Computers in the new consultation: within the first minute

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Background. Computers are now commonplace in the general practice consultation in many countries and literature is beginning to appear that describes the effects of this presence on the doctor–patient relationship. Concepts such as patient centredness emphasize the importance of this relationship to patient outcomes, yet the presence of the computer has introduced another partner to that relationship.

Objective. To describe the patient–doctor–computer relationship during the opening period of the consultation.

Methods. Twenty GPs provided 141 consultations for direct observation, using digital video. Consultations were analysed according to Goffman’s dramaturgical methodology.

Results. Openings could be described as doctor, patient or computer openings, according to the source of initial influence on the consultation. Specific behaviours can be described within those three categories.

Conclusions. The presence of the computer has changed the beginning of the consultation. Where once only two actors needed to perform their roles, now three interact in differing ways. Information comes from many sources, and behaviour responds accordingly. Future studies of the consultation need to take into account the impact of the computer in shaping how the consultation flows and the information needs of all participants.

Keywords. Physician–patient relationship, medical informatics, office visits, computers, qualitative research.

Introduction

General practice has a long history of emphasizing the importance of the doctor–patient relationship, particularly on satisfaction and outcomes.\textsuperscript{1–3} The impact of the computer on this delicate relationship is increasingly in question.\textsuperscript{4,5} The future involves greater computerization of the clinical encounter,\textsuperscript{5} yet the introduction of computers has been shown to change the interaction, with GPs now spending time looking at the screen and missing some patient cues.\textsuperscript{7} The computer is now an integral part of the consultation, and the contemporary doctor–patient relationship is a triadic one.\textsuperscript{8} Recent work has shown some specific behaviours that doctors exhibit during the computerized consultation.\textsuperscript{9,10}

The purpose of this paper is to take a specific and vital part of the consultation—its beginning—and examine this triadic relationship. The study is based in Australia, where 90% of GPs have a computer on their desktop,\textsuperscript{11} a penetration matched only by the UK.\textsuperscript{12}

General practice training emphasizes the importance of the initial interaction with the patient in creating a personal connection. It is also during this period that the ‘reason for encounter’ (RFE) or the presenting problem usually becomes manifest. The term ‘RFE’ comes from a recognition that the initial interaction is a complex time.\textsuperscript{13} Patients do not present with a disease or a diagnosis; they present with a problem. That problem may manifest as a physical symptom—‘I’ve come about my headaches’, an administrative issue—‘I need a renewal of my certificate’,
a completely undifferentiated perception—‘I just don’t feel quite right’ or any number of other ways. The stated RFE may not be the real reason for presenting; it might serve as a ticket of entry to a consultation where, for example, the stated RFE is for a respiratory infection but the majority of the consultation is spent discussing marital difficulties. The opening sequences of the consultation are a natural and sequential environment through which the actors move from the ‘preliminaries’ to ‘talk on topic’.13

Patient centredness emphasizes that doctors should ask open-ended questions and allow time for the patient to respond. Despite this, interruptions to patient speech and the flow of the interaction are still common and often involve the computer.14 The importance of these small pieces of interaction that occur at the beginning of the consultation rests in establishing rapport and elucidating the reason for the patient’s attendance,15 and can be crucial in creating patient satisfaction with the consultation.16 In summary, the doctor and patient establish (or re-establish, in the case of a regular patient) a relationship and reinforce the purpose for the relationship within the context of that specific consultation. This first minute is shaped by many factors: the patient’s familiarity with the setting and doctor, the nature of their problem (acute or chronic, obvious or undifferentiated, simple or complex) and the new influence of prompts generated by the computer, for instance.

Methods

Using divisions of general practice,17 we were able to target GPs who were significant computer users—defined as using clinical software for progress notes as well as for prescribing and test ordering. Twenty GPs each videotaped a single consulting session, generating 141 consultations for coding. A further 32 consultations were lost due to technical difficulties and 17 due to patient refusal. Non-consenting patients tended to be female and often requiring an intimate examination. This refusal rate is lower than what has been previously reported.18 Ethics approval was granted by the University of Melbourne Human Research Ethics Committee.

Each consultation was then transferred to digital format on an Apple Macintosh computer, which allowed the researchers to tag specific microactions (gaze direction, etc.) in the videos as well as observing the flow of the consultation.19 This tagging allowed sequential viewing of individual consultations, as well as comparisons across consultations. The methodology for analysis was a dramaturgical framework (after Goffman).20 Dramaturgy analyses the consultation as though it was a dramatic play, where the consulting room is the stage and the participants are actors, playing a role. In observational studies, this method has the benefit of removing the need to understand the internal perspective of the actor—it is more important how the other actors respond, and how the audience perceives the performance.

Dramaturgy was supplemented by using hermeneutics. Hermeneutics is simply a method of relating ‘the part to the whole, and the whole to the part21 and relates to the circular process of reading the data (in this case videos) at a macrolevel, then applying a preliminary framework to the microbehaviours and then revisiting the macro.22 Using hermeneutics, on the first pass a framework of the overarching styles was developed. The application of the developed styles was then tested by a second researcher reviewing the videos. Adjustments were then made to the framework—in this case, three styles for doctor and computer were conflated to two. A similar process was undertaken with the behaviours. The framework was then tested on a wider reference group and further refinements made.

Results

The data show a complex interplay as the actors (doctor, patient and computer) negotiate their place in the interaction. Initially, all participants are disconnected and must come together in a constructive relationship.

For all doctors in this study, the first doctor–patient interaction occurred outside the consulting room without the computer. The doctor exits the room to call the patient in from the waiting room. While not captured on video, their voices just before entering the room/stage can be clearly heard and were included in the analysis. This early, offstage interaction occurs in a public area and consists usually of non-specific social interactions which help to make a personal connection.

Entering the room was a fairly consistent procedure. Either the patient was ushered into the room and thus preceded the doctor or the doctor entered first and waited to close the door after the patient. Regardless, the patient made the first move into the room to establish seating positions. Conversation at this juncture again was usually of a social nature, often completing the conversation started outside the door. Generally, it is not until the humans are seated that the computer becomes involved in the consultation. In all the observed consultations, the computer was initially passive. Often the screen saver had activated between consultations, requiring a mouse or keyboard press to bring the screen up again. It was often the bringing up of the patient screen that heralded a shift of the scene from social conversation to the business of the consultation. Not until all three actors were on stage could the consultation begin.
There were a number of possibilities for this beginning depending on how doctors interacted with the computer in shaping their workflow. Many doctors checked the screen first, using the computer as a source of information to enter the consultation. This might be to read recall messages or information from previous visits. The positioning of the computer was an important factor in this process with the screen—and particularly the mouse and keyboard—indicating the doctor’s domain.

Figure 1 also provides an interesting example of how doctors can use small pieces of body language to establish the relationship. The pattern of this particular doctor was—unusually—to enquire about the RFE as the patient was walking into the room. By the time the doctor was seated, he usually had an understanding of the patient’s agenda for their consultation and sat forward attending to the computer when he sat down, often entering early details of the RFE. Then, he used the engaging behaviour of pushing back in his chair to start the consultation, re-establishing a closer relationship between the humans (by ‘excluding’ the computer) to direct the consultation along medical lines.

There were three basic forms of beginning. The first type, the ‘doctor’ beginning, was the most common and similar to pre-computer times. In this beginning, doctors tended to be very fixed in their initial interaction behaviour across all their observed consultations. Such fixed behaviour included both words and body position (starting all consultations with the focussing word ‘Now...’, for instance). The doctor adopts a similar sitting position and speech pattern for each patient, regardless of the situation. In this beginning, the doctor’s fixed behaviour shaped the consultation.

The second type was the ‘patient’ beginning. In this beginning, the patient dictated the flow, often because of their condition or a specific agenda. For example, one patient with suspected appendicitis was unwell enough to go straight to the couch and lie down. The patient’s physical position in the consulting room...

**Figure 1  negotiating the seating**

- **<Mother>** Hello, I feel like ‘. I’m here all the time lately
- **<D>** That’s all right, it’s good for business, so I don’t care... yes (name), so, what’s your problem
- **<P>** Well, I’ve been feeling pretty sick the last few days with umm, fairly bad migraines and I think last night I’ve had a really bad temperature
- **<D>** Yeah

A doctor beginning. Social banter fills the time when mother and daughter enter room, and occupy seats—mother off to side and daughter in ‘patient’ chair. The screen is oriented only to the doctor. In the second picture, note how the girl leans forward to glimpse the screen. The doctor sits down, having determined the RFE then pushes back in chair to start gathering detail. This engaging behaviour on part of the doctor signifies the emphasis on the patient’s information (different to the computer) at this point in time.
varied the beginning move, as the interaction had to occur in a different direction and required the doctor to move frequently between the couch and the desk (and the computer). The acuteness of the problem served to exclude the computer from the initial part of the interaction—prompts for health prevention activities are not important in the presence of suspected appendicitis or a vomiting patient. The reverse applied towards the end of this consultation, when a letter had to be written to the Emergency Department.

In the third, ‘computer’-driven beginning, it was the computer that shaped the first minute. A doctor might check the electronic record prior to seeing the patient, and therefore prepare for a procedure or begin the consultation asking about a recall—‘I see your Pap smear is due’—or begin the consultation with a discussion about test results. Alternatively, it might be the absence of information that drives the consultation. An example of this is seen in Figure 2, where the need to update the demographic details in the computer becomes paramount.

These initial behaviours have a significant influence on the gaze of the human actants. When the doctor addresses the computer, there is a tendency for the patient to be drawn into watching the screen, thus creating conjugate gaze (where both humans have the same object of gaze). It is quite common, however, for the patient gaze to ‘stick’ on the screen for a period of time after the doctor has turned to face the patient. This creates a variable period of disconjugate gaze (different objects) as seen in Figure 2. This following of gaze is independent of any specific relationship to the information being displayed on the computer and is indeed independent of the likelihood of the patient being able to assimilate what is on the screen. By indicating the computer early as a source of action in the consultation, the doctor draws the patient to spend time seeing what the source of interest was.

| <P> I’m just after some, a repeat of the prescriptions, | Computer-driven beginning. The doctor responds initially not to the patients RFE, but to the absence of information on the computer. This sequence demonstrates how conjugate gaze leads on to disconjugate gaze. The doctor and patient are initially conjugate towards each other, then both move to conjugate gaze at the computer—a process initiated by the doctor moving to check details. Then the patient gaze remains on the computer after doctor has returned to patient gaze—disconjugate gaze. |
| <D> Ok | |
| <P> yeah ^_^, Dapa-Tabs | |
| <D> Right, is that for your blood pressure? | |
| <P> Yeah I think, Yeah I think they are ^_^ yes (laugh) yes | |
| <D> well lets just have a quick squizz here, and I might just update my computer ‘cos I haven’t met you before | |
| <P> no, no | |
| <D> so I might just make sure ^_^ I’ve got everything here that I need to | |
Disconjugate gaze-inducing behaviour was not seen in the reverse direction—i.e. patients gazing at the computer did not induce the doctor to do the same. During these moves, doctors tended to conform to their preset patterns, rather than respond to the patient’s gaze. This ‘stickiness’ of gaze directed at the monitor is reflective of the monitor as the ‘face’ of the computer and reinforces its significance as the object of interaction for the patient, much more so than keyboard and mouse which remain the doctor’s domain. It is by directing attention to the screen that the patient can include the computer in the consultation.

Patients are able to invite the computer to join in this initial move by other means than gaze alone. Most commonly they do so by making a request of the doctor that will require the computer’s involvement to solve. These are usually phrases such as ‘I’m here for my test results’ or ‘I’m just here for a prescription’. Almost invariably these two phrases call on the doctor to address the screen for a variable period of time, irrespective of whether they are going to deal with the issue right then. Many patients indicated willingness for the computer to be involved in the consultation by emphasizing their request with either gaze or body language, such as a pointing finger (see Fig. 3).

The initial behaviour of the patient is often important in shaping the nature of the triadic interaction for the rest of the consultation. Again, both gaze and body positioning are indicators of how this occurs. Triadic patients (those inclusive of both the computer and the doctor) ensure that they are in a position to see the screen by shifting in the seat to face the screen or even shifting the seat itself in screen watching behaviour. Where this is not possible, such as in the case of fixed seating or an arrangement whereby the screen cannot be seen, patients will use head movements to indicate the screen or language to serve this function. This behaviour can be quite marked in some situations. Patients sitting across the desk from the doctor had to make quite major movements by sitting forward and turning towards the computer screen.

Conversely, this is the time when dyadic patients—those who tried to exclude the computer—presented other specific behaviours. Sitting in the chair in such a way as to face the doctor is one of these behaviours, as are more obvious behaviours such as using the elbow to exclude the screen from the interaction (Figure 4). Sitting well forward towards the doctor is another variation.

**Discussion**

**Main findings**

This research primarily describes the role the computer plays in shaping the first minute of the consultation. Often the presence of the computer is described as being ‘distracting’ to the consultation, while others are starting to treat the computer as an equal partner. Our research suggests it is a mistake to minimize the impact of the computer, treating it as just another tool in the consultation or a passive repository of medical records. When a consultation is distracted by the computer (as in Fig. 2), we see the computer as exhibiting agency, influencing the consultation independently. It effectively becomes an actor to which others in the consultation must respond. In Figure 2, the doctor responds to the computer’s request for information and initially ignores the patient’s RFE. Some consultations were driven by government-mandated ‘pop-up’ reminders (such as eligibility for free influenza vaccine) or other agendas dictated by the computer’s programming. Middleton described the consultation as one in which the agendas of the doctor and patient are negotiated to create an outcome. In this new consultation, the computer joins in that negotiation and influences the humans.

The beginning of the consultation involves a great deal of activity and position negotiation occurring in a short space of time, although little hard information is exchanged. This period of time is taken up with frame negotiation. What we have now described is the beginning of an understanding of the role the computer plays in this early interaction. Patient, doctor and computer will have satisfied their initial information needs and are poised to proceed with the business of the consultation. More than any other piece of
equipment—and even more so than the written medical record—the computer has the ability and the position to shape the consultation either directly or indirectly.

Behaviours in this phase—both computer and human—vary in duration. It is not the length of the interaction that is important, but its significance to the actors. The consultation is a place where a similar piece of activity can have different interpretations. Thus, a computer screen displaying the same information can be responded to in different ways, in much the same way that humans can respond to the same question in different ways. Another part of this study looks at the effects of different systems and screens. In the context of continuing work looking at the effects of the computer on the consultation, this work demonstrates the potential of the computer to influence the humans in the crucial first minute, both consciously and unconsciously. It adds to other work looking at the consultation as a whole and on changes in use according to the content.

Limitations
Observational studies have their limitations; our sample had few refusals and consultation numbers were similar to other studies. Observational work allows things to be seen that the actors in the consultation cannot, yet it also ignores their perspectives. This study is not the complete picture, but it does provide a framework for further research. The sample—although broad—may not represent the full range of behaviours, especially across the varied relationships between different patients, doctors and computer systems.

Meaning relative to other work
Increasingly, researchers are turning their attention to the impact of computers on the consultation. Other studies have described general behaviours, often classifying behaviour from the doctor’s perspective. More recently, it has been shown that doctors change their behaviour according to the type of the consultation. However, these studies have had an emphasis on the consultation as a whole, as distinct from (non-computer based) work that recognizes the individual importance of small parts of the consultation. By concentrating on the opening sequence, this study demonstrates the increasing importance of the computer in shaping the consultation and encourages us to make sure that such shaping does not adversely affect the consultation outcome. As computerization increases, and as more and more information becomes electronic, setting the tone of the consultation early will only increase in importance.

Conclusion
Work examining the computer in the consultation is in its infancy. The concept that the humans have a relationship with the computer may seem alien, but that
relationship exists; it is just of a different nature to the dyadic doctor–patient relationship. Patient centredness elevated the status of the patient in an interaction in which the doctor was perceived to dominate. There is risk that the computer—by exhibiting the independent agency observed here—will once again demote the needs of the patient. Resisting the adoption of computers is not an option. We need to learn how to integrate them to maximize the potential of the consultation.

Declaration

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Ethical approval: This project was approved by the University of Melbourne Human Research Ethics Committee.

Conflicts of interest: None.

References

28 Als A. The desk-top computer as a magic box: patterns of behaviour connected with the desk-top computer; GPs’ and patients’ perceptions. Fam Pract. 1997; 14: 17–23.