THE BENEFITS IN AND BARRIERS TO THE IMPLEMENTATION OF THE ELECTRONIC TRANSFER OF PRESCRIPTIONS WITHIN THE UNITED KINGDOM NATIONAL HEALTH SERVICE

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ABSTRACT

This paper contains the results of a study into the benefits and barriers in implementing a system for the Electronic Transmission of Prescriptions (ETP) in the UK National Health Service (NHS). The study involved a review and critical appraisal of most of the available literature on the topic, as well as field research by the authors, and by colleagues at a neighbouring university. The authors have found there to be nine significant benefits that stakeholders should realise from the implementation of a successful ETP system. On the reverse side there are nine important barriers towards the successful implementation of ETP that need to be overcome. Dissemination of these results should provide a useful stepping stone to the successful implementation of ETP in the UK NHS.

INTRODUCTION

In September 2000 an Engineering and Physical Sciences Research Council (EPSRC) funded research project into the development of a secure electronic transfer of prescriptions (ETP) system commenced. One of the first tasks of the project was to look at present system operation and determine where the failures are within the system and how they could be improved with the introduction of an ETP system. Like many paper based conversion projects in the past there were many risks involved in providing a system that would be accepted by the stakeholders, that would achieve all the expected benefits, and that would ameliorate the existing problems without introducing new ones. Therefore one of the initial steps was to gain a complete appreciation of the expected benefits in and barriers to project success. Without an idea of what the benefits and issues were it would be difficult to assess project achievements.

The UK Government as part of their national plan of reform for the NHS has scheduled the introduction of ETP for 2004. It is important that they along with the multiple stakeholders involved within the system know what to expect from such a system, to allow them to make an informed decision on which ETP model to implement. The deadline for ETP introduction is now fast approaching and this paper, along with a second on stakeholders views towards the different ETP models, [4] should be valuable reading for stakeholders looking towards the introduction of ETP.

For the past eight to ten years various papers [8-20,22-28,30-35,37,42,46,47] have been written in academic and public literature on the effects of introducing ETP but no one paper has provided a complete list of all the benefits and issues. In this paper the authors detail the results of their study into these positive and negative factors. This study involved:

?? Assembling the ideas from previous literature in the field into a definitive list.
?? Critically appraising this in the light of the authors own research and practical fieldwork with different ETP stakeholders, and
?? Including the results of a related socio-technical study carried out by colleagues from Huddersfield University [46][47]

PAPER BASED PRESCRIBING

To explain the present prescribing system in the UK NHS it is best to describe a general case scenario of a patient requiring unrestricted drugs (e.g. not drugs like Methadone for which there are UK controls on prescribing) on a visit to their family doctor. After assessment of the medicinal requirements of the patient the doctor writes or prints off a prescription on a special prescription form. The doctor then signs the form by hand in ink.

The patient takes this paper prescription to any pharmacy in the country and signs it to claim any exemption from prescription charges that they are entitled to. The drugs are dispensed to the patient,and the pharmacist either takes the standard prescription charge from the patient or performs checks on their exemption. The form remains with the pharmacist until the end of the month. After this time the forms are sent in a batch to the Prescription Pricing Authority (PPA) who deal with the administration of the system. The PPA provides payment to the pharmacies for the drugs dispensed and also checks claims for exemption where no evidence has been shown to the pharmacist.

BENEFITS

The expected benefits from the introduction of ETP in the NHS extrapolated from the research are detailed below:

Fewer medication and transcription errors

It is believed that the eradication of hand written prescription forms will result in fewer medication errors [5] [6] [7] and transcription errors [8][9]. Medication errors *"often occur because of illegible handwriting, confusing drug names and dosage mistakes"* [10]. Transcription errors occur in the present system when prescriptions are re-input from their paper format into the pharmacists and the PPAs' computer systems. It is believed that *"receiving prescriptions direct will reduce transcription errors"* [11]. Both problems are significant issues with the present system. A misread prescription in a pharmacy can lead to the wrong drug being dispensed to the patient and the pharmacist could be subject to a malpractice court case [12]. Transcription errors at a pharmacy could also lead to the wrong drug being dispensed to the patient. Errors in transcription at the PPA would lead to administrative and payment errors to pharmacies. On an organisational scale transcription errors may lead to inaccurate drug utilisation and prescribing statistical information. From previous research [48] the authors had seen that the transcription processes can lead to poor data integrity within a system therefore affecting stakeholders attitudes. In the authors' fieldwork they observed transcription taking place and could see that an ETP system would remove this requirement and reduce the number of mistakes made in

the process. At present it is unknown how high the transcription error rate is at a pharmacy or the PPA. With an ETP system the transcription error rate should be reduced to 0%. Thus ETP is a requirement for transcription errors to be eliminated. ETP can be thought of as a mechanism for ensuring that all practices must use electronic systems for prescribing, but clearly practices can use electronic systems without implementing ETP. ETP is therefore not a requirement for medication errors to be reduced. To ensure fewer medication errors the government could simply require all prescriptions to be produced electronically i.e. prescribed in an electronic application then electronically printed out on paper. However, by implementing ETP, both medication and transcription errors should simultaneously be significantly reduced.

Increased efficiency

Previous research papers [13][14][15][16] highlight one of the benefits of ETP as increased system efficiency. GP surgeries would benefit from improvements made to repeat prescribing (discussed separately) [17] and a reduction in telephone prescription queries from pharmacies [10]. These benefits would not just save time for the GP's but also for the surgeries' administrative staff and receptionists [13]. Pharmacies would benefit from improved efficiency through the reduction in the number of drug queries with GP's, no transcription requirement [8] and savings in prescription collection services [18]. Richard Mulcachy of System Solutions, an Irish ETP provider states *"For the pharmacist a reduction in time spent on computing and endorsing would mean more time available to spend on patient management"* [17]. Christine Clark shares this view in a report of the inaugural meeting of the Guild of Healthcare Pharmacists Information Technology Interest Group, where it was stated that ETP *"can liberate pharmacy time for clinical duties"* [19]. Pharmacists should also benefit from the overall increased efficiency of the system through faster payment cycles [17]. At the PPA, efficiency benefits should be great with the removal of the requirement for the transcription of prescriptions. Looking at things from a patient's perspective they *"believe the new system will be more convenient for them, save them time travelling to a GP surgery and possibly having to travel then to a pharmacy to collect their drugs"* [46].

The authors believe that this efficiency benefit will be one of the most difficult to realise by several of the stakeholders. In general prescribing GP's, especially those who are already using electronic prescribing software, will notice no efficiency savings. Indeed it may take them longer to input a password or PIN, for the digital signature to be created and the electronic prescription to be transferred, than it does today to currently handwrite their signature and give the prescription to the patient. (The GP's should gain efficiency benefits with repeat prescriptions, but this is addressed later.)

The present dispensation process in pharmacies is heavily optimised time wise. There may be small savings to be made, measured in seconds only, in the removal of the requirement for transcription within ETP. However, in the current UK pilot trials, the number of drug queries to GPs actually increased in one ETP pilot, due to the failure rate of reading the 2-D bar codes printed on the prescriptions. Thus the design of the ETP system is critical to efficiency savings in pharmacies.

Clearly the place where efficiency improvements will definitely be realised will be at the PPA, although it may take some time for all practices to adopt an ETP system. This will mean the PPA will require parallel systems to be in place to deal with both

ETP and handwritten prescriptions, perhaps for a number of years, making the system inefficient in the short term.

Better communication channels

ETP would lead to better communication channels between GP's, Pharmacist's and the PPA [46][11][13][20]. H.Middleton believes that *"the goal of seamless care between hospitals, GPs and community care would be a step nearer, if not a reality, with the electronic transmission of information"* [12]. The establishing of improved communication channels could also lead to the establishing of new information channels between GP and pharmacy for the exchange of clinically related information, for example, patients' purchase of over the counter (OTC) medication. Thus the rollout of ETP could be the enabler for better communication channels to be established, and could provide the business case for these channels to be installed. However, ETP in itself is not the channel, it is merely one application that sits on top of and makes use of the channel. Further investment will therefore be needed in the new applications that are to make use of the communications channel provided for ETP.

Fraud reduction

Fraud within the paper based prescription processing system was estimated to be between 70 to 100 million pounds a year [21] prior to the commencement of this research. It is widely believed [46][7][22][11][20][9] that an ETP system can help to reduce fraudulent activity in the prescription processing system. Fraud reduction would come through measures such as reallocation of resources at the PPA from transcription to fraud reduction. Fraud reduction was the principal reason why the authors commenced this research project, and we believe that the introduction of ETP will help in the fight against this criminal abuse of a publicly funded service. It should be noted however, that ETP is not the only or necessary way to reduce fraud. Fraud has been reduced significantly in recent years, by the PPA increasing its policing of patients who claim free prescriptions when they are not entitled to them, and by the introduction of legislation that imposes statutory fines on patients who make false claims. ETP should significantly aid this effort, through the introduction of electronic rather than manual checking of claims.

Repeat prescribing benefits

One of the main areas where ETP is expected to benefit GPs and pharmacies directly is in the transformation of repeat prescribing [17][23]. Repeat prescriptions count for an estimated 70% of prescriptions issued in the UK [51], so any gain here will have a significant impact. ETP should *"eliminate the need to collect scripts from surgery"*[11]. The patient should benefit from not having to make multiple trips to their GP to order to collect repeat prescriptions. Pharmacies that offer script collection services will also benefit from not having to collect scripts from GP surgeries. One study suggests that for pharmacies *"electronic transmission of prescriptions could save pharmacists up to 51.8 working days per year with reference to script collection service"* [20]. The GP's should benefit through reduced administration time requirements with repeat prescriptions. However, there are some potential downsides to ETP. Firstly, some patients in receipt of repeat prescriptions, especially the lone or elderly, actually want to visit their GP regularly, for the social contact that it affords them. Secondly, in the current paper based system, the GP scans the prescription (typically prepared by an administrator) before signing it, and

may make changes to the script. The signed scripts are then held in the surgery and can be altered even after signing, if the GP recollects some factor affecting the prescribing. With ETP, there is the potential for the system to quickly display the prescription on the screen, prompt the GP to sign the prescription, and then immediately transfer the prescription to the pharmacist, giving the GP little time to reflect upon or recall an erroneous prescription. Thus the ETP system has to be well designed with concern taken to reduce the capability for potentially dangerous human computer modes of interaction which can result in medication error with no method of recourse for the prescriber.

Decrease costs

Various researchers have identified one of the benefits of ETP to be decreased costs throughout the prescription processing system. All parties would benefit from a reduction in the expense of the paper based prescribing system [24][15][19]. In the Huddersfield University analysis, GP's, dentists, receptionists and pharmacists identified resource savings as one of the major benefits to be gained from an ETP system. GP's could benefit from reduced administration costs and time savings made from the transformation of the repeat prescribing process. Pharmacists will save time and money from reduced prescription callbacks to patient's GPs and through an improved repeat prescription process. A reduction in the resources required for prescription transcription will be a direct cost saving to the PPA and some pharmacists have suggested this has *"the potential for reducing pricing costs"* [9]. In their fieldwork the authors' observed the rows of data operators at the PPA carrying out the task of transcribing the millions of prescriptions that arrive there each month (current figures are nearly one million prescriptions per working day). If ETP can cut this workforce down by a fraction it will make a noticeable difference to the cost of the prescription process. In fact the authors' believe ETP has the potential to eliminate this workforce altogether in the long term, and therefore make a really significant difference.

Improved quality

The quality of prescriptions produced in an ETP system would be far superior to the present quality of paper prescriptions [25][14][24]. In this context, quality refers to conformance to prescription standards, with regards to both the drugs that are prescribed and the other data that is included on the prescription form. For example, on an electronic prescription there will always be an electronic signature, or the ETP system would refuse to accept it, whereas on paper prescriptions GP's may forget to sign. Missing signatures cause the pharmacist to have to call back the GP surgery, and may delay the drugs being dispensed to the patient.

Research undertaken in the Derbyshire Royal Infirmary (a UK NHS hospital) between 1998-9, found that the quality of prescriptions constructed electronically was far superior to that of present paper based prescriptions [25]. A study has also been carried out into whether computerised prescribing improves the accuracy of drug administration [49]. In the study it was found that computer based prescribing produced a lower error rate (5.5%) from manual prescribing (5.7%) excluding mistimed administration. Fewer instances of timing errors (wrong timing of drug administration) occurred with computerised prescribing. Note however that it is possible to have electronic prescribing (which the majority of GPs today do have) without having ETP. The quality of the drug related data on a prescription is related directly to electronic prescribing, rather than to ETP. Chris Town, the Chief

Executive of North Peterborough Primary Care Trust believes that electronic prescribing will have direct benefits for patients because incomplete prescriptions and queries can reduce patients' speed of access to medicines [13]. Huddersfield University also carried out research on the occurrences of prescription errors within the present paper based system. Drug availability, missing signatures, ambiguous drug quantities and wrong/ambiguous instructions for drugs are all identified as the most significantly occurring prescription errors [46]. ETP will help to eliminate all of these, whereas electronic prescribing will only help to eliminate most of them.

Improved public health

Improvements in the prescription processing system could lead to improved patient care and overall improved public health [26][14][27]. Improved public health will come as a direct benefit of the advantages identified above. Fewer medication and transcription errors will result in fewer medical complications as a result of prescription error. Indeed, Keith Farrar and Ann Slee have recently provided significant evidence for this in their literature review of published evidence for using electronic prescribing and medicines administration in hospitals [50]. Money saved from the consequent reduced litigation and fraud reduction should be used towards the provision of better patient care in the NHS. ETP will help to increase the amount of information available to GP's about their patients. Reports can be sent back to the GP's surgery notifying them when a patient has collected their prescription. This facility simply is not available today without ETP. In research carried out by Kember Associates on behalf of Pharmed [28] 12% of patients stated they had failed to collect their medication with 66% of these stating they had simply forgot. In the more sophisticated ETP applications reminder notices could be sent to patients if they have failed to collect their prescriptions in a certain amount of time.

Time saved by the pharmacist may lead to improved patient education. In the UK Audit Commission's national report on medicines management in UK Hospitals, Exhibit 18 clearly demonstrates the benefits of ETP to pharmacists *"pharmacists are able to devote more time to direct patient care"* [5]. From their observations in practices the authors gained the opinion that the professionals involved would love to spend more time educating the patients but presently they are restricted by the paper based system. Clearly if more practitioner's time can be freed up with ETP then this could increase patient care. However, the authors doubt that ETP in itself will do this, since the efficiency gains for the pharmacist are likely to be minimal. In fact ETP could lead to less patient education and care, as is the case in one UK ETP pilot, where the prescriptions are sent to an Internet based pharmacy. Here the drugs are dispensed from a central warehouse and then despatched by road to the patient's house, so there is zero contact between the patient and the pharmacist.

The generation of extra statistics and increased communication between healthcare providers has the potential to improve public health nationwide. But this will need to be managed carefully. More statistics could be used to coerce prescribers into prescribing less costly and less effective drugs, or could be used to show best practice.

Improved practice

Alongside improved public health there should also be an improvement in practice at the GP surgery, the pharmacy and the PPA [30][15][17]. In the GP surgery the use of an electronic application for the generation of the prescription could lead to *"greater evaluation and assessment of the practice"* [30], *"reduced litigation"* [12] and improved practice through *"greater implementation of evidence based treatments*

and guidelines" [30]. Note however that GPs will need to have the time, resources and will to implement these improvements - ETP is only an enabler of them.

When the electronic prescription is transferred to the pharmacy, the pharmacist's application in conjunction with a decision support system could automatically print out drug labels, keep records etc. But this is nothing special to ETP. The existing systems today typically do this already, as well as being connected to their stock control and re-ordering systems. It therefore becomes incumbent on ETP that it be integrated with existing pharmacist's systems, otherwise it will be a step backwards for them and will be likely to be strongly resisted.

At the PPA real time access to prescribing and dispensing patterns can help target health resources and provide an early warning system for the community [30]. Real time prescribing statistics could also lead to improved public health planning at a governmental level [30]. The PPA is likely to be the major beneficiary from ETP.

BARRIERS

A number of perceived barriers to ETP were also identified in the analysis work. These are detailed below.

Privacy and security

One of the most commonly stated perceived barriers to the adoption of ETP in the UK NHS was the threat to privacy and security [10][31][32][8]. The authors would perhaps place this issue in the benefits section, since a well-designed ETP system can be far more secure than the current paper based system. However, the vast majority of previous research has focused on privacy and security as an issue to be resolved within any potential ETP system, rather than a benefit to be gained. Research carried out with GP's [20], pharmacists [9] and patients [27] reveals that all user groups are worried about the potential threat of hackers and insecure ETP systems leaking personal medical information. However, there is not only the threat of patient privacy but also that of system abuse. In one of the previous implementations of ETP in the Wirral Hospital NHS Trust a serious security problem arose, that of *"a nurse using a doctors password to prescribe illegally"* [12]. Sean Brennan and Alan Spours, two UK NHS electronic record pioneers, state that *"the risks perceived or otherwise, of lax security may be a factor in discouraging trusts from actively driving forward the implementation of EPMA* (Electronic prescribing and medicines administration)" [33]. From the Huddersfield research it seems that all users thought that system security and the potential for system abuse were relatively significant barriers to the success of an ETP system. However, one must contrast this with the current abuse that prevails, whereby thieves can steal prescription pads for their own use, and subordinate staff can forge doctors' hand written signatures. One of the critical success factors of ETP will be designing it to ensure that security is paramount and abuse is difficult to enact, and that the stakeholders can be convinced of this.

Cultural and organisational issues

An article from Economist.com states that *"large* (UK) *government IT projects seem to have a habit of going wrong. They are often late, over budget or both"* [34]. Listed in the article are various examples such as the Swanwick air traffic control centre that was implemented £180m over budget and 6 years later than anticipated. So organisationally there is a history of failure in large IT projects and the development of an ETP system is a large IT project. The prescription process with all its foibles is also thought to be extremely complex providing difficulties for any ETP

system developer [33][13]. Foibles and complexity, such as: the treatment of locums within the NHS who often work for many different practices [12], catering for GP mobility such as during home visits, the use of many different application systems in the NHS [35], and the varying state of organisational computerisation [10], all lead to complexity in both design and implementation. O. Hanseth and E. Monteiro, researchers from the University of Oslo, have carried out research into changing so called 'irreversible' networks which are *"large, complex and highly entrenched actor-networks"* [36]. The authors believe medicinal prescription processing fits this description of an 'irreversible' network, as it involves a large institutionalised system in the publicly funded NHS and there is likely to be strong opposition to change amongst stakeholders. Hanseth and Monteiro believe that *"due to the interdependencies of the elements such networks are difficult to change"*[36].

The authors concur with these findings, and believe that ironically, because the NHS is both national and government run, that these factors in themselves may be significant impediments to the successful implementation of ETP.

Senior management and clinician commitment

The collective attitude of senior management and clinical staff to the adoption of ETP is seen as a potential barrier to the adoption of ETP [33][37][35][5]. In a study carried out in public health care organisations in Hong Kong, investigating the factors affecting the adoption of telemedicine technology, it has been found that the *"collective attitude of medical staff towards telemedicine and its enabled services was the most significant factor"* [37] in deciding whether to implement telemedicine applications or not. S. Brennan and A. Spours share this view. They state that *"Every successful EPMA* (Electronic Prescribing and Medicines Administration) *project to date has stressed the crucial importance of senior management and clinician commitment. In many trusts today, however, there is still neither the understanding nor the commitment to implement advanced EPR functions"*[33]. In research carried out be Kember Associates on behalf of Pharmed, physicians *"were ambivalent towards computer technology, saying that it was of limited importance in their work, preferring paper records"*[23]. This problem was also indicated as a key barrier to be overcome by the research team at Huddersfield University [46]. Thus winning the hearts and minds of senior professionals in the NHS will be a critical successful factor to the UK Governments proposed roll out of ETP.

Cost of transformation

The cost of the transformation process from paper-based prescription processing to ETP is seen by researchers [30][7][9] as a potential barrier to the amalgamation of ETP into the NHS. Transformation costs identified include: the software development [33], and the initial decreases in productivity as clinicians get used to using ETP instead of paper [7]. Frank Quinlan, National Co-ordinator of the General Practice Group in Canberra, Australia in a 2000 paper on the integration of electronic prescribing into general practice in Australia noted that *"Computerisation is generally costly, whether measured in terms of capital outlay, training, maintenance, length of consultation or organisational change"* [30]. In October 2000, Ewan Davis, Chairman of PharMed wrote that *"there should not be any increased workload, without at least a corresponding increase in benefits for that user"* [8]. The authors go further than this, and believe that there should be no workload increase at all for any user in the ETP system unless large savings in time can be identified, as time is clearly invaluable to all users within the system.

Legalities

Prior to the commencement of this research it was illegal for clinicians to sign prescriptions electronically. In prior research this has been identified as a barrier to the successful adoption of ETP [8][12]. However, legislation [38][39][40][41] has now been adopted allowing electronic signatures on prescriptions within the three ETP pilot studies [43][44][45] taking part across the UK NHS. There could still be a problem with the legislation in future, for instance in the areas of control drugs and repeat prescriptions where ETP could require significant changes to legal practice. Thus there is still the potential for *"inappropriately worded legislation and official guidance"* [33].

Technical problems

Multiple technical problems have been identified as being potential issues to overcome in the adoption of ETP in the NHS.

?? Potential downtime is seen as a threat to the smooth operation of an ETP system. [7][9]
?? Transmission reliability is identified as a technical problem, which needs a solution providing assured prescription delivery to the receiving party. [10][28]
?? Extent of computerisation and age of existing systems is also seen as a threat to the smooth adoption of ETP. [46]
?? Maintenance of the system is a potential issue to the ongoing adoption of ETP. [12]
?? Message integrity throughout the process is a challenge which needs addressing. [46]
?? Integration with the numerous legacy systems currently in use is a major hurdle.

In their field work, the authors' noticed the use of many different prescribing and dispensing systems in the sites they visited. Some of these were old MS-DOS based systems, others were newer Windows based systems. The dispensing performance at the pharmacies differed depending upon the dispensing application being used, suggesting some applications are quicker and easier to use than others. Clearly a large amount of work will be required in optimising the electronic systems when ETP is introduced, as the older MS-DOS based systems, which ironically seemed to be the most efficient, will be lost.

Multiple drug codes

In May 2000, Dr Michael Daly, Chief Pharmacist with the Royal Wolverhampton Hospitals NHS Trust stated that *"A fundamental difficulty is the problem of multiple drug codes used by individual trusts, hardware vendors and software developers."* Dr Daly went on to say *"Any single therapeutic entity should have a unique identifying drug code, and the development of this unified drug code is an essential prerequisite for the rapid and safe development of integrated prescribing systems."*[35]. This view is supported by other researchers [33][42][5]. After the commencement of the current research project, the NHS set up a project to develop a single code for each drug, called the NHS Primary Care Drug Dictionary [29]. In December 2002 the outcome of this project was presented to the primary care community and now practices are beginning to adopt this standard set of drug codes. Migration to this standard set should remove this barrier to ETP. But we don't know how long it will take.

Education and implementation

Another barrier to the adoption of ETP by the NHS will be the education and implementation process [12][35][24]. It is believed the software development process is fraught with problems including local customisation, user friendliness, system changeover and clinical decision support integration issues [33]. David Cousins, Chief Pharmacist in the Southern Derbyshire Acute Hospitals NHS Trust noted in 2001 that *"the time and effort needed to change from a paper based system – to an electronic system...is considerable and should not be underestimated"* [25]. The authors believe that the implementation of ETP should be treated by the NHS as a change management project, with the consequent stages of unfreezing, moving and re-freezing of stakeholder positions. Without adequate stakeholder education and persuasion, the forces that oppose change are likely to overwhelm those that want to migrate to ETP.

Professional, Practice and Patient Issues

Issues have been identified affecting all operational practices within each of the users' organisations. GP's are worried that improvements made to the repeat prescription process may lead to loss of contact with patients [23]. Pharmacists are worried about directed prescriptions used within a number of the ETP pilot system designs and feel that this could increase competition between pharmacies [23]. In our own research, pharmacists said they were worried that this could even lead to the demise of many high street pharmacists. This will become more likely as supermarket pharmacies become more widespread. Huddersfield University also found that clinicians and pharmacists are most concerned about the restrictions that may be placed on their present operations with the introduction of ETP into their practices.

"In the current paper based prescription system the professionals employ various tricks of the trade to make the system work more efficiently for them. They also endeavour to provide an acceptable quality of service for their customers. There are a number of systems, which the pharmacists and GP's will use, which may not be accessible with the introduction of an ETP system. For example, at present a patient may attend a pharmacy and request the loan of a small quantity of their drugs until their prescription is written and delivered later in the day. Currently a pharmacy may loan the drugs to the patient, if they have a record of the patient and their medication. They are concerned that this behaviour would be curtailed if there were any delays in the transfer of the prescription, or this service may have to be completely abolished restricting the services they currently provide for their customers." [46]

Clearly the many concerns and fears that the professionals have will need to be allayed, and this should all be part of the change management process. There may also be patient issues with the new system which the professionals will need to deal with on a daily basis. In the results of previous research carried out by Kember Associates [27] only a minority of patients did not like the idea of electronic prescribing. However, these views were based on the understanding that the introduction of electronic prescriptions would lead to time and cost savings. Clearly if in reality the patients aggregated no benefits from the introduction of such a system then their views may change.

SUMMARY

In this paper the authors have identified nine potential benefits to be realised in the introduction of any ETP system into the UK NHS. Alongside the benefits are nine

barriers to be overcome in making this transition process successful. Clearly the system to be chosen nationally for ETP should provide clear details about how each of the potential benefits discussed in this paper are to be realised, and how potential barriers towards integration are to be overcome.

The authors believe the most significant benefits will be a reduction in fraud, a reduction in prescribing errors, and a consequential improvement in patient health care. The supposed increase in efficiency will be the most difficult to realise for GPs and pharmacists, whilst the PPA should be the main beneficiary here. Patients in receipt of repeat prescriptions should also be major beneficiaries unless they actually want to visit their GP for social reasons.

ETP is a risky path for any government to take. Firstly, the government is disadvantaged by actually being the government, since many government sponsored major IT projects have failed in the past. If the project is a success and leads to improvements in the efficiency of the UK NHS, the government will be met with widespread public praise, whilst delayed transition, escalating costs, or system failure will result in public condemnation. Consequently the choice of ETP system and implementation strategy must be considered extremely carefully.

The largest obstacles in the way of the transition process are in the authors' opinions the cost of the transition process and the attitudes of professional stakeholders towards the system's introduction. The implementation of ETP should be treated as change management project. The government must win the hearts and minds of all the major professional stakeholders. Education will be important. Judgements need to be made about the amount of financial support to provide for practices to adopt ETP. No financial backing and/or no benefit or only a small amount of benefit for the stakeholders may result in widespread criticism from them and an unwillingness to embrace the change, with resulting project failure. Patients on the other hand can easily be catered for if the ETP system allows for current patient procedures to optionally go unchanged. Finally, the PPA are likely to be the major beneficiaries from the introduction of ETP.

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FURTHER READING

In the time since this paper was accepted for publishing, another paper assessing the present state of electronic prescribing and medicines administration has been published. The paper expresses the main difficulties being experienced in present hospital based implementations. A reference is provided below:

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