

Computer templates in chronic disease management: ethnographic case study in general practice

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ABSTRACT

Objective: To investigate how electronic templates shape, enable and constrain consultations about chronic diseases.

Design: Ethnographic case study, combining field notes, video-recording, screen capture with a microanalysis of talk, body language and data entry—an approach called linguistic ethnography.

Setting: Two general practices in England.

Participants and methods: Ethnographic observation of administrative areas and 36 nurse-led consultations was done. Twenty-four consultations were directly observed and 12 consultations were video-recorded alongside computer screen capture. Consultations were transcribed using conversation analysis conventions, with notes on body language and the electronic record. The analysis involved repeated rounds of viewing video, annotating field notes, transcription and microanalysis to identify themes. The data was interpreted using discourse analysis, with attention to the sociotechnical theory.

Results: Consultations centred explicitly or implicitly on evidence-based protocols inscribed in templates. Templates did not simply identify tasks for completion, but contributed to defining what chronic diseases were, how care was being delivered and what it meant to be a patient or professional in this context. Patients' stories morphed into data bytes; the particular became generalised; the complex was made discrete, simple and manageable; and uncertainty became categorised and contained. Many consultations resembled bureaucratic encounters, primarily oriented to completing data fields. We identified a tension, sharpened by the template, between different framings of the patient—as 'individual' or as 'one of a population'. Some clinicians overcame this tension, responding creatively to prompts within a dialogue constructed around the patient's narrative.

Conclusions: Despite their widespread implementation, little previous research has examined how templates are actually used in practice. Templates do not simply document the tasks of chronic disease management but profoundly change the nature of this work. Designed to assure standards of 'quality' care they contribute to bureaucratisation of care and may marginalise aspects of quality care which lie beyond their focus. Creative work is required to avoid privileging 'institution-centred' care over patient-centred care.

SUMMARY

Article focus

- How do computer templates for chronic disease management shape, enable and constrain clinical consultations?
- How does the tension between different ways of framing the patient (patient as 'individual'; patient as 'one of a population') play out as clinicians use templates to support chronic disease management and meet institutional targets?

Key messages

- Electronic templates introduced to assure quality of care in chronic disease management may privilege the needs of the institution for data over the particular needs of individual patients.
- Some but not all clinicians sustain a patient-centred approach through creative and flexible use of the template, while maintaining attention to the patient's narrative.
- Linguistic ethnography offers potential for studying complex sociotechnical practices in healthcare.

Strengths and limitations of this study

- Explores the *actual* social practices of working with templates at a level of detail at which more conventional qualitative methods (eg, interviews) cannot reach.
- Adopts a novel methodological approach embracing the complexities of interaction between humans and technologies, while retaining a broad appreciation of institutional context.
- Prompts new ways of conceptualising what is accomplished when templates are used.
- We prioritised depth of analysis over breadth. The two general practices we studied may not be typical of all practices in how they approach chronic disease management or technology use.

INTRODUCTION

The electronic patient record underpins one of the cornerstones of chronic disease management, the 'three Rs' of registration, recall and regular review.¹ Information technology is seen as key to a high-performing chronic care system.² It facilitates effective population

management (eg, disease registration and population risk stratification), supports communication between professionals, and provides data to inform the continuous quality improvement cycle.² Over 2000 primary studies, mostly randomised trials, have measured the impact of the electronic record on different aspects of care,³ but many had methodological flaws and questions remain unanswered about the circumstances in which the benefits of these technologies outweigh their limitations.⁴ Nevertheless, it is widely assumed that electronic records and related technologies will result in better care for patients and efficiency savings for clinicians.⁵

In many chronic diseases, clinical trials and cohort studies have produced robust evidence-based guidance on what works—and what may happen if particular conditions or risk factors go untreated.⁶ In the UK, best practice in prevention, surveillance, and therapy is summarised in patient pathways, guidelines and decision support algorithms which are routinely available on the clinician's desktop computer as pull-down menus, pop-up prompts and templates (electronic forms).⁷ These tools support structured management of individual patients ('primary use' of data) and also produce aggregated data on costs and/or organisational performance ('secondary use').⁸ The latter may be linked to incentives, for example, the UK Quality and Outcomes Framework (QOF).⁹

In the UK, 6 out of 10 adults report having an incurable long-term condition; it is not unusual for an 80-year-old individual to have five or six such conditions.^{7 10} Concerns are emerging about fragmentation of care,^{11 12} and the dangers of the 'vertical' disease-specific focus implied in translational research and in clinical guidelines.¹³ What constitutes the 'best care' for patients with multimorbidity is poorly understood¹⁴ and has been identified as a priority area for further research.¹⁵

It is often said that 'chronic diseases require a complex response',¹⁰ and that structured care, for example, by using checklists or templates, is a mark of quality in chronic disease management. Templates have also been identified as a way of streamlining consultations and establishing routines.¹⁶ Templates are formal tools which enable care to be undertaken systematically and which open up scope for manipulating, aggregating, transporting and sharing data. Although structured care and attempts to standardise clinical terminology predated the introduction of electronic records, these technologies introduce new possibilities for such care. For example, a quick search can identify not only the proportion of diabetic patients with an HbA1c below an institutionally defined target, but also which *particular* individuals have been given smoking advice (or not) within a defined time period (or at least the extent to which such activity has been documented). 'Off target' individuals can be identified quickly and in an automated way, triggering responses designed to 'chase' patients, and constructing a new category of 'patient' defined by the practice's procedures—that is, someone

whose data fields are incomplete or whose values are out of range.^{17 18}

From the patient's perspective, chronic illness is a unique personal experience which may involve pain, disability, loss of status, reduced income and a heroic struggle to retain dignity, rebuild identity and live a moral life in the face of adversity.^{19–22} The consultation is an opportunity for the patient to tell their story to an involved listener²³—who in turn shapes the telling and is a witness to their suffering.^{24 25} Constructing a narrative in the context of an ongoing therapeutic relationship is one way in which a patient makes sense of their illness.^{26 27} Conceptualised this way, the consultation focuses on a patient's specific, particular experience—the 'here and now'. As Balint emphasised, continuity of care in the general practice relationship provides repeated opportunities for recounting the illness narrative, helping to build the therapeutic relationship.²⁸

The rationalisation of chronic disease management, guided by a limited set of coded entries on the electronic record exposes what some authors have termed a rationality–reality gap²⁹ or fatal paradox³⁰ between the inherently messy and unique nature of healthcare work and the standardisation of this work. Central to this paradox is a tension between different ways of framing the patient—the patient as an individual whose illness narrative is unique, and the patient as one of a population, all of whom need standardised management of the 'same' disease.³¹

In this study, we sought to address two questions. First, how do computer templates for chronic disease management shape, enable and constrain clinical consultations? Second, how does the tension between different ways of framing the patient (patient as 'individual'; patient as 'one of a population') play out as clinicians draw on these templates to support such consultations and meet institutional targets? We adopted a sociotechnical approach, meaning we focused on the dynamic, contingent interaction between humans and technologies rather than assuming technology is itself 'causal' of specific effects.^{32–34} From this perspective, the electronic record is not simply a collection of hardware and software on the clinician's desk, but is a complex 'social substance' definable in terms of the properties of a social world.³⁵ The template is itself a manifestation of complex sociotechnical practices and relationships involving systems engineers, clinical software designers and others, whose assumptions about chronic disease management practices become inscribed (and reified) in the template. In this study we sought to illuminate how and to what extent templates—and the sociotechnical practices of which they are a part—contribute to what is accomplished in the clinic.

METHODS

The study was a part of the Healthcare Electronic Records in Organisations (HERO) study, funded by the

UK Medical Research Council under a ‘new methodologies’ call which highlighted the limitations of experimental studies for certain research questions. Details of governance and ethical approval for the study have been published³⁶ and the methods used in this part of the HERO study have been described in detail elsewhere and summarised briefly here.³¹

DS (a general practitioner, GP) conducted 8 months (187 h) of ethnographic observation in two UK general practices, in clinical and administrative areas. The practices served mixed populations of approximately 11 800 and 12 600 patients, respectively, both used the EMIS LV clinical system (the most widely used system in the UK), and both practices scored highly in the QOF.

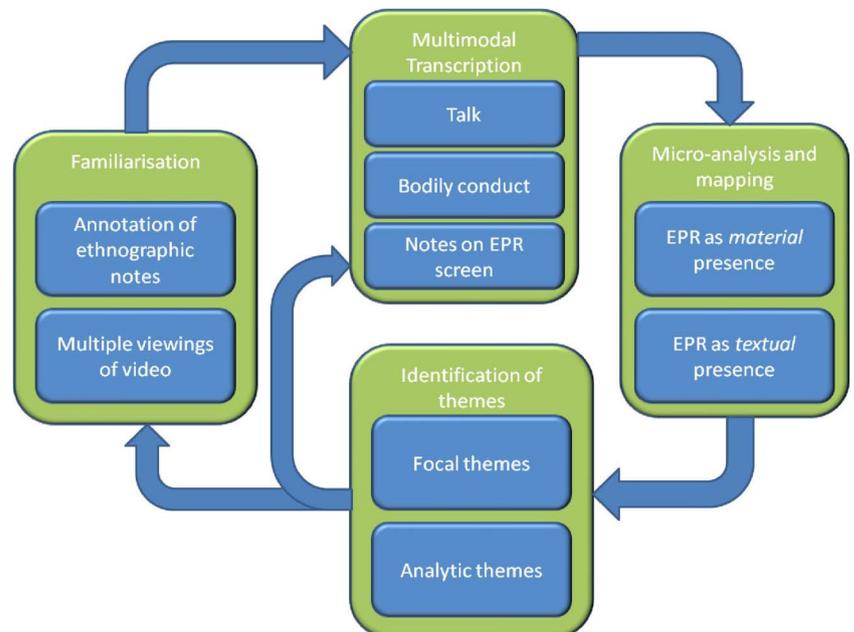
Observations began in what the sociologist Erving Goffman called the ‘backstage’³⁷ regions of practice (ie, areas which are not usually ‘patient-facing’ eg, administrative offices), shadowing individuals as they worked. The researcher made detailed field notes and elicited narratives from staff, seeking to identify ‘What is being accomplished here?’ Documents (eg, recall letters and patient leaflets) relevant to chronic disease management were collected. This naturalistic approach seeks to generate in-depth knowledge about how and why people behave as they do in particular settings, while minimising the impact of the researcher.³⁸ Observation then moved to the ‘front stage’—that is, the main focus of the clinician–patient communication—the clinical consultation.³⁷ Twenty-four chronic disease management consultations were observed, then 12 were video-recorded, with parallel screen capture of the computer display. The two video streams were merged and synchronised using video editing software (Adobe Premiere Elements 4, Adobe systems Incorporated)

allowing us to observe the ‘electronic record-in-use’. Recording began when the record was accessed (often several minutes before the patient entered the room).

Our work is a contribution to an emerging field called ‘linguistic ethnography’ bringing together a focus on language—in this case a microanalysis of the unfolding consultation—with ethnographic appreciation of the wider institutional context.³⁹ It is underpinned by a social constructionist perspective, that is to say language (which incorporates actions as well as words) does not just reflect or express intentions or decisions (the *representational* role of language), but *makes* them (the *constitutive* role of language)—talk *is* work.⁴⁰ Our frame of reference is interpretivist; we seek to explore the meaning-making of our research participants as they engage in the actual practices of chronic disease management.

Our iterative approach to data transcription, annotation and analysis is shown in figure 1. Field notes were annotated, and videos viewed multiple times. Transcription incorporated Jefferson conventions for the spoken word (as in conversation analysis—see table A1),⁴¹ to which we added a simple horizontal arrow (→ or ↔) to indicate direction of gaze, notes on bodily conduct and notes on the electronic record, using time as an anchor.⁴² We mapped consultations and conducted a detailed microanalysis of the moment-by-moment unfolding of the interactions. This included paying attention to the *material* features of the electronic patient record (EPR) (eg, screen and keyboard) and the *textual* features (displayed medical information, prompts, alerts and fields for completion). We identified *focal* themes relevant to the professional domain (such as agenda setting) and *analytic* themes

Figure 1 Approach to transcription and analysis.



(from linguistics and sociology) such as Goffman's notion of 'involvement'.⁴⁰ Goffman defines involvement as sustaining 'cognitive and affective engrossment' in an activity, or the 'mobilization of one's psychobiological resources' (ref.²³, p 36).

RESULTS

The dataset comprised over 400 pages of ethnographic field notes (of which around 15% related directly to chronic disease management) and 12 video-recordings with screen capture (of a total of 54 recordings incorporating all aspects of general practice). We illustrate our findings with selected data extracts and accompanying analysis, drawn from a variety of sources including ethnographic field notes, transcripts and practice documents in the following section.

Electronic record shapes how disease is defined

In both practices, chronic disease management was organised so that each of the patient's chronic diseases resulted in a different occasion for care, often with a different nurse using a different template. This arrangement assumed that patients (and nurses) could distinguish features of one chronic disease from another in the face of multiple morbidities. A common way for the nurse to frame the purpose and scope of the consultation was to use statements such as "how have things been from the diabetes point of view?", or more simply "so...asthma review". To use Goodwin's terminology, these questions do the work of establishing what is 'figure' (relevant, salient) and what is 'ground' (less relevant to the enquiry).⁴³ Occasionally this separation of the patient in to different chronic diseases was identified as potentially problematic. An example is shown in box 1.

The nurse's statement (box 1) "I know you have a lot of other things going on but we've called you in to look at your heart" performs two contrasting functions. On the one hand, she acknowledges the difficulty inherent

in separating out his 'heart' problem from his other illnesses and wider experiences, making it legitimate for the patient to frame his heart problems in a broader context. However, in the next part of her utterance "but we've called you in to look at your heart", she exhibits what discourse analysts call a 'scale jump'.⁴⁴ She shifts quickly from an individual, unique 'here and now' framing ("I know you have...") to a more general institutional framing ("we've called you in..."). This shift indexes what is most relevant and implies certain limits around what may happen in this consultation.

The patient responds by juxtaposing his prime concerns with the 'core' concerns of this clinic. First, he rarely uses his angina tablet—but only because his mobility problems outweigh his angina. Then his concern about simvastatin moves swiftly into a complaint about his hearing aids. Neither mobility nor deafness are pursued by the nurse (or recorded on the electronic record); they are 'unremarkable' problems in this (heart) clinic. It is not simply that these concerns remain unexplored *because* there is no field dedicated to them in the template. More subtly, the practice of using a template shapes how disease and illness experiences are made sense of in this environment.

The template is not merely organised around a single disease entity, but around a particular *version* of this disease, reflecting the assumptions of those responsible for designing the template. For example, diabetes in all its complexity is rationalised in terms of a series of codes, for example, weight, units of alcohol, blood pressure, lower limb pulses (present or absent)—with minimal (if any) supporting a free text. The primacy of the 'measurable' was often made explicit in the consultation. For example, 3 minutes into a diabetes consultation, one nurse faced the computer screen as she announced "CAN WE DO a few measurements today then just to see (0.2) uhm where everything is". Here, not only are "measurements" equated with what is to be recorded on the electronic record, but it is implied that they will reveal "everything". Another nurse—in an asthma clinic—remarked (as a patient moved to leave) "Hang on a minute. I need to pop these in here (turning to computer)...this is a whole set of measurements which tells us where your lungs are now."

Nurses frequently engaged in the kind of activities which characterise bureaucratic encounters.⁴⁵ For example, deviations from the institutional agenda were brief; patients' talk was interpreted in direct relation to the template (an example of an institutional script, or a particular way of accounting for practices);⁴⁶ and talk was steered in particular institutionally relevant directions. For example, in table 1, from a diabetic clinic, the nurse anticipates an upcoming field in the template ('Depression Screening'). At the time, the QOF required case finding for depression among diabetic patients, using two standard questions (*During the last month have you often been bothered by feeling down, depressed or hopeless? During the last month, have you often been*

Box 1 Framing the purpose of the chronic disease management clinic (ethnographic fieldnotes)

A frail-looking 86-year-old man struggled into the clinic, barely able to walk. He was very deaf. He hung his walking stick over his chair and grimaced as he sat down, looking as if he was in pain. The nurse said loudly "We've called you in to look at you from the heart point of view. I know you have a lot of other things going on but we've called you in to look at your heart." She then asked "How often do you use the angina tablet under your tongue?" The patient replied in a way which made his most pressing concern clear: "Not much...for the simple reason that I can only crawl like a tortoise"

Nurse: "and the simvastatin?"

Patient: "no...I stopped that. I think it's giving me diarrhoea. These hearing aids are not very good you know. I've had it adjusted several times but I'm really disappointed. I had hoped for better than this"

Table 1 Extract from consultation in a diabetic clinic

Time	N/P	Words spoken/sounds	Bodily conduct	Screen
18.54	N	Does the diabetes get you ↑down Mr C?	N→EPR; P looking down doing shoelaces N↔P	Diabetes template, with fields completed relating to foot examination. Cursor highlights field 'Eye Clinic' (Y or N)
18.57	P	(1.0) I get bored with life	N↔P. P puts hands on both his knees P frowns	
18.58	N	Bo::red? What bored with the f:ood o:r	P turns head to gaze at an adjacent chair. N→P P↔N	
19.00	P	(1.2) HA HA HA		
19.02	P	.hhh ah well °never mind° (0.2)	P turns to an adjacent chair and lifts his jumper P lifts his jumper as turns towards N again	
19.04	P	I u::- used to be a drinking man (0.8)	P↔N P looks straight ahead. N remains looking at P	
19.06	N	[right		
19.07	P	[And when I had to give up the beer I had to give up an awful lot of other things: (.) surprising really	P holds his jumper up in front of him and arranges it, looking at it as he talks	
19.11	N	°<Yeah (.) yeah>°	N→P	
	P	mm	P looks ahead, purses lips	
19.13	N	So you have a whiskey (0.8)	P turns to N	
19.15	P	Yeah I have a whiskey at night	P↔N	
19.16	N	°yeh° (0.2)	N nods	
19.17	P	Cos ↑whiskey hasn't got much sugar in [surprising	P returns to rearranging his jumper holding it up in front	
	N	[no:		
	P	its all been turned into alcohol a good whiskey maker so (0.8)	P still holding his jumper in front turns to N N→P, N nodding slightly	
19.23	N	And beer has quite a lot of carbohydrate doesn't it		
	P	[yeah	P returns his gaze to his jumper, nodding	
	N	[when you think of the volume (0.6)	N turns gaze to her desk	
19.27	N	°okay° (1.6)	N gazing at desk, P arranging his jumper	
19.29	N	°All right then° (N typing for 12 seconds)	P looking ahead putting his jumper over his head. N rotates to face EPR	Bypasses field 'diet' Bypasses field 'impotence' Next field is 'depression screen' –enters 'Y'.

bothered by having little interest or pleasure in doing things?). Although we observed no examples of this precise wording being used, nurses often incorporated their own versions, enquiring about the 'mood' or feeling

'down'. The transcript in table 1 shows the nurse's handling of these questions. In this extract she refers back to a brief account of whiskey drinking, which the patient had offered about 7 min earlier:

Patient: “well I look a- I look after myself I drink whiskey to counteract the cigarettes y’know”

Nurse: “do you (laugh) a whiskey a day?”

Patient: “yeh”

In table 1, the question “Does the diabetes get you down Mr C?” is met by a relatively long pause (in conversational terms). The patient frowns and says he gets ‘bored with life’ widening the perspective towards his broader life experience. The nurse responds with a question which invites elaboration, but simultaneously refocuses on a narrow diabetes-relevant cause (*the food*). This is an awkward moment and prompts the patient to withdraw his gaze, laugh ironically, lift his jumper and say, quietly “ah well °never mind°”—communicating disappointment. A brief but poignant narrative unfolds, painting a picture of a man who has reluctantly made lifestyle changes, restricting his enjoyment of life. Being a ‘drinking man’ was part of his (male) identity and conjures up a social life around alcohol (“when I had to give up the beer I had to give up an awful lot of other things:”). At 19.11 the nurse slows and quietens her speech, perhaps encouraging elaboration, but the narrow biomedical focus of the template items is restored from 19.13 onwards, the patient justifying his whiskey by reference to its minimal ‘sugar’ content, which the nurse recontextualises into even more ‘scientific’ terms—‘carbohydrates’ and ‘volumes’.

After the patient leaves, the nurse corrects the ‘alcohol’ record she had entered earlier. She replaces ‘14U’ (copied from the previous year’s entry in the template) with ‘7U’. “A whiskey a day?” becomes ‘one unit’, in what is an uncritical shift from an *unquantified* volume of whiskey to an (apparently) *quantified* one. The complex interactions between the patient’s diabetes, his identity as a ‘drinking man’, his losses and his ‘boredom with life’ are reduced to an institutional account which reads simply (and potentially misleadingly): “Depression screen—Y; Alcohol—7 units”. The construction of particular versions of diabetes contributes to constructions of particular kinds of patient, discussed further below in this article.

Electronic record shapes how care is delivered

The electronic record shapes care delivery in several ways. It is often the prompt to care, defined by ‘overdue diary entries’, overdue ‘medication review’ dates and audits by a tool called ‘Population Manager’ identifying patients with missing QOF data (‘we’ve called you in’—box 1). Patients attend regularly, or may sign disclaimers, in a process which is institution-led, rather than patient-initiated. For example, in one practice letters of invitation to the ‘cardiovascular check up’ were signed off by *Practice Administration* (not a clinician) and couched in institutional terms (“We are now regularly reviewing all patients who have angina or who have had a heart attack. As a result of this we would like you to attend a

health check...(further appointment details). There is no need to be concerned about this appointment we are just striving to maintain the standards of care we provide for you.”) The potential benefit to the patient is implicit and abstract rather than explicit and specific. For example, the justification for the check is presented only in terms of *maintaining the standards* or a *regular* procedure. Despite receiving written invitations, patients often remained confused about why they had been summoned (“What do you want to see me about then?”).

The requirement for data was—occasionally—the primary reason for the consultation. In one cardiovascular clinic a patient began by apologising for telephoning 3 days earlier to check whether her review was necessary. She had been reviewed in the hospital’s cardiology clinic the same week. The nurse responded by explaining that the practice is not always sent the information by the hospital “and we have to have our records up to date.” What is interesting here is not so much that the patient may well have had to attend two very similar appointments in 1 week, but that the need to keep the record ‘up to date’ is presented as an adequate and a sufficient reason for the appointment. The ‘need’ for data seemed to outweigh any need that this particular patient felt (or necessarily had) for care.

These examples illustrate that while on one hand the electronic patient record facilitates the regular recall and review which are critical to a high-quality chronic disease programme,⁴⁷ there are potential pitfalls to a highly automated recall system, especially if it is disconnected from the wider set of relationships within which care is delivered, or if the rationale behind it does not make sense to individual patients.

The electronic record also shapes and constrains how the consultation unfolds moment-by-moment. Chronic disease consultations often (though not always) took a linear and standardised format. Consultations tended to start and finish with the same questions, and focus on information gathering and documentation. One consultation was interrupted on two occasions by the patient standing up to take his leave, the nurse advising “You can’t go yet (laughing) ... we’re not finished yet”. It was common for nurses to face the computer screen as they explained the reason for ‘calling the patient in’, and the ‘orderliness’ of the clinic was often made explicit (eg, “We’ll start with your blood pressure”). Table 2 shows a detailed transcript revealing this institutional ordering in an asthma clinic.

In this example (table 2), the nurse frames the consultation as an *assessment*, first to see how “your asthma’s doing” (an assessment of the asthma) which she then reformulates as “what you’re doing with it when it’s good, what you do with it when it’s bad” (an assessment of the patient’s practices). This metaphorical separation of disease from patient was common. The use of the word *assessment* sets an evaluative tone and anticipates an enquiry which incorporates smoking status, inhaler technique, concordance with medication and peak flow

Table 2 Setting up the frame for the asthma consultation

Time	N/P	Spoken word	Bodily conduct/notes on EPR
01:08	N	So really straightforward (0.4)	N puts a paper on the desk N rotates body and gazes to face P, her hands on her lap. P looking at N
01:09	N	Asthma assessment (0.4)	
	P	Okay	P nods
01:11	N	to see how your asthma's doing:	N raises both hands in front
01:13	N	what you're doing w- with it when it's good, what you do with it when it's bad, (0.2) have you any problems with your ↑inhalers (0.4) .hhh (0.5)	N uses fingers to count (on 'good', 'bad', 'problems')
01:19	N	Very straightforward stuff	N hands open out in front of her N hands to lap
	P	Oka[y]	P nods
	N	[all right? .hhh	
01:21	N	U:::hm	N rotates body and gaze to EPR screen, hands on lap
01:23	N	What I've got <u>here</u>	N gestures her open hands towards the EPR screen (displaying the patients 'summary' screen) N rotates back towards P, bringing hands together
01:24	N	Is that you're on:: (0.4) a purple inhaler?	
01:26	P	(0.2) Yeh (.) uhm (0.2) seretide.	P glances briefly towards the EPR screen

EPR, electronic patient record.

measurement. The nurse emphasises (1:08 and 1:19) that it is *really* or *very* straightforward, and at 1:13 she counts on her fingers a three-part list, flagging the linearity of what is to follow and setting out what she and the patient should achieve. It might be interpreted as reassurance, but this is a reassurance about what he may expect of the *structure* of the clinic, not that his specific concerns will be addressed. Following this data extract, the nurse gestures towards the computer as she explains “What I've got here is some questions that I—I need to ask you... they're fairly straightforward ones but what they tend to do with is that they will flag up whether there >actually< we *have* got what w- what I would call breakthrough symptoms.” The institutional imperative is clear (“I need to ask you”) and she again highlights the *straightforward* nature of the task, as she identifies the template as the origin of the questions. As the patient begins to demonstrate his inhaler use, he coughs loudly 5 times, beats his chest demonstrably with his hand and announces:

Patient: “I *do* suffer very badly from phlegm in the mornings... which I presume is part and parcel of having asthma.”

Nurse: “It *can* be (.) yeah which (0.4) anyway I—we'll talk about that in a minute...we'll do the inhaler first.”

Despite weaving his own concerns into the assessment of ‘inhaler technique’ and using elaborate gestures for emphasis, the nurse steers the patient's activity back to

the institutional script and does not revisit the issue of the morning phlegm. She later goes on to enquire specifically about asthma symptoms, but not until almost 16 min into the 19 min consultation...when prompted by a template field reading ‘night symptoms’.

Electronic record shapes what it means to be a patient

The template contributes to the construction of ‘institutional’ versions of the patient and may make it difficult for professionals to retain a perspective on the unique individual. One nurse said that the structure can make it difficult to *take a step back*—that some patients return annually for asthma checks even though she wonders whether they are definitely asthmatic at all (“once they have acquired a diagnosis they just keep coming back”). While the asthma clinic may seem as a reasonable setting in which to review a patient whose diagnosis is provisional or uncertain, the template does not handle such ambiguity well, and the recall procedures behind it can lead to the ‘production’ of consultations and the production of patienthood (the ‘asthma patient’). There is a considerable scope for unhelpful, potentially incorrect labelling of patients. An example is shown in the ethnographic field notes in box 2.

Putting aside the absurdity that a 2-year-old has a Read code for ‘Never smoked tobacco’ in his record, the example in box 2 shows the disparity between the individual narrative that was built in the clinic and the ‘minimum data set’ in the institutional account.⁴⁸ It also

Box 2 Constructing patienthood in the asthma clinic (ethnographic fieldnotes)

Sam, a lively 2-year-old came with his mum. He ran excitedly around the clinic room investigating every corner. His mum seemed exasperated and said she was not getting far with his treatment, a plastic 'spacer' device to which the 'pumps' were attached. The boy's dad and grandparents were asthmatic, but Sam only saw his dad occasionally at weekends these days.

The nurse explained that the diagnosis of asthma cannot be certain in a 2-year-old. Things might be clearer by the time he was about 4. His mum was obviously relieved to know that it was not a definite thing. She was very anxious that her ex-partner would not know how to look after her son when he visited him. She asked "There's nothing I could have done to stop him getting it, is there?" The nurse explained it was not her fault and did what she could to be reassuring. She explained what the different inhalers do...

The nurse pointed towards the computer, saying that she was going to make some notes. She completed the template line-by-line and there was no talking for several minutes. Sam ran towards the door and started rattling the door handle, but his mum said firmly "NO...you've got to wait for the lady to finish her typing."

The nurse handed over a prescription and they left.

The electronic patient record (EPR) consisted of a collection of Read coded entries with some limited free text alongside:

Never smoked tobacco

Inhaler technique moderate

Inhaler technique shown (needs to commence low dose ICS. I will monitor)

Symptoms occur at night (7/7)

Asthma limiting activities

Asthma management plan

Asthma compliance satisfactory (needs ICS)

Asthma daytime symptoms (consistent cough)

Asthma medication review

Asthma monitoring check done

Follow-up asthma assessment (date)

shows how the expressed ambiguity about the asthma diagnosis is wiped out (and not alluded to) in the record—numerous asthma Read codes are entered. While this is sure to result in regular invitations to the clinic, the institutional 'truth' bears little resemblance to the reality it seeks to record. The contrast between the mother's relief at the *uncertainty* of the diagnosis, and the *certainty* which was constructed in the record is striking. More subtle, transient moments of ambiguity, which required the shaping of patients' accounts into an inflexible (often binary) categorisation, were common (eg, a patient's hesitant 'not really' becomes 'no').

Electronic record shapes what it means to be a clinician

The opportunity for nurses to develop new areas of expertise in chronic disease management is frequently described in terms of 'role-expansion', 'professional empowerment' or *Liberating the Talents*.⁴⁹ As the disease areas covered by the QOF have increased, so has the variety of nurse-led,

disease-specific consultations on offer. In this study, nurses were often defined by chronic disease specialty. For example, in one practice, photographs of the nurses in the waiting room had their disease-specific expertise listed alongside (eg, Christine—Asthma). One practice newsletter read: "Our practice nurses receive special training to monitor people with chronic diseases and to carry out many procedures independent of doctors." This entry not only constructs chronic disease as 'nursing work' but describes a 'monitoring' role which sounds different to the 'care' we may traditionally associate with nurses looking after the chronically sick. With nurses thus defined, GPs took on the role of 'trouble-shooter' or consultant,⁵⁰ called upon when more complex problems arose. In one practice, healthcare assistants conducted cardiovascular and hypertension reviews. Although able to gather information needed to *inform* chronic disease management (eg, blood pressure and details of smoking) healthcare assistants are not clinically qualified. This 'redistribution' of chronic disease management to the least qualified (and least costly) team member has been previously described and shifts the meaning of the term 'management' towards one of the managing data rather than patients.^{18 50}

The extensive use of templates as a way of delivering chronic disease managements was rarely questioned. The little that was said was broadly positive, and echoed the 'monitoring' perspective conveyed in the newsletter ("templates encourage us to get to grips with the management of microalbuminuria in diabetes and take a more aggressive stance towards blood pressure control"). Several nurses suggested they relied on templates and might easily forget things without them. However, one nurse said she tried to avoid relying too heavily on the template, as doing so tended to result in her "losing her train of thought"; she preferred to jot notes on paper to add to the template later. Some specific difficulties were voiced, such as the perception that important things may not be documented "because there is nowhere in the template to put it", and "you sometimes become so absorbed in the template that you can miss what is right in front of you in the patient." On one occasion when the computer crashed midway through a cardiovascular check, the nurse apologised in advance ("I'll have to do it a little out of order because I've no computer") and again later ("I'm sorry it's been such a higgledy-piggledy consultation"). This incident highlighted the extent to which her work had become interwoven with technology use. It seems unlikely that this senior, experienced nurse could not do a cardiovascular check without the prompts before her eyes. Rather it was because her embodied practices had become so finely tuned to incorporate the technology that to conduct a consultation without it had become almost impossible.

In one practice, an information technology manager was responsible for developing and maintaining computer templates, and he identified templates as a fundamental characteristic of quality care. A private company who had recently taken over the management of a local

'underperforming' practice was employing one of his GP colleagues to improve practice systems. He explained that "they were very impressed with our templating"; the doctor had duly provided copies of their templates for the 'underperforming' practice. The integration of templates (and a new word—*templating*) was presented not only as a *feature* of good practice, but as potentially constitutive of good practice in an organisation which was otherwise failing—a transferable 'good'.

The template contributed to redefining 'professional vision'⁴³ by encouraging particular ways of looking, categorising and sense-making, fostering a particular orientation to the world, captured in Goodwin's words: "When disparate events are viewed through a single coding scheme, equivalent observations become possible" (ref. ⁴³, p 608). For example areas of institutional relevance (such as those which attract points in the QOF) were often privileged over patients' more immediate concerns. The template shaped not only *what* was relevant to record, but also *how* this was recorded. For example, symptoms were recorded as either 'present' or 'absent' when patients described a much more complex reality. The clarification of a patient's experience 'in general' was sought more readily than 'particular' experiences. The template brought new definitions of nursing and GP work, new conceptualisations of practice and new appreciations of what constituted 'good' practice.

Using the template creatively

Some nurses displayed exceptional creativity in how they used the template. We illustrate this by reference to [tables 3 and 4](#) which shows two extracts from a single consultation in the asthma clinic. In this consultation, the patient can see the screen if he turns his head slightly, but the nurse does not start to complete the template until 10 min into the consultation. Until then, she faces him across the corner of the desk, occasionally jotting notes on a paper placed between them.

The nurse uses several strategies to elicit a narrative at the outset ([table 3](#)) beginning with an open invitation "tell me ..." The word 'tell' invites a story, and she shifts into a posture displaying readiness to listen, moving her chair away from her desk (and the computer and her notes). The patient hesitates and there are some relatively long pauses in his telling, but she refrains from filling these with anything other than tokens of attentiveness. She mirrors the patient's laugh and shrug of the shoulders from 1:10 to 1:15 in a way which is effective in encouraging him to tell some more.

She goes on to encourage the patient to describe his inhaler use, and learns that he had recently woken up short of breath. His inhaler had not worked well and he could not get back to sleep. She makes occasional notes, describes aloud what she is noting, then summarises the story which the patient confirms. Having established some confusion over when he should be using each of

Table 3 Opening of asthma consultation

Time	N/P	Words spoken	Bodily conduct/EPR screen
00:57	N	..uh SO: (0.6) [tell me [C (0.3) what inhalers do you use (.) and when do you use them. (0.4)	N writing Remains oriented to P as makes one keystroke to display prescriptions N rotates her chair, pulling it back away from the desk & re-orientating so that posture and gaze are towards P. She gestures towards his inhalers on the desk with her L hand on 'what inhalers' N draws chair closer to P, still oriented towards him
1:02	P	U:::hm (1.8) Well say like if I get > sort of< out of breath (0.4)	P rubs his nose P puts his hand on inhaler, looking at N
1:07	N	Uh uh	N nods
	P	then I'll take the brown one.	P points to the brown inhaler on the desk and looks at it
1:09	N	Uh uh (1.2)	N nods, looking at P Mutual gaze
1:10	P	but uhm (2.7)	P looks down at inhalers P↔N. P shrugs his shoulders
1:14	P	He [he	P smiles, and slightly laughs as looks at N
	N	[he he he	N joins P in smiling and a slight laugh. N shrugs her shoulders
1:15	P	I mean sometimes I'll use the blue one. (0.4)	P lifts the blue inhaler just off the desk, looking at N
1:17	N	Right	N nods

Table 4 Creative use of template

Time	N/P	Words	Bodily conduct	Screen
10.37	N	Let's pop it in the screen and see what we've got.	N pulls her chair into the desk, gazing at the screen. P→EPR	Consultation screen
10.39	N	[A::dd [C (C) [Templates [C (C) [Respiratory [C (C) [Asthma [C (C)	N types keystrokes with her R hand holding the PEFR meter in her L hand P looks at the screen throughout	Consultation screen. Entry 2 months earlier by receptionist— Asthma check due. Navigates to 'templates' List of templates presented Selects R—respiratory templates There are 4 respiratory templates from which she selects A asthma
10.43	N	So Monitoring check [DONE [C [Now [C your height was a hundred and seventy one point fi:::::ve .hhh look you've <u>grown</u> a centimetre	N looks down at a piece of paper to L of her desk then types in his height into template N gazes at the screen and points to the screen sweeping finger across to show him the previous height on the template	First line in template 'monitoring done'— she adds Y (yes). Hits return so today's date is entered. Then skips a line called 'except report' Field: O/E height
10.49	P	Have I HE HE (laughs) [C C] (0.8) [Doesn't show it [C	[return]	Field: O/E weight, last recorded entry 16m ago
	N	he he (0.2) (Transcript not shown)...		Field: smoking status (7 options). Last recorded entry "Never" 30m ago
11.11	N	O:kay ↑SO:: (1.0)	N looks down at the paper on her desk, pointing at it with R hand	Field: Peak Flow Rate
11.14	N	Five <u>thirty</u> was your best wasn't it ((C C C C)) (3.7)	N→EPR; P →EPR N→keyboard as types. P→EPR	Enters 530, return displays today's date. EPR calculates predicted PEFR as 600
11.19	N	So: your predicted is 600 >so it's a little bit< under but that's not <u>too</u> bad	N and P looking at screen	
11.24	N	↑was five thirty your best? (1.8)	N →EPR; P→ EPR N reaches for PEFR meter and looks at gauge. P →N	
11.27	P	[°was it five eighty?°]	N tightens cap on PEFR, P looking at N	
	N	[Just do it once more for me		
11.29	N	DID YOU::?	N passes PEFR to P who stands up as receives it	

PEFR, peak expiratory flow rate; EPR, electronic patient record.

his two inhalers, she uses a picture of the respiratory tract as part of her explanation, saying “I think if you know how the drug works on your body it makes sense

how to use them.” She goes on to check his height and peak flow rate, then joins him (“let's have a look”) as they cluster around the peak flow metre, each holding

one end of it. The nurse says that it was not very good and that he could do better—which makes him laugh—then she demonstrates how to do it. After his second attempt they again cluster around the peak flow meter (N: “tha::t was a bit bette::r ...LOOK four hundred a::nd eighty.”). After a further attempt the nurse says “Excellent. Well done. What we got? There we go. LOOK five hundred and thirty that time.”.

The nurse and the patient are fully involved in this activity, in Goffman’s sense of being both cognitively and affectively engaged.²³ The nurse’s talk is inclusive (*let’s, we, what we got, there we go*) and her bodily conduct encourages a joint engagement in reading the peak flow metre. Having already created a collaborative environment, she turns to the computer for the first time almost 10 min into the consultation (table 4, 10.37).

Again the nurse uses inclusive language as she orients towards the screen, inviting the patient to look. Between 10:39 and 10:43 she makes a deliberate show of navigating towards the asthma template. She enters his height, points at the screen, makes a joke. By making the template deliberately visible and socialising around it she retains control over the progress of the consultation and legitimises her need to attend to some institutional work. But by involving the patient in the recording activity (not literally, but through making it a shared endeavour and using much inclusive language) she effectively maintains a patient-centred approach while briefly attending to institutional requirements.

She invites further collaboration in making the template entry at 11:14 onwards (*five thirty was your best wasn’t it*). The patient does not initially respond although he continues watching the screen. The computer automatically displays his ‘predicted’ peak flow rate (peak expiratory flow rate (PEFR)). The nurse evaluates the measurement as a “little bit under...but not too bad”, minimising any sense of trouble. But the mismatch between his ‘actual’ and his ‘predicted’ result prompts the nurse to reformulate her question to one which is more demanding of an answer (“was five thirty your best?”). When the patient hesitates and suggests it may have been higher, the nurse suggests a recheck. This confirms the measurement, but the act of repeating it displays a collaborative approach. Neither the nurse nor the patient’s account is taken as ‘truth’—a remeasurement settles the matter. In summary, this nurse is successful in eliciting a narrative, while also making the bureaucratic requirements deliberately visible. She skillfully minimises the distance between ‘individual’ and ‘institutional’ framings of the patient.³¹

A different nurse described herself as a *paper person* and yet also used the words *template-driven* to describe her work. She said she had found it impossible to combine *getting through it all* with what she regarded as a patient-centred approach. She had negotiated with her employing doctors that her diabetes appointments were 30 min long (instead of 15 min) “otherwise I would have just been completing the boxes with no time for the patient”. In this statement

she highlighted a perceived gap between the task of being ‘for’ the patient and the demands of the template. This nurse went to great lengths to minimise her need to look at the computer during her consultations, seizing brief opportunities as they arose (eg, as patients removed socks). She often placed her left hand on the patient’s arm as she rotated her chair to look at the screen, keeping it there as she typed with her right hand—an awkward posture, but one which allowed her to maintain a physical connection to the patient as she attended to the template. She always went into surgery 30 min before her clinic was due to start, to prepare a written page of notes for each patient in her notebook. She meticulously studied the record of each patient she was anticipating, and copied blood results and other information she thought she may need to refer to. She ‘knew’ the template, and would frequently anticipate the next field in the template before displaying it on the screen, weaving it into the consultation while keeping it relatively ‘invisible’ to patients.

In sociological terms, this particular nurse had internalised the template—working *with it* in a symbolic sense, but marginalising it from her embodied activity in the interaction. Her performed identity was as a ‘paper person’ who preferred to be ‘for’ the patient in this new template-oriented ‘field’^{51 52} of practice, but the template was indeed central to her practice (she was ‘template driven’). She was ‘driven’ in the sense that she ensured that she completed it—as demanded by the institution—but also ‘driven’ to find creative ways of working around it. It had become part of a new professional habitus,^{51 52} which helped to define her normative behaviours and expectations. She took the burden of managing the individual/institutional tension, but in this case it came at an opportunity cost to herself in terms of personal time, and a financial cost to her employer (since her consultations were now taking twice as long).

These examples of exemplary practice are important evidence that the technology is by no means *deterministic* of practices, but that there is always a scope for practitioners to work with technologies in ways which preserve the ‘relational’ aspects of care and maintain full involvement with the patient.⁵³ The electronic record *shapes* but does not *make*; it *constrains* but does not *prohibit*; it *makes possible* but does not necessarily *insist*.

DISCUSSION

Summary of the findings

In this paper, we have focused on the detailed practices of using computer templates in chronic disease management in UK general practice. In particular, we have highlighted the tension between different ways of framing the patient, and the requirement on clinicians (nurses especially) to sustain a dual orientation to both individual patient and institutional imperatives. This pressure to ‘fit’ unique individuals into institutional ‘boxes’ or to weave a bureaucratic process through a

personal encounter^{18 54} is evident at the macro-level of clinic organisation and in the moment-by-moment detail of clinical interaction, even down to the small gestures and nuance of talk. We have argued that electronic templates make a significant contribution to four interrelated phenomena: how disease is defined; how care is delivered; what it means to be a patient; what it means to be a clinician. In other words, the use of templates changes the very nature of what it means to 'care' in the contemporary chronic disease clinic. As we have seen above, 'care' is often reformulated as 'carrying out procedures' and stripped of the relational aspects of the word 'care'. The template can be seen to do *definitional* work.

The template is not just a simple faithful record of what goes on. Nor is it just an aide-mémoire—though it may ensure, for example, that foot pulses are palpated and blood pressures taken (important aspects of diabetes care) and it is quite likely that these will be done in the order set out in the template. The template does not simply identify things which must be done but comes to define what chronic diseases *are*. On one hand, the template is an impoverished 'squeezed in'⁵⁵ record of the encounter. It is where patients' stories morph into bytes of data; the particular becomes generalised; the complex is made discrete, simple and manageable and uncertainty becomes categorised and contained. On the other hand, the template is *integral* to the consultation, and actively shapes what goes on, sustaining normative standards which are realised through consensus and performed daily through social practices. The work of transforming stories into data—and erasing ambiguity—is in itself complex interactional work for both the clinician and patient. However, this does not necessarily constitute the 'complex' response to a 'complex' problem as envisaged by Nolte *et al*, nor does it sit comfortably alongside the political rhetoric of 'nurse empowerment'.^{10 49} This 'new' skilled human work does not appear in the completed template, and seems to go unrecognised—even by those who are engaged daily in doing it.

At no point in our field work did we encounter any suggestion from participants that the care of patients with chronic diseases might be done otherwise. Arguably templates are taken-for-granted as a part of 'good' chronic disease management. Nurses vary in their approaches, and individual nurses used different strategies within and across consultations according to emergent local contingencies. This is unsurprising. The constraints imposed by the template, and the inherent 'rationality–reality' gap²⁹ can be overcome (and our data suggest that they sometimes are) but this demands exceptional creativity. We have described one nurse's collaboration with a patient around the template and another who succeeded in simultaneously *internalising and excluding* the template. However, these examples were unusual, and draw attention to what Blommaert calls "creativity within constraints" (ref. ⁵⁶, p 107), a local

form of creativity which is situated in what he calls "the borderline zone of existing hegemonies...it becomes creative because it is measurable against normative hegemonic standards, because it creates understandable contrasts to such standards" (p 106). It is also important to acknowledge that templates are still a relatively recent introduction to clinical practice and that although they appear to be embedded as part of normative practice, it is possible that some clinicians are still on a learning trajectory with regard to modifying their practices to incorporate these new technologies.

In the institutional account captured through the template, 'care' (specifically 'quality care' as currently incentivised in the QOF) and patients with chronic diseases all start to look the same. Does this matter? One argument goes that as long as the interaction between the clinician and patient facilitates the narrative, the particular, the complex and the ambiguous and this occurs within a therapeutic relationship which supports relational continuity, then it may not matter much. But a close observation of actual practice suggests that, more often than not, nurses are constrained by the linear, instrumental logic of the template with its tendency to privilege biomedical, measurable concerns. The consultation can become a relatively bureaucratic transaction in which patients are shaped into an institutional framework⁵⁵ and meaningful involvement is difficult to sustain.²³ Both nurses and patients experience institutional constraints on what may be talked about and what the chronic disease review can 'be'. Practices become 'regimented'.^{57 58}

Strengths and limitations of this study

A particular strength of this study rests with the sophisticated combination of qualitative ethnographic observation alongside video and screen capture, allowing us to open up the 'black box' of the electronic patient record to detailed scrutiny.³¹ What emerges is a conceptualisation of the electronic record as *integral* to the social processes of consultation, not simply a peripheral 'add-on' to the consultation. Our approach has enabled us to study the subtle complexities of interaction between humans and technologies, while retaining a broad appreciation of the institutions within which these interactions take place.⁵⁹ We have been able to build what anthropologists call a 'thick description'⁶⁰ of the electronic patient record in its social context—combining detailed observational description with analysis and reflective interpretation. It has enabled us to explore working practices at a level of detail that more conventional qualitative methods (such as interviews or semi-structured questionnaires) cannot reach. For example, our focus has been on *actual* social practice rather than on participants' reports alone, and our enquiry has extended into the 'backstage' regions³⁷ of general practice as well as the consulting room. We have been able to highlight the profound influence of the template by drawing eclectically on a broad range of data sources, shifting constantly between 'zooming in' on the

moment-by-moment detail of the consultation, and 'zooming out' to consider organisational practices (what Erickson has called the 'social microscope' and the 'social telescope').⁶¹ This linguistic ethnographic approach offers great potential for the study of complex social practices in contemporary healthcare, including those which incorporate information technologies.

Our approach is time-consuming and resource intensive, and our prioritisation of *depth* of analysis over breadth has meant that we have included only two general practices in this study and these may not be typical of all practices in how they approach either chronic disease management or the use of technologies. Furthermore, both practices used the same clinical system (EMIS LV) and there may be important technical differences between systems. However, as a principle we favoured what Stake has called 'opportunity to learn' over concerns about 'typicality',⁶² and we hope that our work prompts new ways of thinking about the use of templates in chronic disease management. Templates are not unique to the EMIS LV system, and we suspect that our findings may resonate with the experience of many clinicians who are using electronic checklists in the clinic. Although our methodological approach does not allow us to quantify the extent to which clinicians are able to combine a patient-centred approach while meeting the needs of the institution, we have been able to observe a range of practices which highlight the need to think more critically about what is being accomplished through the implementation and use of electronic templates in this context.

Recommendations for policy and practice

Although considerable care is invested in ensuring the diligent use of electronic templates in general practice, much less attention is paid to how these are actually used by clinicians, or to the possibility that incorporating a template might profoundly change the way in which care is 'enacted' by professionals, and experienced by patients.

Ostensibly the data recording necessary for institutional processes such as the QOF emerges effortlessly from regular clinical care, and serves to improve the quality of care. Our data show that paradoxically, the focus on what is measurable and recordable in templates, and designed to assure certain standards of 'quality' care (such as those identified in the QOF) can lead to a bureaucratisation of care and may serve to marginalise those aspects of 'quality' practice which lie beyond their focus, and which do not lend themselves to 'data capture'. These include—but are not limited to—the extent of the patient's opportunity to construct their narrative and the extent to which the clinician and patient are fully 'involved' in the interaction. Arguably these may well be aspects of care which mark out 'quality' care from 'minimum to be expected' care. While incentivising clinicians may well result in better data quality it should not be assumed that the quality of

care (in its most holistic sense) improves, although the care of the patient may be profoundly changed.

We suggest that in educating for chronic disease management, it is essential to incorporate a greater recognition of the way in which clinicians integrate the electronic patient record and to regard this as an integral aspect of the consultation. The rational institutional logic inherent in the template does not align easily with the complexity of emergent dialogue between the clinician and patient and it seems unlikely that minor adjustments to the design of template fields would address the communication challenges that we have identified in our research. However, it is essential that clinicians grasp fully the importance of the dialogue and learn ways of responding dynamically, creatively and individually to particular patients' concerns so that the patient's unique experience is not overshadowed by institutional imperatives. Although we have identified examples of these practices as 'exceptional' (p 15), it is in these exceptional practices that we suggest there is considerable scope for optimism in the face of increasing technologisation of care. The challenge for clinicians and educators is to appreciate that the incorporation of templates and other technologies renders the consultation *more complex* rather than *less complex*...and hence this is worthy of explicit educational attention. We would also urge a shift towards models of care delivery which embrace multimorbidity as the norm and which seek to embrace the complexity of this reality in primary care, while still allowing appropriate data capture to inform the evidence-based management of specific diseases.

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REFERENCES

1. Wagner E, Austin B, Von Korff M. Organising care for patients with chronic illness. *Milbank Q* 1996;74:511–44.
2. Ham C. The ten characteristics of the high-performing chronic care system. *Health Econ Policy Law* 2010;5:71–90.
3. Greenhalgh T, Potts HWW, Wong G, *et al*. Tensions and paradoxes in electronic patient record research: a systematic literature review using the meta-narrative method. *Milbank Q* 2009;87:729–88.

4. Black AD, Car J, Pagliari C, *et al*. The impact of eHealth on the quality & safety of health care: a systematic overview. *PLoS Med* 2011;8:e1000387.
5. Monteiro E, Hepsø V. Purity and danger of an information infrastructure. *Systemic Practice and Action Research* 2002;15:145–67.
6. Department of Health. Improving chronic disease management. http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4075213.pdf. 2004. (accessed 4 Nov 2012).
7. Singh D, Ham C. *Improving care for people with long term conditions: A review of UK and international management frameworks*. Birmingham: NHS Institute for Innovation and Improvement; University of Birmingham, 2006.
8. Berg M. Implementing information systems in health care organizations: myths and challenges. *Int J Med Inform* 2001;64:143–56.
9. General Practitioners Committee. Quality and Outcomes Framework. Guidance—Updated August 2004. http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4088693.pdf. 2009.
10. Nolte E, Knai C, McKee M. Managing chronic conditions: an introduction to the experience in eight countries. In: Nolte E, Knai C, McKee M, eds. *Managing chronic conditions*. European Observatory on Health Systems and Policies; 2008;1–14.
11. Guthrie B, Saultz JW, Freeman GK, *et al*. Continuity of care matters. *BMJ* 2008;337:a867.
12. Roland M, Campbell S, Bailey N, *et al*. Financial incentives to improve the quality of primary care in the UK: predicting the consequences of change. *Primary Health Care Res Dev* 2006;7:18–26.
13. Watt G. Blue sky research for primary care: a discussion paper. <http://www.sapc.ac.uk/images/documents/blue.pdf>. Society for Academic Primary Care, 2011. (accessed 4 Nov 2012).
14. Fortin M, Soubhi H, Hudon C, *et al*. Multimorbidity's many challenges. *BMJ* 2007;334:1016–7.
15. The NIHR School for Primary Care Research. http://www.nihr.ac.uk/research/Pages/programmes_primary_care_research.aspx, 2012. (accessed 4 Nov 2012).
16. Rhodes P, Langdon M, Rowley E, *et al*. What does the use of a computerized checklist mean for patient-centred care? The example of a routine diabetes review. *Qual Health Res* 2006;16:353–76.
17. McDonald R, Harrison S, Checkland K, *et al*. Impact of financial incentives on clinical autonomy and internal motivation in primary care: ethnographic study. *BMJ*, doi:10.1136/bmj.39238.890810.BE (published 17 May 2007).
18. Checkland K, McDonald R, Harrison S. Ticking boxes and changing the social world: data collection and the new UK general practice contract. *Soc Policy Administr* 2007;41:693–710.
19. Edgar A. The expert patient: illness as practice. *Med Health Care Philos* 2005;8:165–71.
20. Frank A. *The wounded storyteller: body, illness, and ethics*. Chicago: University of Chicago Press, 1995.
21. Kleinmann A. *The illness narratives: suffering, healing and the human condition*. New York: Basic Books; 1988.
22. Strauss AL. *Chronic illness and the quality of life*. St. Louis: Mosby; 1975.
23. Goffman E. *Involvement. Behavior in public places*. New York: The Free Press; 1966, 33–42.
24. Berger J, Mohr J. *A fortunate man; the story of a country doctor*. Harmondsworth: The Penguin Press, 1967.
25. Heath I. *The mystery of general practice*. Nuffield Provincial Hospitals Trust, London, 1995.
26. Charon R. Narrative medicine: form, function, and ethics. *Ann Intern Med* 2001;134:83–7.
27. Greenhalgh T, Hurwitz B. Why study narrative? *BMJ* 1999;318:48–50.
28. Balint M. *The doctor, his patient and the illness*. 2nd edn. Edinburgh: Churchill Livingstone, 1964.
29. Heeks R, Mundy D, Salazar A. *Why health care information systems succeed or fail*. Manchester: University of Manchester, Institute for Development Policy and Management, 1999.
30. Berg M. *Health care work and patient care information systems*. In: *Health Information Management—integrating information technology in health care work*. London: Routledge, 2004, 45–64.
31. Swinglehurst D, Roberts C, Greenhalgh T. Opening up the 'black box' of the electronic patient record: a linguistic ethnographic study in general practice. *Commun Med* 2011;8:3–15.
32. Berg M. Of forms, containers, and the electronic medical record: some tools for a sociology of the formal. *Sci Technol Human Values* 1997;22:403–33.
33. Berg M. Practices of reading and writing: the constitutive role of the patient record in medical work. *Sociol Health Illness* 1996;18:499–524.
34. Timmermans S, Berg M. *The gold standard: the challenge of evidence-based medicine and standardization in health care*. Philadelphia: Temple University Press, 2003.
35. Harré R. Material objects in social worlds. *Theory Culture Soc* 2002;19:23–33.
36. Swinglehurst D, Greenhalgh T, Myall M, *et al*. Ethnographic study of ICT-supported collaborative work routines in general practice. *BMC Health Serv Res* 2010;10:348.
37. Goffman E. *Regions and region behaviour. The presentation of self in everyday life*. London: Penguin Books, 1959:109–40.
38. Green J, Thorogood N. *Qualitative methods for health research*. London, CA, New Delhi: SAGE Publications Ltd, 2004.
39. Rampton B, Tusting K, Maybin J, *et al*. UK linguistic ethnography: a discussion paper. <http://www.ling-ethnog.org.uk/documents/papers/ramptonetal2004.pdf>. 2004. (accessed 4 Nov 2012).
40. Roberts C, Sarangi S. Theme-oriented discourse analysis of medical encounters. *Med Educ* 2005;39:632–40.
41. Atkinson JM, Heritage J. Transcript notation. In: Atkinson JM, Heritage J, eds. *Structures of social action: studies in conversation analysis*. Cambridge: Cambridge University Press, 1984:ix–xvii.
42. Jewitt C. *Towards a multimodal analysis. Technology, literacy and learning: a multimodal approach*. Abingdon: Routledge 2006;32–52.
43. Goodwin C. Professional vision. *Am Anthropol* 1994;96:606–33.
44. Blommaert J. *Sociolinguistic scales*. Working Papers in Urban Language & Literacies, Paper 37. London: Institute of Education, 2006.
45. Sarangi S, Slembrouck S. The pragmatics of information exchange in bureaucratic discourse. In: Sarangi S, Slembrouck S, eds. *Language, bureaucracy & social control*. Harlow: Addison Wesley Longman Limited, 1996:17–35.
46. Roberts C, Sarangi S, Southgate L, *et al*. Oral examinations—equal opportunities, ethnicity, and fairness in the MRCGP. *BMJ* 2000;320:370.
47. Wagner E, Austin B, Von Korff M. Organising care for patients with chronic illness. *Milbank Q* 1996;74:511–44.
48. May C, Rapley T, Moreira T, *et al*. Technogovernance: evidence, subjectivity, and the clinical encounter in primary care medicine. *Soc Sci Med* 2006;62:1022–30.
49. Department of Health. Liberating the talents: helping primary care trusts and nurses to deliver the NHS plan. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4007473. 2002. (accessed 4 Nov 2012).
50. Charles-Jones H, Latimer J, May C. Transforming general practice: the redistribution of medical work in primary care. *Sociol Health Illness* 2003;25:71–92.
51. Bourdieu P. *Outline of a theory of practice*. Cambridge: Polity, 1977.
52. Bourdieu P. *The logic of practice*. Cambridge: Polity, 1990.
53. Goffman E. *Involvement. Behavior in public places*. New York: The Free Press, 1966:33–42.
54. Roberts C, Campbell S. Fitting stories into boxes: rhetorical and textual constraints on candidates' performances in British job interviews. *J Appl Linguist* 2005;2:45–73.
55. Douglas M. *Institutions do the classifying. How institutions think*. New York: Syracuse University Press, 1986:91–109.
56. Blommaert J. *Choice and determination. Discourse: key topics in sociolinguistics*. Cambridge: Cambridge University Press; 2005:98–124.
57. Blommaert J. *Discourse*. Cambridge: Cambridge University Press, 2005.
58. Blommaert J, Collins J, Slembrouck S. Polycentricity and interactional regimes in 'global neighbourhoods'. *Ethnography* 2005;6:205–35.
59. Greenhalgh T, Swinglehurst D. Studying technology use as social practice: the untapped potential of ethnography. *BMC Med* 2011;9:45.
60. Geertz C. *Thick description: toward an interpretive theory of culture. The interpretation of cultures*. New York: Basic Books, 1973:3–30.
61. Erickson F. *Talk and social theory*. Cambridge: Polity, 2004.
62. Stake RE. Qualitative case studies. In: Denzin NK, Lincoln YS, eds. *The sage handbook of qualitative research*. 3rd edn. Thousand oaks, London, New Delhi: Sage Publications, Inc, 2005:443–66.

APPENDIX

Table A1 Transcribing conventions, adapted from Atkinson and Heritage⁴¹

[onset of overlapping speech	.hhh inbreath
] end of spate of overlapping talk	Hhh outbreath
[[speakers start a turn simultaneously	= no pause between speakers; contiguous utterances
: preceding sound is lengthened or drawn out	(()) a non verbal activity (eg, C = keystroke in this work)
(more : means greater prolongation)	
Underlining emphasis	(text) unclear fragment of text
(.) pause of less than 0.2 seconds	. falling tone (not necessarily end of sentence)
(0.4) pause, in tenths of a second	? rising inflection (not necessarily a question)
↑↓marked rising / falling intonation	CAPITALS louder than surrounding talk
>text< the talk they surround is quicker than surrounding talk	<text> the talk they surround is slower than surrounding talk
°° the talk they surround is quieter than surrounding talk	