



WEB PUBLICATION

**THE SOCIAL IMPLICATIONS OF
PRESCRIBING USING DIGITAL TECHNOLOGIES**

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1 Report Findings

1.1 Summary

The Department of Health Policy Research Group has commissioned this study from Tremblay Consulting.

The result is a “think piece” about social implications likely to arise from the introduction of a system for the electronic transmission of prescriptions [ETP] in England.

This study is not focused on the technical aspects of ETP; this work has been undertaken separately, hence this report’s focus on prescribing, patients, ways of working and institutional relationships. The study touches on a variety of issues to map implications and expands some issues more than others but always with a view to balancing comprehensiveness with a report that is accessible to readers.

To make some sections more self-contained, there is some repetition of content.

1.2 Overarching policy research issues

Throughout the report, specific policy research issues are identified (and summarised in the table in this section). Overarching policy research issues exist, which set the context and focus more generally for e-prescribing.

This study can contribute to an understanding of the implications of ETP as well as contribute more widely to assessing the social implication of change arising from information technology in the NHS.

It would be productive to review the findings with key Department of Health staff concerned with ETP at a policy level and in terms of implementation within the NHS. Wider stakeholder discussions may be appropriate given the suggested potential scope and impact. This would contribute to the understanding of social implications considerably.

The potentially disruptive influences of ETP, put into the context of social impact assessment, offer the Department of Health the opportunity to review the current structure of the services available to patients from pharmacies, and in particular assess whether and to what extent ETP provides a basis for more services from community pharmacy. These would be anchored around the ETP datastream and the possibility of real-time decision-making with patients about medicines and their health care.

It is relevant to policy-makers to accommodate the social impact of technologies which have the broad effect of moving from the narrower notions of telemedicine, through telehealth to an increasingly location independent and real-time health service.

It also offers the Department the opportunity to assess methods of implementation of ETP to ensure that the widest possible benefits are achieved.

Across the facets of the patient's journey and the structure of the health chain as it pertains to prescriptions a variety of potential implications can be surmised for further assessment.

It is recognized that policy-making to be effective needs to have specific characteristics, such as:¹

- designing policies around outcomes
- making sure policies are inclusive, fair and evidence-based
- avoiding unnecessary burdens on businesses
- involving others in policy-making
- becoming more forward and outward-looking
- learning from experience.

From the perspective of this impact assessment, the following are suggested as key policy research issues which need further study and integration into policy making.

1.2.1 The patient's experience of service

It is likely that further development of electronic prescribing will encompass a variety of additional capabilities, with further implications for health professionals, patients, policy-makers and participants in the health care value chain such as providers and the pharmaceutical and IT industries. It would seem appropriate to consider what institutional arrangements would be appropriate to ensure effective further development of ETP, particularly to take account of the following:

- Emergence of new forms of errors in an electronic prescribing environment with implications for patients.²
- The structure of the health care industry taken as a whole and how it interacts with patients.
- Changing dispensing patterns with implications for patient compliance and ways to enable concordance.

In addition, research supports the view that some people benefit more than others from access to the health system, and this extends into the few minutes' encounter between doctors and patients where these expectations are set and agreed. E-prescribing will intrude into these few minutes when prescribers discuss prescribing options with patients. This offers new opportunities to resource and support individual patients by engaging them more fully in the doctor/patient relationship. Efforts to enhance health literacy in this context may produce considerable benefits. There is some evidence on patient/doctor expectations regarding medicines, and little on the potential role of pharmacists and other emerging prescribers.

Table 1: Policy Research Questions	
Section	Policy research question
4.3	What is the impact of ETP on the clinical encounter between clinicians and patients and more generally on the structure of prescribing narrative, in the context of implications for patient choice, the application of clinical judgment, and the use and role of prescribing guidelines that may influence patient choice?
4.5	How can policy encourage greater cooperation between prescribers and pharmacists in the context of reducing adverse consequences on patients arising from poor compliance or problems utilizing the benefits of e-prescribing systems?
4.6	How can e-prescribing influence the redesign of prescribing for vulnerable individuals, particularly older people and those in nursing homes as top priorities?
4.7	What programme of support is necessary to deal with patients who are often higher cost and higher utilization and are therefore at greater risk from the problems associated with polypharmacy, such as drug combinations, dosage, and medicines review/utilization?
5.1	Is it desirable that a national system of ETP integrate all medicines that patients are prescribed or choose to take (over the counter and pharmacy only, from any prescriber, whether a doctor or dentist, or public or private) or should it only deal with NHS prescriptions?
5.3	Are current restrictions on providing information on prescription medicines to patients appropriate given the priority on increasing public understanding of health, and enabling greater patient choice?
5.4	<ol style="list-style-type: none"> 1. What is the function of dispensing doctors in an e-prescribing system? 2. How can a more effective system be enabled which helps patients deal with repeat prescribing, and in particular is the existing system appropriate to an e-prescription environment? 3. How can e-prescribing enable a more effective system of reminding patients about their medicines?
6.1	Should 3 rd party chronic disease management programmes (or similar) be encouraged as a component of the further development of e-prescribing?

1.2.2 Better policy-making

ETP is 21st century health care in the womb. Policy-making following implementation of ETP and related initiatives will need to move beyond the initial technical specification toward a more inclusive view. ETP has been presented as an internal solution to an NHS productivity problem, but has been found to be a potential disruptor of existing approaches across both the health care value chain and the patient's perception of care and their journey through the health system.

As always, more focused policy-oriented and implementation based research will need to be done. There is a tiny research base on electronic prescribing but the United States, Denmark and Sweden are in the vanguard, and continuing to make progress, and other countries are implementing solutions to health problems, without the same legacy considerations that prevail in the UK. Learning from these can be helpful across a wide spectrum.

It is clear that the outcomes of ETP are much more than just the automation of a paper process. The development of ETP will need to take account of the interests of much larger group of social stakeholders, reflecting commercial interest in the value of the real-time data produced through to the considerable potential benefit that may be realized through development of new forms of health service delivery. This has implications on the 'rules' that apply to the way the health economy works as a whole.

The developments to encourage a mixed economy of health provision suggest that ETP offers a new entry point for new or existing providers to engage in efficacious ways with patients.

Table 1: Policy Research Questions	
Section	Policy research question
4.1	To what extent can information technology in health for use in the NHS be assumed to be benign with respect to social impact, and what is our understanding of the potential external impact on society and patients of such implementation of 'internal' systems in the NHS?
4.4	How can the policy priorities focused on developing the role of the pharmacist be developed in harmony with the commercial context in which pharmacies operate, and which engages the commercial sector collaboratively in that development, particularly taking account of the impact policy implementation can have on the health care value chain?
5.2	Are current legal and other guidance on professional responsibilities compatible with greater flexibility in skill mix in pharmacy?
5.5	Is there learning from other national jurisdictions on implementation of ETP systems to inform the successful development in England?

Table 1: Policy Research Questions	
Section	Policy research question
7.2	What should be the impact of health policy development and implementation, and health systems regulation, in the ETP context, on the structure and operation of the health care value chain?
7.3	Are the OFT's conclusions on community pharmacy altered when a fully functional e-prescribing system is taken into account?
8.1	How is exclusion to be understood in the information society, and in what way should such a definition support policy priorities toward medicines management and ETP?
8.2	How can policy-makers anticipate the likely impact on society and patients of further development of e-prescribing, into the future, in a way which ensures that policy remains relevant and appropriate to the changing fabric of society?

2 Understanding electronic prescribing

Health systems are complicated, and medicines a particularly important component. Large numbers of the public receive and use medicines daily. Doctors, nurses and pharmacists, hospitals and clinics across the health system (both public and private) are concerned about costs of medicines, their proper use, and implications for their patients.

The UK's pharmaceutical industry is one of the most productive and creative in the world, and contributes considerably to both the health of citizens and the economy through export sales, and expenditure on research and development. The whole health industry sector employs around 7% of the UK workforce, in what are some of the most highly qualified jobs in the economy, and accounts for about 13% of GDP.

A change in any part of the health system cannot immediately be assumed benign, and therefore, it is appropriate to consider the social implications of any changes. ETP is particularly important since it will involve every pharmacy and doctor in England, and affect every single patient who receives a prescription.

2.1 Why electronic prescribing?

There are many factors which support the introduction of a system of electronic prescribing:

- A significant number of health problems arise from avoidable medication errors. This is compounded by the increasing potency of medicines. Better management of medicines is needed, starting with more efficient capture of prescribing data.
- Doctors and pharmacists are busy and ways to improve productivity are badly needed. This means we need to look at ways to speed up and improve prescription processing, eliminate steps which consume time and resources without adding any benefit.
- Patients are demanding more and better service from public health providers. This reflects the public's experience of their wider world, where choice, individual service and convenience prevail.
- The ageing population is known to be at greater risk from medication error, complex prescribing and polypharmacy. Significant opportunity exists to reduce avoidable health problems through better management of prescribing just for this group of people.
- Boundaries between professionals are changing and prescribing authority is being extended to other health professionals. This points to the need to ensure much greater integration of information on prescriptions and prescribing.

US research has identified³:

1. Doctors in particular are benefiting from improved medicines management.

2. The pharmaceutical industry benefits through improved access to prescribing data (and the corresponding greater potential use of e-detailing).
3. Patients are seen to benefit or be affected largely indirectly in the context of safety. Other research points to implications across the whole spectrum of the patient's experience of care.

Thus, research to date has identified the main benefits of electronic prescribing:

- Improved safety of the prescribing process,
- Reduced costs through improved efficiencies,
- Improved sources of advice to prescribers,
- Improved sales and marketing of medicines.

2.2 Assessing social implications

The assessment of social implications of policy implementation is designed to identify, in advance, the social consequences that flow from policy actions or projects, and encompass as much as possible all social or cultural consequences to people in terms of how people live, work, play, relate to each other or organize themselves. Importantly, assessment includes both psychological and health effects, and the experiences of people, as well as communities. In this respect, assessment is focused on what is experienced or perceived by people; this is quite separate from economic or technical aspects.⁴

It is important to take into account a world wider than what is often immediately measurable. Raff⁵ has pointed out that “effects are not to be disregarded because they are difficult to identify or quantify.” Additionally, people (including policy makers) respond to possible changes by becoming apprehensive of what *might* happen, and reacting to “imagined scenarios”, whether based in fact or not. This can be challenging to policy implementation but is often the basis from which organized and coordinated resistance or objections to policy flow.

2.3 Social impact and the disruptive potential of innovations

Why could or should e-prescribing have any social impact, or be a disruptive influence?

2.3.1 The creation of a datastream

ETP creates an unbroken chain of information -- a datastream -- which does not involve any handoffs or rekeying of data once initiated by the doctor and maintained by the pharmacist. The creation of this datastream involves a variety of implications for people and which have considerable patient, professional, public health and commercial interests. These are different in many respects from considerations that exist in a paper system. This datastream can be accessed in real-time to gather data which has largely originated in paper form.

Brown and Duguid⁶ in their study of the social aspects of information observe that what under a pre-technology regime are seen as constraints are converted into resources by information technology. Their conclusions are relevant to ETP, which while perhaps narrowly conceptualized as an “e-script” in a professional exchange between doctor and pharmacist, has a much larger social life.

Burns⁷ in his study of the US health value chain observes that IT has generally failed to deliver benefits into health care systems that translate into productivity gains, cost reductions and service improvements. The root cause in his US-focused study is a lack of understanding of the value of information; the result is that meaningful (value-creating) information is not shared across the value chain.⁸

The creation of real-time, point-of-use prescribing information will virtually demand the redesign of the whole information flow and impact relationships between the various actors within the health system, from patients to suppliers. This will create new opportunities and relationships. And this is the disruptive potential.

It is, therefore, appropriate to assess ETP in the context of both the health care value chain (as best we can understand it) and the patient’s journey and these two interact.

2.3.2 Disruptive influences and tipping points

Is the patient, perhaps, the real disruptive influence?

This review of the impact of ETP has also considered the organisational and policy context into which ETP will be introduced. NHS information system priorities include electronic booking of appointments, and electronic health records, both of which will alter the patient’s perception of NHS service, and in many cases, particularly with respect to health records clearly introduce new elements.

2.3.2.1 Driving quality

Patient involvement in the NHS is increasingly shifting from that of a service recipient to an active shaper of service structure. In shaping services around the patient or health consumer more generally, improved ‘health literacy’ is needed to support informed choice.

Why, though, if health care is so important to everyone, quality and service are often so bad.⁹ Additional research has suggested that health care systems have failed to benefit from productivity gains since the focus of attention has been on achieving excellence in the technical dimension of care, not health care as received by the patient.¹⁰ This is one way of saying that the implementation of enabling technology has been driven by needs internal to health care delivery systems to improve technical performance, and not driven by needs external to the health system to improve service quality as perceived by the patient and user. Other industries have redesigned their internal systems through a focus on external service delivery, by engaging the customer in driving service quality expectations and standards back into the organisation. It is a basic principle of service redesign to start with the external user and derive service quality from that perspective.

This means that only when patients are consumers of ETP will the full benefits of ETP be realized.

2.3.2.2 A “Tipping Point”?

Much research has been undertaken on the implications of non-linear social change. The implications of ETP as they extend beyond the technical dimension suggest that the work of Mark Granovetter may be applicable. He put forward the notion of the ‘strength of weak ties’¹¹ to explain why little things can make something larger happen.

This work has been popularized by Gladwell¹² who attempts to synthesise selected research on social change. He proposes a more generalised model for understanding the dynamics of social processes and sudden changes or shifts in behaviour or social outcomes based on the accumulation of small influences. The ‘tipping point’ is the moment of specific sensitivity to a critical mass of people, or the threshold beyond which new behaviour prevails. The notion of the tipping point is established in epidemiology as it describes the shift in an illness from a localized or individual condition into an epidemic, where different rules apply to the spread of illness.

Is there a tipping point relevant to the potential social impact of electronic prescribing? Certainly ETP appears to be something minor, potentially affecting a large number of people. But it is the context of implementation of ETP that is particularly relevant here, namely the policy objectives of increasing personal choice, enabling access, improving quality and enfranchising users in the NHS. ETP is part of a range of initiatives in the NHS that together may have the collective effect of altering the patient’s experience of NHS service and care and thus provide the basis for a wholesale realignment of the public’s view of the NHS.

Could ETP alone create the necessary conditions?

Or is it, among any one of the many other NHS IT initiatives, likely to be the one factor which tips the NHS into achieving these policy outcomes? If so, it is clearly necessary to understand the dynamics of system change through IT *from outside the NHS itself*, so that the changes being driven internally take account of their impact, since they are likely to be driven by patients.

In the United States, a health care information development has recently been described as a tipping point where Secretary of Veterans Affairs Anthony J. Principi said:

Putting health information standards in the public domain [the national availability of SMOMED] and promptly adopting health information standards for the federal health partners, is the ‘tipping point’ for national standards that strengthen our electronic health record systems, help optimize our health care, and, most importantly, improve the health of veterans as well as all of the people of the U.S.¹³

It seems that the main implications are therefore likely to flow more from the information and its social consequences, than from specific aspects of technical design. This suggests, too that there may be implications for choice of methods used for implementation of information technology systems in the NHS.

2.4 Are patients the disruptive influence?

Would, therefore, patients, the public users, supported by improved information and increased decision-making about their care, emerge as the disruptive influence?

This would be compatible with the priority to re-fashion the NHS around the patient. Indeed, it may be that this major refocus will not be obtained unless and until patients become the major ‘users’ of health sector innovation.

In respect of ETP, an e-script is not the same as a paper script. Consider that the paper script involves a process in the doctor’s office – perhaps a mysterious process to many – but obviously something only the doctor can do. Issuing an e-script may appear to the patient as something not particularly different from their experience at the bank or store – and thereby less mysterious, or at least more familiar.

The attendant discussion on where the patient would like the e-script to go may now create the impression that the system is there for the patient, not doctor. The doctor, instead of handing over a prescription, is now consulting the patient about their preferences. It is this redesign shift toward the end users that has driven quality and productivity improvements in other sectors. ETP may achieve a similar shift from patients to so-called medical end users.¹⁴

Similarly, this shift rebalances power relationships – the doctor now is obliged to know how the patient will get the prescription fulfilled, not just be concerned with getting the right medicine prescribed.

2.5 A note on research methods

Literature reviews were undertaken on Medline to identify relevant clinical and related research. Interviews with UK stakeholders were not held in keeping with the objectives of this paper to provide an insight into issues and areas to guide subsequent Departmental consultation and discussion with the wider community.

Countries where electronic prescribing systems are in use include Denmark, Sweden and various US states – New Jersey and Rhode Island are notable examples. An overview of the Swedish system was obtained from telephone interviews with Apoteket, the state pharmacy monopoly which has undertaken considerable research on the social implications of electronic prescribing.¹⁵ Contact with other jurisdictions – New Jersey and Denmark – was initiated but was unable to be concluded in time for reporting at this time.

3 Structure of the report

This study focuses on users, primarily patients, for whom the prescription exists in the first place, the general practitioner/prescriber who initiates the prescription and the pharmacist who fulfils the prescription, and the contexts in which all this happens. Linked to each of these groups are other stakeholder groups with an interest in ETP, and of course influences amongst these main actors. This study expands on these various interests through a patient’s journey (linking the three primary groups).

It is also relevant to explore the patient/user experience with what might be happening across the health care value chain¹⁶, in particular to identify potential implications that may flow from changes in value chain relationships on patients and users. In this respect it becomes possible to identify direct implications for people of e-prescribing, and indirectly from the potential implications for change within the structure of the health care market. The role of government policy in influencing the structure of the market, and the patient's experience of care through the patient journey are another key factor.

This approach takes into account unique features of the social implications of automation – in effect, ETP automates a paper process by creating an unbroken chain of information, which in itself may create a disruptive influence, and with its own potential implications to be accommodated.¹⁷

The social implications extend beyond the implementation of the technology. Assessment of policy making and implementation for digital times is in its infancy¹⁸. The potential scope of impact from introduction of information technologies is being progressively better understood.

The following are the areas where social implications are most likely to arise and which form the structure of this report in the indicated sections.

- Relationships between people¹⁹ [Section 4]
- Knowledge utilisation²⁰ and ways of working²¹ [Section 5]
- Perceptions of personal power and control²² [Section 6]
- Boundaries between groups or organizations²³ [Section 7]
- Perceptions of distance and geography.²⁴ [Section 8]

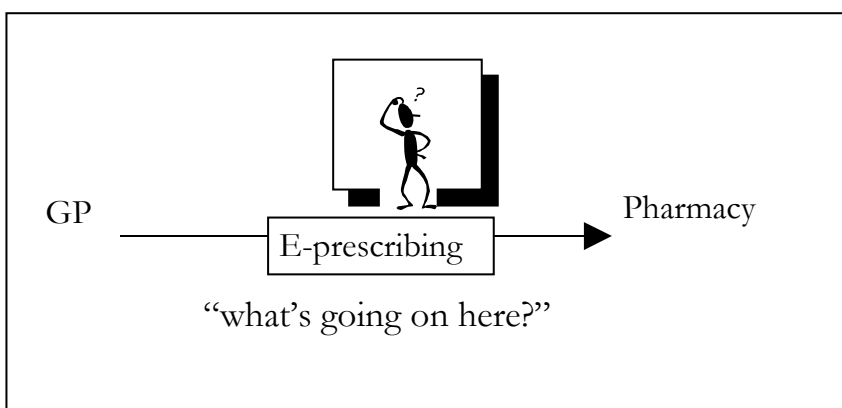
4 Relationships between people: the social structure of prescribing

The patient’s encounter with the health system involves many health professional groups. ETP links doctors or prescribers and pharmacists. It is important therefore to understand the potential impact here.

4.1 The social structure of prescribing

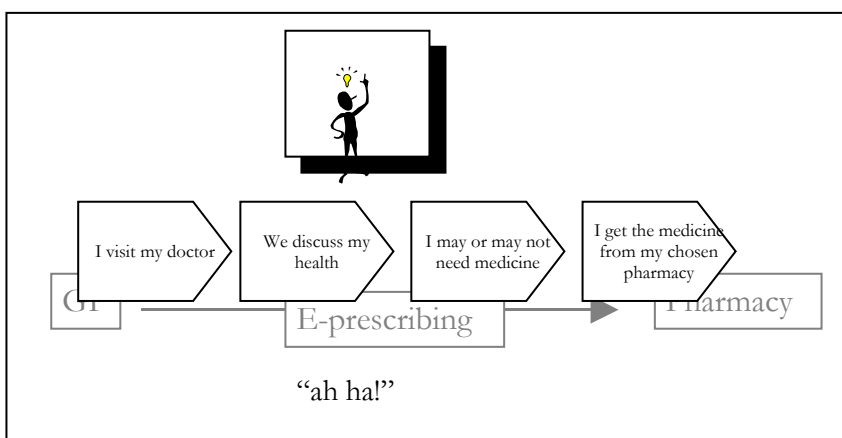
There are two ways to look at electronic prescribing: the technical way...

Diagram 1: where is patient understanding in the purely technical aspects of electronic prescribing?



...or the patient focused way...

Diagram 2: Focusing on the patient’s understanding yields a different perspective



4.1.1 Policy research question

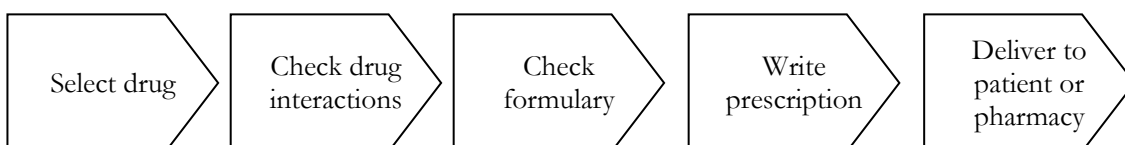
To what extent can information technology in health for use in the NHS be assumed to be benign with respect to social impact, and what is our understanding of the potential

external impact on society and patients of such implementation of ‘internal’ systems in the NHS?

4.2 The prescription in practice

ETP automates the existing paper-based process of prescribing. The diagram summarises what the doctor does or should do in this process.

Diagram 3: The prescription process



Arising from this process are various issues which affect patients and the likely benefit from ETP.

The sources of impact arise mainly from the reduction of errors, and the corresponding potential impact on compliance, accuracy and reliability.

Table 2: Problems and ETP impact	
Source of problem	Impact of ETP
The doctor may err in drug selection.	Should be linked to clinical decision support system to ensure this does not happen
Potential for drug-drug interaction.	
Formulary error with unapproved drug.	
Prescription illegible, spelling error, dosage error.	Assuming accurate order entry (and checking by decision support system) this should be significantly reduced.

The potential patient benefits, therefore, include:

- Reduction in medication errors, adverse drug reactions, adverse drug-drug interactions
- Overall improvement in safety and security of the process of choosing a medicine and ensuring that the chosen medicine/dose is what is ultimately dispensed.

The potential benefits to pharmacists include:

- Reduction in illegible prescriptions²⁵
- Reduction in dispensing errors.

4.3 The patient's perception of care and the clinical encounter

The doctor-patient relationship is a fundamental construct within any health system, and has been subjected to considerable study.²⁶ Of particular interest is this relationship in the context of prescribing and what influences are at work. Some research views the relationship in the context of the control of costs and managing patient expectations. Patients sometimes expect a prescription and sometimes do not, while doctors are always alert to the prescribing option, based on their knowledge of medicines.

Stevensen et al²⁷ reported that GPs said their decisions to prescribe were informed by a concern to maintain a good relationship with the patient; they also reported that they would not put at risk a good relationship by not prescribing when they thought a prescription was expected. The interesting conclusion the authors draw is that patient demand for prescriptions may be overestimated by GPs, perpetuated by their beliefs that such demand exists and is important in maintaining a good doctor-patient relationship. This finding is supported by Britten and Ukoumunne²⁸ who looked specifically at patient expectations of a prescription. They concluded that doctors' perceptions of patients' expectations of a prescription were influential, and outweighed the patient's expressed expectations.

Dowell et al²⁹ reported patients were willing to accept changes in types of medications prescribed as a response to financial pressures within the practice (under the fundholding regime). Patient acceptance, particularly those on long-term medication regimes, however, was closely linked to the quality of communication from the GP on the need for the changes. Communication patterns in the doctor-patient relationship reflect, as does this study, the agency model, with the doctor acting as the agent for the patient in respect of decision-making for what are seen as uninformed clients. However, as Steinke et al³⁰ conclude, the decision to prescribe and the patient's decision to accept a prescription is complex and with informed patients may not apply.

The patient could after all refuse to accept the prescription, as many patients do not fill the prescription once given; could that be an example of the patient not wanting to disappoint the doctor who they perceive as wanting to give them a medicine? The patient-focused literature suggests that patients often perceive doctors as wanting to give them a prescription, and that doctors were perceived as overprescribing due to work pressures. GPs appeared to underprescribe with patients who wanted more help with their symptoms.³¹

At a fundamental level, e-prescribing introduces into the doctor-patient encounter psychodynamic elements which have only just been understood in the context of the influence of patient access to health information from the internet. This may lead to a recasting of the relationship in terms of its narrative structure, and power relationships.

As noted above, doctors will now be obliged to determine where the patient will get the prescription filled which raises a constellation of linked issues around the candour of the relationship, and mutual expectations about a prescription.

Many questions naturally arise but which are outside the research base and for which additional work is appropriate, such as:

- Will patients be more attentive to the discussion on medicines and the choice of medicines?
- Will patients be more candid about their likely compliance and concordance, or even whether they want the prescription?

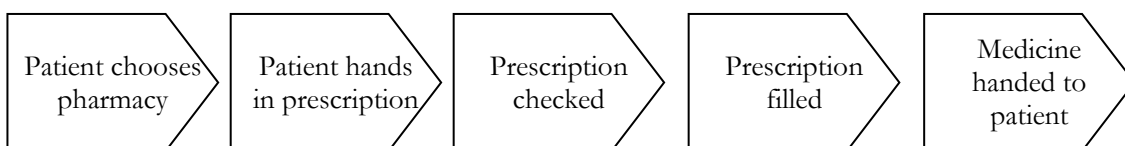
4.3.1 Policy research question

What is the impact of ETP on the clinical encounter between clinicians and patients and more generally on the structure of prescribing narrative, in the context of implications for patient choice, the application of clinical judgment, and the use and role of prescribing guidelines that may influence patient choice?

4.4 The patient's perception of care and the pharmacy encounter

The patient's encounter with the pharmacist is predicated on the presentation of a prescription.

Diagram 4: the fulfilment process



The in-pharmacy component of the current system involves the following additional activities:

- Confirmation of patient eligibility for exemption from the dispensing fee,
- Confirmation of identity where doubt exists or where the medicine is for another person.

The patient may also have these waiting experiences:

- To hand-in the prescription
- To receive the medicines
- To return at another time as the pharmacy does not have the required medicine
- The pharmacy is not open at a time convenient to the patient.

The Prescription Pricing Authority has reported³² that in the 6 months ended March 2003, 34,249 penalty notices had been issued to patients for fraudulently claiming exemption from prescription charges, with 1,655 involving the courts. ETP should eliminate this process.

The benefit would be the elimination of the potentially contentious encounter in a public place between the pharmacist and the patient over eligibility, and thus a net reduction in sources of potential conflict and tension. This has the additional benefit of eliminating this time from the fulfilment process, and thus either reduce the queuing length or time, or offering substitute time to engage in more relevant discussions on the medicines themselves.

There may be some commercial benefits to pharmacists as queuing for prescription fulfilment is hardly something that they would value, and may be avoided by patients who may either defer the time to fill the prescription – and thus potentially never fill it – or go to another pharmacy – which may help the patient, but undermine efforts to position pharmacists as a valuable resource, since the way to the pharmacist is through the prescription.

Additionally, few pharmacies have space for a waiting area which further encourages patients not to wait. From the pharmacies' perspective, their inability to retain patients in the pharmacy to fill a prescription may impact sales of other products; while this has a commercial dimension, from the patient's perspective, this further fragments their experience of the prescription fulfilment process.

Some pharmacies currently offer a pick-up and home delivery service, and some provide telephone services. The findings from the ETP pilots³³ suggest that the telephone plays an important role which may not be fully understood. Very few GPs accept telephone calls from patients with respect to renewal of prescriptions; indeed, it may be that it is actively discouraged. Within the ETP pilots, the Pharmacy2U service involved a telephone-based process to help patients with renewals, by reminding the patient about the renewal and then calling the GP on their behalf to deal with the refill. It is reported that patients liked this services. Within the context of ETP, this suggests that efforts to redesign the prescribing process should extend beyond the automation process to include considering the use of relatively low-technology solutions particularly with respect to renewals to more easily enable patient involvement.

It might be sensible, for example, for renewals to be completely handled in-pharmacy, and for dosages to be titrated as appropriate in consultation between patient, pharmacist and doctor.

Table 3: Problems and ETP impact	
Source of problem	Impact of ETP
Patient chooses not to fill prescription	Discussion with doctor on choice of pharmacy may identify this issue, and thus reduce likelihood
Patient forgets to fill/delays filling prescription	Pharmacy may call patient about pick-up or delivery
Pharmacist challenges patient's claimed eligibility for exemption from charges	Eligibility established by GP when issuing e-script, with potential reduction in fraud and source of conflict
Patient changes mind about where	Uncertain:

they want to fill the prescription	<ol style="list-style-type: none"> 1. Will ETP deal with inter-pharmacy transfer of e-scripts? 2. Will pharmacies pre-dispense medicines for pick up, or wait until patient arrives at pharmacy?
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4.4.1 Policy research question

How can the policy priorities focused on developing the role of the pharmacist be developed in harmony with the commercial context in which pharmacies operate, and which engages the commercial sector collaboratively in that development, particularly taking account of the impact policy implementation can have on the health care value chain?

4.5 Patients, doctors and pharmacists: an evolving relationship

From the patient's perspective, their expectations of receiving a prescription are outweighed by doctors' beliefs about patient expectations of receiving a prescription. The crucial factor lies within the realm of the doctors' patterns of communication with the patient, and the nature of the patients' symptoms.

This would suggest that the substitution of an electronic prescription for a paper prescription would offer communication-based opportunities to more carefully discuss the likelihood that the patient will actually take the medicine – since the ETP process in effect causes dispensing within the pharmacy. This is clearly of benefit to all concerned and would potentially impact on the significant cost of prescriptions issued but not filled, or prescriptions filled but not taken, by raising awareness and understanding.

For patients, a first-prescription for a chronic health concern, the issue of early compliance and understanding are particularly important.

It would seem unlikely that the patient leaving the doctor's office without a *paper* prescription will affect the doctor-patient encounter, since patients' prescribing expectations are outweighed by doctors' perceptions of patient need.

Pharmacists and patients have an uncertain relationship which is defined around a dispensing function, not a shared relationship based around medicines and health.

All this suggests that ETP offers an opportunity for professionals to improve their patient relations in a variety of ways, from new forms of service delivery, the provision of more context-sensitive information, and just improved interpersonal communication. The relationships involved are fragmented and in need to greater common cause in respect of a patient focus.

It is worth adding that efforts are underway to improve working between pharmacists and doctors.³⁴

4.5.1 Policy research question

How can policy encourage greater cooperation between prescribers and pharmacists in the context of reducing adverse consequences on patients arising from poor compliance or problems utilizing the benefits of e-prescribing systems?

4.6 Prescribing and older people

Nursing homes need to be singled out for special consideration. There is particular concern that ETP might be able to address what are seen as serious concerns for improving health and outcomes amongst a particularly vulnerable population: older people are more likely to suffer from multiple medical conditions which lead to higher risk of adverse drug reactions, and drug-drug interactions.

The research shows that concerns about prescribing and older people rest on a variety of bases:³⁵

- Residents of nursing homes are more at-risk from inappropriate prescribing than the older population more generally;
- Medicines review by pharmacists are inadequate despite considerable efforts to improve audit and management; the current batch-processing of prescriptions by GPs and pharmacists for nursing home residents may be a factor here;
- Poor interprofessional communication amongst pharmacists and health professionals responsible for the care of older people is widespread and which continues despite efforts to improve through joint audit.

The burden on the UK health system was estimated by Bandolier³⁶:

Calculating from the number of accident and emergency visits and inpatient days, the rates of ADR likely from UK, European and US studies, and average stays, the estimate for the burden on the UK NHS was equivalent to about 15-20 400-bed hospitals. This would consume about 4% of available bed-days.

Recent research has shown the potential beneficial impact of computerised decision-support to reduce inappropriate prescribing, and the importance of the doctor being able to access the complete prescribing history.³⁷ The research highlighted decision-making around when to discontinue medicines as a potential weakness to be corrected in computerised systems.

It should be possible through ETP to address these key factors by ensuring improved vigilance of prescriptions from nursing homes in particular and older people in general. The emphasis should be on how ETP supports better management of polypharmacy

4.6.1 Policy research question

How can e-prescribing influence the redesign of prescribing for vulnerable individuals, particularly older people and those in nursing homes as top priorities?

4.7 Polypharmacy and expansion of the prescribing role

With the expansion of the numbers of prescribers, the risk of uncoordinated polypharmacy becomes a possibility. The ability of ETP to create an integrated and accessible record of all medicines prescribed will be an important consideration.

Special reference should be made regarding dentists who are a major prescriber of antibiotics and analgesics to ensure integration with similar prescribing by others.

Understanding the complex health implications of co-administration of medicines raises many important issues for both patients and prescribers. Co-administration is particularly common in treating hypertension, and heart disease; complex combinations of medicines are particularly common with older patients.

4.7.1 Policy research question

What programme of support is necessary to deal with patients who are often higher cost and higher utilization and are therefore at greater risk from the problems associated with polypharmacy, such as drug combinations, dosage, and medicines review/utilization?

5 Knowledge utilization and ways of working

5.1 Inter-professional communication

Patients suffer when professionals do not communicate, and professionals do not communicate effectively for a variety of reasons. What is evident from research is that communication between doctors and pharmacists may have a major implication on the way that electronic prescribing works and thus affect patients.

Sweden's health professionals have considerable experience with electronic prescribing, but its use is closely linked to the extent to which doctors and pharmacists enjoy good inter-professional working – it is highest where this way of working is best, and lowest in communication blackspots. The hypothesis is that the greater use of electronic prescribing reflected greater confidence of the two health professionals – i.e. prescribing was within a common system of patient care, perhaps. Low use suggests a professional distance between the two health professionals and no essential understanding of the potential common benefits for patients of electronic prescribing.

Patients suffer when professionals not only do not communicate but express different views of treatment (or indeed hold different values as to what successful treatment looks like) within what should be an integrated programme of care. Patients are to a major extent the one factor that does integrate the care pathway, since they are the one common element across it, yet they are the least well-informed and have the least access to information.³⁸ Indeed, this may not be a bad thing, and policy may need to support this.

However, accountability to patients for improved inter-professional communication may be better enabled by ensuring that patients can access the same information on medicines as the members of their health care team – whether or not those members are actually working together. This naturally has implications for ensuring integration between the different prescribers, including public and private prescriptions, since the merits of the system are to ensure that *all* prescribing is captured regardless of source both to provide the necessary comprehensiveness, and to avoid unintended consequences of policy-induced service gaps. As well, patients, with rising expectations of their care, are unlikely to tolerate gaps in their primary care providers' knowledge of the medicines they are taking.

ETP is likely to have an impact on the forms of communication between GPs and pharmacists. In many cases pharmacies use the pick up of prescriptions from GPs' premises to clarify any questions that they have about the prescription.³⁹ This may result in a reduction to the number of calls between pharmacists and doctors to clarify the prescription, and hence fewer opportunities for potential communication and collaboration.

But one should expect new forms of collaboration around high-demand patients, and those who are heavily prescribed.

There is also the need to integrate prescribing decisions of different prescribers.

ETP will certainly need to accommodate prescribing by dentists, particularly with respect to antibiotic prescribing⁴⁰. This prescribing information is not available to GPs unless provided by the patient (who may not volunteer this information).

5.1.1 Policy research question

Is it desirable that a national system of ETP integrate all medicines that patients are prescribed or choose to take (over the counter and pharmacy only, from any prescriber, whether a doctor or dentist, or public or private) or should it only deal with NHS prescriptions?

5.2 Skill-mix

The tasks of the pharmacy tend to keep the most valuable member of the team largely remote from the patient, focused on the supervision of dispensing. To move the pharmacist 'in front of the counter' has implications for the reimbursement of pharmacies for non-dispensing activities.

Not addressed in the ETP evaluations is whether an implication of ETP will have an impact on the labour market demand for pharmacists. The Swedish research has shown a saving of 30 seconds per line item dispensed by pharmacists⁴¹ which suggest a small freeing up of time. Certainly, evidence from other industrial sectors has shown that skill-mix redesign is linked to the development of automated systems, particularly those that are customer-facing.

Banking is a notable example, where skill-mix redesign in response to the widespread use of the internet has tended to split contact with the bank through telephone call centres or internet, and in-bank services offered by the teller to be diversified with enhanced decision-making. Most obviously, low value activities in banking have been automated, while key value-adding activities have seen increased levels of knowledge required. And banks now embrace a very wide product range and in particular have pursued activities which have increased the skill-mix presented to the customer.⁴²

It is not unreasonable to assume that traditional front-line staff in pharmacy will need to move toward greater knowledge of the medicines in order to provide higher-value service to customers, such as customer identity verification, ensuring understanding of the medicines that are prescribed, and enrolment of the customer in a care management programme. This presents a not-inconsiderable opportunity for pharmacies and pharmacists.

5.2.1 Policy research question

Are current legal and other guidance on professional responsibilities compatible with greater flexibility in skill mix in pharmacy?

5.3 Comparative quality and performance indicators

Deloitte and Touche, in their study on the emergence of the e-health consumer⁴³, report that rising sophistication in consumers is linked to access to greater comparative and

performance information about health providers. The benefits of performance information are generally focused on the reduction of variance in service quality. The public benefit, though, lies in the support provided to individuals to be more discriminating in their assessment of the quality of health care as received. As this becomes more widely available in the UK, is it reasonable to assume that, like their US counterparts, British consumers will, too, become more discriminating?

Early signs are evident, beginning with the provision of consumer-friendly versions of scientific and medical information. Dr Foster, an e-health information provider, offers a wide range of data, including NHS performance data.⁴⁴

It is not unreasonable to assume that prescribing data, too, will be of interest to patients. Many e-health companies provide selected information on different medicines, risk tolerance, side effects and other information, though within the EU and the UK, there is concern about potential breaching of the EU's Advertising Directive with respect to the specificity of medicines information.

The ETP datastream offers opportunities to improve reporting to patients about co-administration of medicines, based on best practice guidance, adverse effects of medicines combining and drug-drug interaction. It may also be possible to provide information on an individual prescriber's prescribing patterns, as part of performance and quality reporting. Patients, too, may become interested in whether their prescriber is fully informed about new medicines. This is likely to be more relevant to patients as they encounter new types of prescribers.

Obviously, effective electronic prescribing will integrate with clinical decision-support systems and provide data for the individual's electronic health record, which increasingly will be accessible to patients. It will become difficult to separate the specifics of prescribing choices by prescribers from information provided to patients about medicines.

5.3.1 Policy research question

Are current restrictions on providing information on prescription medicines to patients appropriate given the priority on increasing public understanding of health, and enabling greater patient choice?

5.4 Prescribing and dispensing

5.4.1 Dispensing doctors

Doctors who prescribe and dispense are permitted, but there are concerns that dispensing doctors are less rigorous in their medicines management. It has been noted that dispensing doctors spent more than half as much again on medicines for their patients as did prescribing general medical practitioners in 1997-98.⁴⁵

The possibility of ETP reforming this role may rest on the extent to which ETP enables supply chain developments such as mail-order and home delivery. The yardstick for dispensing eligibility – a pharmacy more than one mile away – may be largely meaningless

with electronic prescribing. The evident benefits from this may lie in the prospect of being prescribed a different medicines regime.

5.4.2 Repeat prescribing

ETP offers the not-inconsiderable opportunity to reform the whole repeat prescribing system. The main social issues to consider are:

- reminding patients to request a refill: a pro-active rather than passive approach,
- choosing the form of refill: largely administrative issues of dispensing such as 7-day refills and 28-day packs,
- requesting a repeat prescription: email, telephone, fax, other, and the responsiveness of prescribers to these various forms.

5.4.3 Reminders

The current situation in the UK is that there is no formalized system to remind patients to renew their prescriptions, or indeed to take their medicines in the first place.

In the ETP pilots, Pharmacy2U offered a telephone reminder service to patients to prompt them to renew their prescription. It was reported in the ETP evaluation studies that patients responded positively to this.

The ETP evaluation studies also reported that patients often sought to renew prescriptions by telephone and in general were discouraged from this practice (except in cases of patients for whom such a service was deemed appropriate – housebound, or terminally ill). However, the in-practice management of repeat prescribing is mainly administrative.

Reminder services are an integral feature of almost all integrated care and disease management programmes which offer via direct contact by a call-centre nurse, by SMS text messaging, or automated reminders such as emails. The largest implementation of such programmes is in the United States, but comparable programmes are available in Germany – where disease management programmes are reimbursed, Netherlands, Italy, and increasingly in Nordic countries reflecting their advanced implementation of telehealth.

Integration of the ETP datastream with a disease management programme offers the opportunity to introduce pro-active reminders to patients.

5.4.4 Policy research questions

What is the function of dispensing doctors in an e-prescribing system?

How can a more effective system be enabled which helps patients deal with repeat prescribing, and in particular is the existing system appropriate to an e-prescription environment?

How can e-prescribing enable a more effective system of reminding patients about their medicines?

5.5 Implementation of a system for electronic prescribing

Can the method of implementation of electronic prescribing be considered a factor in social impact?

Sweden adopted the approach that GP systems developers would ensure integration within Apoteket's own system, and which works with the various suppliers to ensure transmission of a proper electronic prescription. The overall voluntary, opt-in approach has meant that varying degrees of utilisation have been realised. The County Councils have learned, however, that it is important to ensure good levels of communication between doctors and pharmacists and that this may indeed be a key factor to its effective utilisation.⁴⁶ The system currently manages about 400,000 prescriptions per month, or 19% of total prescriptions after 3 years of implementation. They are positioning electronic prescribing as a driver for subsequent introduction and adoption of the electronic patient record.

Denmark adopted in 1995/6 a national system of standards, MedCom (now a company), which suppliers of health IT systems adopt; it is an internet-based, cooperative venture between the private sector, and health authorities which works to open systems standards. Doctors opt-in on a voluntary basis. The system currently processes about 70% of all prescriptions electronically – about 900,000 per month. The approach taken is focused on a generalised communications infrastructure into which various capabilities can be embedded, such as prescribing, email, referrals, discharge summaries, pathology requests, etc.⁴⁷ This approach may have important learning on how to deal with professional resistance to the implementation of new health technologies by integrating functionality within a system of common standards, in this case for communication and transfer of information. Prescribing data is automatically integrated into the patient electronic health record.

United States developments include the first state-wide implementation of electronic prescribing in Rhode Island, through a voluntary, opt-in system involving a partnership of public and private stakeholders.⁴⁸ E-prescribing is available in 47 US states in various degrees of implementation. Implementation is driven by the priority to reduce medical errors which it is suggested will be reduced by 55% through the use of automated drug order-entry systems.⁴⁹

5.5.1 Policy research question

Is there learning from other national jurisdictions on implementation of ETP systems to inform the successful development in England?

6 Personal power and control

Patients adopt a variety of behaviours when interacting with doctors which partly determine the nature of the doctor-patient relationship. A common behaviour is the ‘sick-role’, which encourages patient to participate in a doctor-patient relationship which emphasises dependency, and casts the doctor as the agent of decision-making for the patient.⁵⁰

Electronic prescribing may require the patient to move away from adopting the agency relationship since the disposition of the prescription is now a patient’s decision. This may be significant since it cannot be avoided for practical reasons. In this respect, patients may find themselves with an element of power and decision-making that hitherto they have not had, and be unaware of the longer-term implications of exercising this judgement if it does, as this study suggests, open up a wider discussion about patient choice, compliance and concordance.

6.1 Choice

This study has emphasised the potential impact on the doctor-patient relationship of ETP. The ability of ETP to support individual patient’s choice of pharmacy is a core implementation feature of ETP, and is consistent with policy priorities.

However, as has been often painfully experienced in other countries, efforts to increase the management of patient care through cost controls, cost containment strategies, and disease management programmes have often been at the expense of choice. Offering a patient choice entails that patients have a free choice from a range of options; choice of pharmacy is a simple one. However, if the prescribing datastream is used to enable integrated care programmes, it may be necessary to limit patient choice to a single pharmacy for fulfilment if that pharmacy is the one offering the programme that the patient is enrolled in. This may be appropriate if the individual pharmacist and the patient are to have a specific relationship. It remains to be determined whether this is significant.

Additionally, the potential changes in the doctor-patient relationship associated with the progressive lessening of the agency role of the doctor would be consistent with the view that telehealth more generally necessitates a shift away from self care and health management supervised by the GP, to forms of greater personal empowerment and self-management of care.

It may even be possible for patients to prescribe their own medicines through intelligent support systems or manage their own repeat prescribing.

6.1.1 Policy research question

Should 3rd party chronic disease management programmes (or similar) be encouraged as a component of the further development of e-prescribing?

6.2 Consent

The applicability of consent to the use of information captured by the ETP system raises a variety of legal issues which need to be considered further.

6.3 Potential legal issues

This study is not designed to focus on either technical or legal issues where specific competencies are required. However, discussions and research have suggested that there may be relevant legal issues which link to social implications and the patient.

The Swedish interviews raised specific issues, relevant to their jurisdiction and situation but which may need to be determined in the UK.

Sweden is proceeding with e-prescribing ahead of implementation of an electronic health record. It appears to be the case that under their data protection laws prescribing data held by the pharmacy cannot be communicated back to the prescribing doctor, nor can the pharmacy hold individual historical records of medications.

It appears further that there is an issue of contention regarding under what circumstances the patient's consent is required. This is based on determining the organisational boundary for the data protection of the information in the electronic health record. One view is that all providers, including pharmacies, are with a 'single system' and therefore movement of information does not require further patient consent. This contrasts with the view that different data controllers equates with different data protection responsibilities and thus a need to secure consent when data jurisdiction changes. The range of issues includes:

- Data protection, historical record of data in pharmacy
- Patient consent to the data being collected
- Link to health record and who has access
- Consent to release data and who owns the data
- The storage and access to prescribing data and who stores it and who is authorised and how

The view is that these issues are having an impact on how to introduce integrated models of care which are anchored in primary care and depend on access to the repeat prescribing part of the electronic prescribing dataset. Resolving the issue in favour of patient consent is consistent with a view that individuals are responsible for their health, but this may raise administrative and policy issues to be further considered.

7 Boundaries between groups and organisations

The reshaping of boundaries between groups and organisations is fundamentally influenced by the creation of a real-time datastream. Boundaries can be physical, but from the perspective of change from information technology, boundaries define jurisdictions, authority, ownership and control. Organisations are created in the first place because they are a cost-effective way to organise people given the resources that are available. They become complex, costly and cumbersome when the costs associated with them exceed the benefits they bestow or services they offer. Information technology breaches these organisational boundaries and creates the conditions for new forms of organisational design or arrangement of resources. The challenge, though, is to know that this is happening. The evolution of organisational form in response to changing environmental and social conditions is a feature of social change. Innovation itself is often reflected in this reshaping of boundaries and the testing, often unsuccessful, of new organisational forms.

These changes have been slower coming in the arena of public and government services, and particularly difficult in health service delivery.⁵¹

More generally, these changes reveal themselves in the restructuring of the supply chain, or the network of linkages between suppliers and customers, which in turn has considerable impact on the user's experience of services.

7.1 Could ETP trigger market restructuring?

While the OFT report highlighted the market structure in light of current constraints and regulation, the introduction of ETP may lead to more generalised market restructuring with potential impact on patients, but which can only be surmised at this stage.

In the City University study of banking and finance⁵², they identified a variety of factors which reflected the changing competitive nature of this industry, and the response of industry to them. The pharmacy industry may be seen as relatively stable, given the reliability of NHS prescribing business. Since an individual pharmacy derives considerable income from NHS prescriptions, and no one pharmacy chain appears to occupy a dominant position, under present market conditions there appear to be no incentives for pharmacies to improve service. ETP may introduce an element of pressure into the market that may precipitate a review of the determinants of competitive success within the health care value chain. This could focus on service improvement and innovation, supply chain redesign and competitive response through brand differentiation.

From the patient's perspective, this could have any or all of the following consequences:

- Greater efforts by community pharmacies and pharmacy chains to seek out and retain prescribing business, for example, to maximise the opportunities to capture a greater share of an individual patient's repeat prescriptions by offering disease management, integrated care or patient experience programmes;

- Potential consolidation as the benefits of specific locations cease to be as valuable as in a paper-based system;
- Implications for the role of pharmacists' careers and role within community pharmacy in particular with a shift from an "expert/telling" role toward a "consulting/partner" role as pharmacies seek to improve their relationship with patients;
- Focus on increased in-pharmacy sales to maximize what is likely to be a much shortened stay in the pharmacy while patients pick up their medicines;
- Increased development of new products and services by pharmacies, and perhaps pressure from pharmacies for regulatory change to permit more user-pay/co-pay health services, or greater services offered for reimbursement by PCTs;
- More focus on brand awareness within the public generally around choices of dispensing pharmacy.

7.2 Impact on markets

ETP is likely to alter the structure of the market in respect of the following areas with a corresponding social impact:

- Data collection
- New and existing market entrants
- Substitute products
- Bargaining power of buyers and suppliers
- E-health, e-government

The key question here is determining how the market and policy-makers will respond to ETP. These areas are likely to have an impact on individuals, either collectively and diffusely so that general features are changed, or specifically and individually, so that specific groups notice a difference.

For policy-makers these implications are particularly important to ensure an appreciation of the intended and unintended consequences of ETP implementation, particularly if it creates new forms of social exclusion, resolves others or alters fundamental relationships which affect the dynamics of regulated markets – in effect, do the rules change.

7.2.1 Data collection

Creation of a real-time point-of-use datastream means greater data and thereby greater opportunities for analysis. This data is of particular interest to pharmaceutical companies which seek information to support marketing in a competitive environment. In the US, electronic prescribing systems are popular and have been controversially provided free to doctors in return for access to the datastream. This raises important issues for regulations,

which should be reviewed in this light. Recall the importance of what has been called ‘internet exceptionalism’ and the risk of framing regulations to deal with technology rather than function and use. In this case, the issue is the creation of the real-time datastream and its potential interest to others, not whether it is accessed via any particular technology.

The implications for patients, though, may be more beneficial. Real-time data takes health systems closer to “real-time health care”, where the gap between a clinically relevant event happening to the patient and that event becoming known to a care provider can be reduced. Central to disease management programmes is a steady flow of data, whether monitored or reported, about the patient’s health state. The opportunity exists to rethink third-party access to prescribing data if it is associated with an integrated care programme.

An obvious example would focus on compliance and concordance with the prescribed regime, but also adverse and drug-drug reactions. The design of such a programme, linked to named medicines, raises important issues for health professionals and creates potential new sources of influence on the prescribing decision. However, from the patient’s perspective, such programmes do offer demonstrable benefits.⁵³

7.2.2 New and existing providers

New providers come into existence and new opportunities are available for existing providers.

7.2.2.1 Care management programme providers

Linked to the issues of data collection, commercial opportunities can be created focused on the development of integrated care programmes, and patient experience programmes. Integrated care programmes focus on (usually) chronic health and ensure that patients are widely managed within a care programme. Patient experience programmes focus on specific aspects of medicines where patient compliance with the prescribed medicine is important; such programmes focus on the patient outcomes as perceived by the patient – perception of adverse reactions, problems of co-administered medicines as well as surveys and telephone support to enhance compliance.

Additional services have been put forward in ASDA’s submission to the Health Committee⁵⁴ on expanding the scope of pharmacy services:

Other services that could reasonably be linked to payment to encourage the pharmacy market to lift service standards include: the provision of emergency services, extended opening hours, repeat dispensing, supplementary prescribing, [additional examples deleted]. It may be that some of these services would be valued more highly than others and remunerated accordingly.

To this, we would add disease management programmes, patient experience programmes, and pharmacy integration with models of integrated care, and care pathways.

This appears to be compatible with Department of Health policy on the potential use of HRGs:

The development programme for service classification tools over the next two years will see the tariff refined and extended to provide tools for commissioning packages of care, encompassing diagnostics, outpatient care, and community health services, as well as hospital services.⁵⁵

By extension, then, third-party suppliers to the health service could emerge to provide aggregated benefits to groups of patients. It is obvious that pharmacists and their associated pharmacies are likely suppliers of these programmes (perhaps contracted from specialist programme developers).

It would need to be determined whether patients would enrol in such a programme if there was a co-payment involved; though this could be offset through the use of supplementary insurance as is the norm in other countries. Whether there was a cash (uninsured) market would need to be determined, particularly if the programme lacked the support of the patient's primary care provider.

The emergence and potential use of such programme providers would have an impact on patient choice. This has been observed in the United States under managed care. For providers to manage their programme costs, they restrict patient choice to services offered within the patient's Health Maintenance Organisation. As the NHS explores patient choice and access, it may be necessary to limit choice in order to derive the benefits of disease management programmes.

For example, a care management programme offered by a pharmacist, anchored in the local pharmacy, might only work if the patient had all their prescribed repeats filled at the same pharmacy. However, if it was not felt important to maintain a patient relationship with a unique pharmacist, then it would be necessary to ensure integration of care and relevant data capture across all pharmacies of potential choice by patients. This would, though, defeat the opportunity for pharmacists to engage directly with patients on the delivery of new programmes.

7.2.2.2 Stock and inventory management

A small number of prescriptions are not filled at present owing to their being unavailable in the pharmacy at the time the prescription is presented. The ETP evaluation reported that perhaps 15% of patients experienced stock problems when they presented their prescription affecting either the whole or part of the items required. The opportunity to ensure proper fulfilment in-pharmacy through improved stock control is likely given the advance notice ETP offers on the dispensing side.

To accommodate this, improved "almost-on-demand" delivery to pharmacies by wholesalers for inventory control may be contemplated, so the pharmacy may actually need to hold less stock of less frequently dispensed items "just in case". From a competitive perspective, a move to an on-demand type wholesale fulfilment market will offer additional economic benefits that may need to be better understood in order to ensure appropriate regulation; failure to fill the prescription is an example of service failure from a commercial perspective.⁵⁶ From the patient's perspective, they should, of course, encounter virtually no delay in receiving their medicines, and certainly no need to return to the pharmacy.

The pooling of prescriptions electronically for draw down by pharmacies is a feature that Sweden is considering, so the patient would not even need to discuss this with the doctor at all; the doctor would send the prescription to the pool, and when the patient presents at the pharmacy, the pharmacist would then retrieve the prescription and fulfil it. This offers benefits to patients by eliminating even this discussion from the doctor-patient encounter – with its own potential consequences as discussed. But it also means the potential to forego the benefits that supply chain redesign might bring.

7.2.2.3 Automated dispensing

The use of robots in dispensing is just beginning. It is worth noting, though, that Wells Close Square pharmacy, Berwick-upon-Tweed, has installed robot dispensing, as had the pharmacy at RAF Lakenhealth, which installed robot dispensing in 2000 and reports that there is 99.9% dispensing accuracy.⁵⁷

It is conceivable that robotic dispensing could interface with the ETP datastream to automatically dispense medicines in a dispensing warehouse, for delivery to the patient pick-up point.

7.2.2.4 Online pharmacy

ETP enhances the likelihood that data integration will create the conditions for online pharmacies to be developed. These arise in the nexus of the datastream, reformed fulfillment models particularly repeat dispensing, redesign of the health care value chain, and importantly, the engagement of the patient in care programmes. Associated regulatory responses will be needed, and important lessons can be learned from the United States which implemented an accreditation system to address the emergence of online pharmacies.⁵⁸

7.2.3 Substitution

Will patients see pharmacies as essentially interchangeable more than they do now, when ETP is operational? Pharmacies may seek to differentiate themselves to benefit from potential aggregation opportunities by pooling prescriptions and offer more linked in-pharmacy services. This is the essential opportunity disease management programmes offer and which emphasise the role of the pharmacist in patient care.

Alternatively, the dispensing function could become so disaggregated that patients might be able to pick up medicines in many more places, and thus put additional pressure on the regulation of the dispensing function. This might extend to pick-up kiosks in public areas, greater attention to home delivery, and possible co-location with other sorts of local businesses such as post-offices, particularly in rural areas where pressure on post-offices is acute.⁵⁹ Similarly, the service whereby pharmacies pick up prescriptions from general practices is unlikely to be needed in an electronic prescribing system. Pharmacies may either choose to divert this resource into expanding home delivery, or into other patient-focused services, or elsewhere within the pharmacy.

All these put pressure on existing systems of regulation, but are conceivable in an environment which is valuing greater patient involvement, but challenge current models of economic viability by altering the conditions for business success.

Considerations here have an impact in cross-border transactions where differing fee structures apply (e.g. England/Scotland) or where jurisdictional issues are still being worked out on the portability of benefits (EU cross-border health services).

The options available to pharmacies are dictated by a combination of commercial management and patient service priorities, which can be influenced by potential expansion of the pharmacy/pharmacist role. However, for patients it is conceivable that an enhanced fulfilment experience will emerge to their benefit.

7.2.4 Bargaining power

The datastream may redress informational asymmetries which affect health care and underpin the relative power relationships, particularly the doctor-patient relationship.

Greater information creates the opportunities for markets to operate more efficiently if that information can be shared in a fair and timely manner. This is a complex area in which considerable regulation on access to information governed by patient consent. It is also an area which needs further consideration given the evidence that poor flow of information contributes to problems with service delivery across the whole health care value chain.

For instance, greater information for buyers of medicines, such as doctors (who buy through prescriptions) can influence their prescribing choices and influence products in clinical formularies. Restricted formularies may encourage suppliers to offer to support those specific products more completely in return for greater assurance of market share. This is often a key factor involved in industry-sponsored disease management or patient experience programmes – if a particular product is on a formulary and is going to be the product of choice, then suppliers could argue they should be enabled to provide better product support (including information to patients). This, of course, has the effect of increasing the switching costs for doctors, who may want to use a different medicine but find patients enrolled in a particular proprietary care programme.

There may be comparable issues within the supply chain which needs further consideration.

With respect to suppliers, ETP creates the opportunity to respond to larger groups of patients with support that is linked to their more general features, such as all diabetics, all COPD, etc. This, too, is anchored in the datastream and in need of further consideration.

7.2.5 E-health, e-government

Policy-making in the data-rich information age involves taking account of the role of the state in setting up conditions which may or may not impact the health care value chain and the patient's journey.

Policies such as ETP raise important issues about the management of relationships between patients, doctors, pharmacies, and thereby suppliers and other social actors within this context. ETP is not just about prescribing, but is about health in the 21st century.

This study, itself, is seen as providing a basis for policy-makers to assess the role of the state in e-health and e-government by laying out the social implications across a wide range of areas.

7.2.6 Policy research question

What should be the impact of health policy development and implementation, and health systems regulation, in the ETP context, on the structure and operation of the health care value chain?

7.3 Implications for the findings of the OFT report on deregulation and community pharmacy

The OFT research and subsequent report⁶⁰ focused on economic and economically determined welfare considerations in the deregulation of NHS dispensing contracts in community pharmacy.

The Health Committee convened a rapid enquiry to assess the OFT's conclusions and took written and oral evidence.⁶¹ The Health Committee concluded that undesirable social impact was likely through pharmacy closures under deregulation and subsequent impact on vulnerable groups and their access to pharmacy services. The OFT concluded that substantial and socially unacceptable closures were unlikely.

Without critiquing the OFT's and Health Committee's views in detail, the key observation is that the reports and associated assessments did not take account of ETP as a potential impact. The essence of the OFT work drew conclusions based on the current spatial distribution of pharmacies in relation to people and GP practices. Their work noted that the average distance between a pharmacy and a GP practice in England is 0.47 km and that 60% of pharmacies are within 0.5 km of a GP practice.⁶² From the patient's perspective, this offers considerable convenience, especially since there are about 1.5 community pharmacies per GP practice, and the likelihood is that it will be within a 15 minute drive time for the patient.⁶³

However, taking ETP into account substantially alters the structure of pharmacy services assumed by the OFT's work and the Health Committee's conclusions.

A fully functioning electronic prescribing system decouples the argument based on the location of the pharmacy and geographic proximity to a GP, and connects it to the pharmacy in the context of patient choice. The GP after all will ask the patient where they want the electronic prescription sent, not determine it, whether or not a GP practice has a co-located pharmacy.

The deciding factors are, therefore:

- The patient's use of time: when is the most convenient time to pick up the medicine

- The patient's geographic preferences: where is the most convenient place – near home, near work, near shopping, etc.

Since the patient no longer needs to be concerned with the technical aspects of the prescription, or the various mechanisms of fulfilment, their preferences as to time and place become the determining factor. That a pharmacy is near or far from the GP premises or their geographic distribution may be meaningless in the final analysis.

It is, therefore, reasonable to assume that the OFT's conclusions may not hold under an ETP regime. If the co-location of pharmacies and GPs is not necessary, then the leapfrogging argument where practices move closer to GPs makes little sense. Similarly, the benefits of pharmacies grouping in particular locations, such as shopping centres, makes greater sense, since the logic of location would say that pharmacies would locate where people congregate. In this respect, the efforts to influence patient's decisions of choice of pharmacy through near or co-location with doctors would be replaced by a patient-focused orientation based on the wider context of patients' expectations of convenience and use of time. This may have less impact on vulnerable groups since enhanced forms of fulfilment are likely to emerge as a cost-effective response to changes in market structure.

It is outside the remit of this study to critique the OFT's findings in detail, only to cast this level of doubt based on an assessment of potential social impact. It would, though, be appropriate to remodel their assumptions based on patient-centred assumptions arising from ETP.

7.3.1 Policy research question

Are the OFT's conclusions on community pharmacy altered when a fully functional e-prescribing system is taken into account?

8 Perceptions of change, geography and distance.

It is fundamental to how people lead their lives that they should have considerable control over time and place. We speak of freedom of movement, choice and personal autonomy as key features of civil society. What we mean is that people can move about without undue restrictions, and can choose the manner by which they lead their lives. Indeed, personal autonomy is a prized feature of the modern workplace, often defined as the ability to determine working hours.

It is a lack of relevant freedoms which is often associated with notions of social exclusion. The evolution of the information age, though, is redefining our notions of social exclusion to take account of factors associated with access to technology, or ability to participate in the knowledge society. The root cause of this is the impact the real-time datastream has on the organisation and delivery of services, the health care value chain and the consequential reshaping of the patient's experience of care.

8.1 Nature of change and social exclusion in the information age

It is often the case that the assessment of change in the structure of markets is based on a view of social exclusion based on industrial age concepts, such as geographic distance and drive time, as in the OFT report.

However, in a social assessment of ETP, a different model is needed to understand the context of potential social exclusion and which would reflect an emerging social paradigm within the information society. This paradigm has been expressed in the e-Europe 2005 commitment of the European Commission:

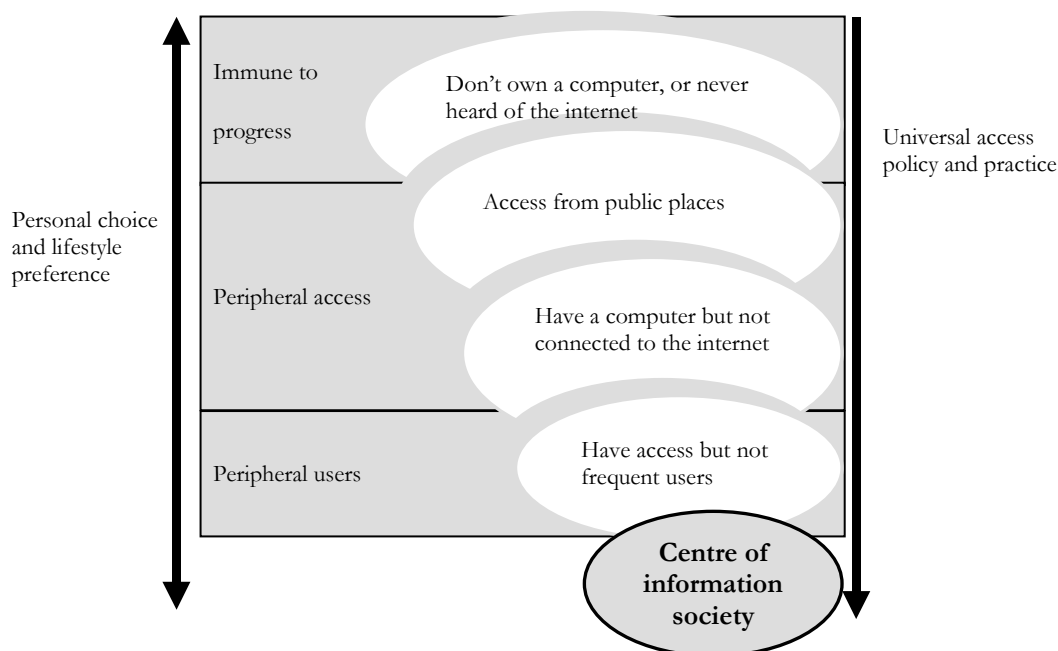
New services, applications and content will create new markets and provide the means to increase productivity and hence growth and employment throughout the economy. They will also provide citizens with more convenient access to information and communication tools.⁶⁴

And along with these new tools and services will be the need to rethink what we mean by social exclusion. Often this is synonymous with the term 'digital divide'. But the digital divide seems more to be about the transitional feature involving those who do or do not have access to or can afford the appropriate technology, and less about the social features of transforming society. Progress, though, has been made in developing universal access policies for the information society with programmes such as eEurope 2005. We will need different notions of social exclusion for the information age.

Wilhelm⁶⁵ has considered the issue in the context of democratic society and formulated a different notion of exclusion based on the extent to which individuals are, through choice or otherwise, at the centre or not of the capabilities of the information society. In this model, the extremity, those who would be most excluded, are viewed as lacking access to technology – they choose not to have it. With a universal access policy, and widespread access to broadband connectivity as a social right, this notion fits more the direction of travel in societal transformation. The diagram recasts Wilhelm's original position by emphasising that policy priorities would be focused on universal access to address

peripheral and marginal groups to move them closer to the centre of information society, but that location on this spectrum largely reflects personal and lifestyle choices, more than being pure social exclusion.

Diagram 5: model of social exclusion in the information age (after Wilhelm, 2000)



Change, too, is linked to notions of time. And in understanding time, we need to take into account that the change is really a norm of the modern world:

The world will continue to change.

The pace of change is faster than our ability to respond to it.

The pace of change as perceived will not relent.

The gyrations we have come to understand as change reflect in many cases the emerging implications of wholesale changes wrought by new technologies (but that is not really something new), and suggest that the implications of ETP may need to be seen in the context of continuing change, and not stability. Policy makers will need to understand the dynamics of change in the context, and adopt the view that policy cannot control change, but may trigger it, retard it, or distort it.⁶⁶

Some aspects of ETP will simply be transitional, others temporary others a step change and others will be permanent:

- Not all patients enjoy ETP equally regardless of how widely diffused it becomes because variations will still exist at the interpersonal level;
- Pharmacies will gradually adopt ETP, so not everyone will have for some time to come;

- Pharmacies will respond in different ways to ETP, ensuring that the pharmacy experience of patients is likely to vary, as it does now;
- ETP has the potential to alter many of the assumptions underlying the relationships within the health care value chain which could alter the structure of the market, itself.

What does not change, though, is that ETP permits patients to fill prescriptions at a time of their choosing, knowing that all elements of a safe and correct fulfilment are in place.

8.1.1 Policy research question

How is exclusion to be understood in the information society, and in what way should such understanding support policy priorities toward medicines management and ETP?

8.2 Death of distance

The death of distance refers broadly to the fact that distance for information and communications is largely meaningless when signals can travel apparently instantly around the world. The distance between two people may be measured in terms of geography, and people are familiar with the emergence of standard time to replace 'local time' as a response to the introduction of the railroad. Information creates the same sort of influence.

This means that the spatial relationships between GPs, pharmacists and patients are not merely geographic concepts. Distance for an electronic prescription means nothing as the patient has no interest in how it gets to their pharmacy of choice. And indeed, the pharmacy of choice may not be an issue of geography, but of convenience. Geography only really matters to people when it presents insurmountable obstacles. This may be less an issue as new forms of fulfilment are created in response to ETP.

8.2.1 Location independence

A key feature of new communication technologies, particularly the wider telehealth technologies, is the emergence of location independence. This is a component of the break with industrial age notions of space and geography, and in this case refers to the manner in which services are delivered to people.

Increasingly, we speak of "24/7", "always on", and these terms describe new forms of mobility and access for people when they are coupled with "everywhere". Geography and the accidents of location no longer need be a source of exclusion. Location independence is, therefore, enabled by the design of information-rich systems: accessible from anywhere at any time. This frees the patient from thinking of a particular pharmacy to thinking about any pharmacy, and at a time of their choosing.

What we have is the decoupling of "this pharmacy" from "this prescription". This may lead patients to anticipate other decouplings: of "this doctor" from "this prescription" (patients may see prescriptions in a wider context of other prescribers, which would support plans for this), and of "this patient" from "this doctor" (patients may seek greater choice of primary care provider).

Diagrammatically, this suggests a move from a relatively linear system anchored around the prescription as a sort of ‘glue’ linking patient to prescriber, and patient to pharmacy, to a networked approach, which is consistent with location independence.

Diagram 6: linear system of patient/prescription fulfilment

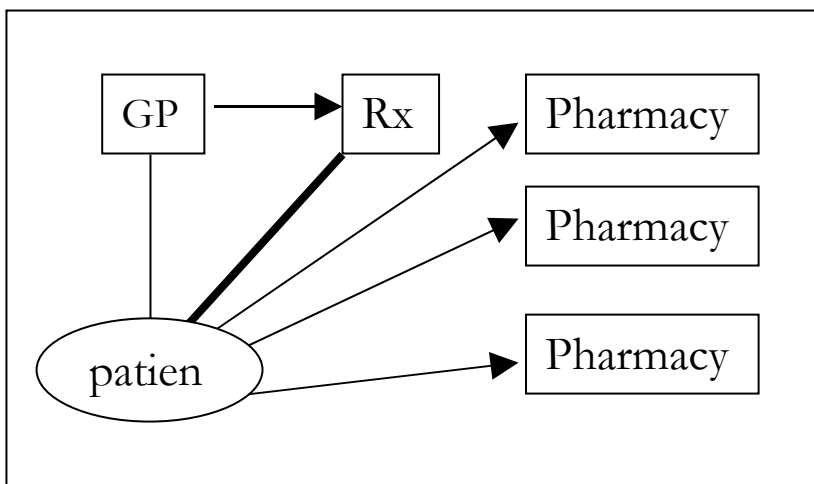
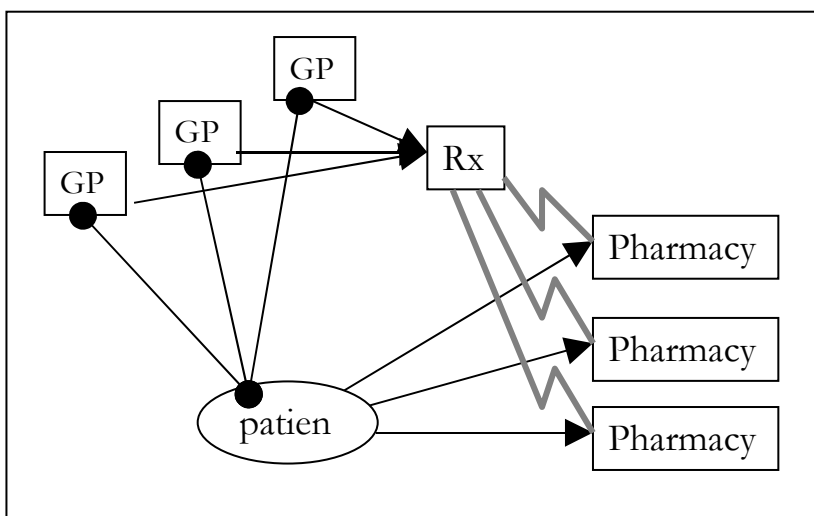


Diagram 7: fully networked system of patient/prescription fulfilment



In the end, a new form of patient choice and decision-making is enabled.

8.2.2 Policy research question

How can policy-makers anticipate the likely impact on society and patients of further development of e-prescribing, into the future, in a way which ensures that policy remains relevant and appropriate to the changing fabric of society?

9 Glossary of terms used

datastream: a continuous, uninterrupted flow of information (across or within a supply or value chain)

disease management: a system of coordinated healthcare interventions and communications for populations with conditions in which patient self-care efforts are significant (Disease Management Association of America www.dmaa.org/definition.html)

electronic prescription: digital prescription

e-script: digital prescription, short-hand term

electronic prescribing: system of preparing electronic prescriptions and sending them between prescribers and dispensers using digital communications technologies

electronic transmission of prescriptions: the process of sending electronic prescriptions

e-prescribing: short-hand term for the system of preparing electronic prescriptions and sending them between prescribers and dispensers

ETP: electronic transmission of prescriptions; a specific term for the wider notion of e-prescribing

doctor-patient relationship: the constellation of personal, professional, and psychological factors involved in the clinically structured relationship between a doctor and an individual patient

integrated care: the working together of all people involved in a person's care, regardless of their role, in a partnership where each person is fully aware of the roles and responsibilities of the other people involved

patient experience programme: a collaborative programme linked to a specific health condition or treatment/medication which is based on patient reported information to guide the programme in collaboration with health professionals

supply chain: the structure of a physical distribution system in a market

value chain: linkages and interdependencies between and among suppliers, buyers, intermediaries and end-users and which identifies how each component contributes (or not) to the creation of added value products or services

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