development and thinking. Clinical skills will be closely linked with communication skills.(32) In the future, physicians will be involved in many patients simultaneously.(28p 534) Physicians may need to get used to being reminded electronically about things such as unanswered email.(33)

The benefits of these technologies will empower patients.(32) There will be a shift from physicians in being in a teaching mode to one more of assisting and motivation.(60)

However, optimal care may not just be patients reviewing or following instructions on a website, but will involve more contact, E.G. weekly follow-ups.(57)

Much of this may be in the further future, for some organizations, there are problems just integrating email into existing medical records and clinical databases.(29)

### *Considered Response*

Email may allow one to look up answers for surprising patient questions, find out histories for lesser known patients, and provides a buffer to re-think improper retorts.(26) One might have the time to construct a proper message than when face –to-face or on the phone.(9, 53) Time can be taken to more carefully bridge cultural considerations. The use of interpreters and those skilled in cultural issues should be employed to help communication.(10 cited in 4)

### *Include additional resources*

Because of the flexibility allowed for a response, one can find, reference, and even more easily present additional resources within the message. Patient recall can be poor.(48) Simply having the information in a form one can refer back to is a resource in itself.(35) Most people do read and keep educational material given by a physician.(43) These resource can be given out to many people at the same time.(45)

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Other resources may include educational web sites, hand-outs, personal instruction, information from colleagues, as well as other information such as follow-up appointments. (20, 32, 45, 33) Websites that one would visit for web messaging can also include educational materials, (34) ability to schedule, questionnaires about medical concerns, and links to other web sites. (53)

Physicians are tasked with finding out what the patient needs and wants to know, and then providing that to the patient in the proper amount, detail and at the best time. (31) With greater ability to convey more information, in some way, the task becomes greater.

There are several other resources types mentioned. One can easily be able to upload and view video. (33) Decision aids, where one is guided through a decision process, (20) are another possible resource. (44 cited in 34) This is especially important as physicians may not take the time to fully discuss decisions. (59) Complete interactive systems can be put into place to help educate and support patients. (44 cited in 34).

However, it is not enough to just provide the information and expect patients to adhere to a medical therapy, contact with the therapist, among other things, gives more promising results. (57) Website programs may not do as well as face-to-face programs. (33)

There needs to be a bit of caution when linking to other sites, as there, may be antitrust, kickback, and self referral issues. (53)

### *Guidelines / Policy*

Technology alone can not make sure technology is used properly. (53) Proper guidelines should be followed. When given guidelines, patients do adhere to them. (62) However, physicians may not be operating with proper guidelines for message use. (13, 12, 23)

There are no international standards or enforcement for tele-medical care. There have been few, or no, lawsuits. (55)

Because of the risks of remote care, there is the idea that remote care's standards should be higher. (46)

### *Documentation*

Email is better than phone (34, 50) and face-to-face communication (30) in that it is self-documenting. (17 cited in 30). It is also easier to read than hand written notes. (45)

Email should be retained (8 cited in 57) and may help in malpractice suits. (53)

However, if there is not a good process for including email in the patient record, these messages may not be documented well. (13, 12)

### *Reimbursement*

While face-to-face interactions are reimbursed, other communication is not. (60) Not being paid for work done via email is a major concern for physicians. (23) This is preventing more physicians from using email (12)

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### *Feelings about email communication*

Physicians (General Internists) value close personal connection with their patients.(49, 65, 25 cited in 32) Physicians find that email can help maintain communication with patients, and patients feel more of a one on one relationship with the physician.(13)

Physicians are satisfied with email communication with patients.(23) Many physicians feel their overall communication was at least better when they used email.(34)

However, patients may still preferred face-to-face or phone communication for some issues.(29)

New technologies such as email will enhance but not replace interpersonal contacts between patient and physician.(38) Indeed, the AMA Code of Ethics states that email should enhance more personal contacts.(1)

### **Discussion**

This paper is an attempt at understanding the various issues surrounding asynchronous communication between doctor and patient. As such, much of the effort and material is presented in *Results*. However, during the research, as various themes and their details emerged, I came to wonder about additional issues.

Email, and web messaging, was frequent topics for patient/physician asynchronous communication literature. They are, after all, new technologies with great promise. I was surprised I did not find more information on older forms of patient/physician asynchronous communication that have been given new life with modern technology. Voice over IP, with its ability to parse audio such as the telephone, and connect to databases was not mentioned. Optical character recognition that can allow written text to be processed digitally was absent. Even the flexibility for communicating over longer distances allowing for outsourcing was not addressed.

As triage and work flow systems become more automated, and similarly decision aids and applications that serve individualized educational material, it will be interesting to see if the FDA becomes involved. Some of these systems seem may begin to go beyond the “general accounting or communication functions” that are not subject to FDA regulation. (6)

Patients and physicians can misunderstand each other for a variety of reasons. For example, they may have different meanings for the same word.(56, cited in 20) Will email help cure this issue, or cause it to worsen? Without the give and take of synchronous communication, differences in meaning may not be quickly recognized and dealt with before they cause greater misunderstanding. I hope that the ability for great consideration will allow it to happen less.

I was a bit surprised to read that many physicians may not be operating with proper guidelines for message use.(13, 12, 23) I'd think that this is normally a fairly cautious group. However, I suppose the benefits of messaging are almost immediate, and the problems do not occur until later, or are hard to fully comprehend before hand. I suspect guideline compliance will be much greater in the future.

I was also a bit surprise to hear that given guidelines, patients do adhere to them.(62) I would have thought that the ease of access to physicians and the casual medium of email, there would be more problems. I wonder if it is the deference, or submissiveness, that patients are accustom to giving to

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physicians. I hope that as patients become more empowered, and the relationship with physicians change, they will still communicate with appropriate manners.

Being able to respond to patients within 24 hours may be a challenge. If some patients are satisfied with others answering their email (67) it may be because much of the content is non-urgent, or issues traditionally handled by staff. As that content is further handled by automated or self-help processes, email actually sent to the physician may require that higher level of attention. Once patients understand they can actually communicate with a physician about those issues, will there be the inundation that physicians fear?

While asynchronous communication between physician and patient allows for many possibilities not available to synchronous communication. I understand that there are some aspects of synchronous communication, (and further face-to-face communication) that asynchronous communication lacks. There will be cases where these more intimate aspects will need to be addressed, and that can only happen when two people are together.

### Conclusion

Asynchronous communication between physician and patient has been going on with various technologies for many years. Current Internet technologies such as email and web messages have allowed this form of communication to become more accessible and given it new possibilities. It has also caused problems. By understanding the variety and scope of current asynchronous communication between patient and physician, we can build on the opportunities and address the problems.

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