

Patient safety through e-prescribing

Final report from a round table jointly organised by

E-Health Insider

and

British Computer Society Health Informatics Forum

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Participants

Dr Glyn Hayes, GP and Chairman, previous Chairman of the BCS Health informatics Forum, gave his first-hand experience as a GP and former clinical director of GP systems supplier.

Jon Hoeksma, Reporter, Editor E-Health Insider, offered insight based on reporting of the UK health IT sector (report author).

Professor Nick Barber, Pharmacist and Academic, Professor of Pharmacy, University of London, and visiting professor in patient safety, Harvard University, provided insight into the current research base on clinical safety and e-prescribing.

Dr Maureen Baker, GP, National Clinical Lead for Patient Safety, NHS Connecting for Health, provided an overview of the CfH patient safety programme and its planned future development.

Graham Moule, Pharmacist, JAC Computing, gave the insight of a specialist supplier of hospital pharmacy systems into the development of e-prescribing and challenges for the future.

Professor Tony Avery, GP, Professor of Primary Healthcare, University of Nottingham, detailed where the main risks to patient safety arise in prescribing and the primary care experience.

Dr John Parry, GP, Clinical Director, TPP, provided the perspective of a leading GP systems provider

Neil Kirby, Pharmacist (seconded to EPR team), Salford Hospitals NHS Trust, provided the perspective of a hospital in the midst of a complex e-prescribing project and the practical challenges.

Pete Marsh, Chemical Biologist and NHS IT Professional, Director of Wirral Health Informatics. Pete Marsh gave a presentation to the panel detailing the experience of Wirral in implementing e-prescribing over the past 15 years and the patient safety benefits this was found to have delivered.

Dr Brian Robson, GP, Clinical Director for e-Health NHS National Services, Scotland, outlined how the Scottish NHS is approaching e-prescribing as part of its patient safety programme.

Polly Shepperdson, Healthcare Researcher, Product Manager, First DataBank Europe, contributed the perspective of a leading drug knowledge base supplier on the role of clinical decision support in e-prescribing.

Ewan Davis, Primary Care IT Expert and Consultant, Woodcote Consulting, gave the insight of someone who has worked for a series of suppliers closely involved in e-prescribing and electronic transfer of prescriptions.

Dr Jonathan Meadows, GP, Clinical Safety Lead EMIS, gave the perspective of a hospital clinician who had subsequently become a GP and is now the clinical safety lead of a leading GP system supplier.

India Hardy, NHS IT Professional, Head of Electronic Prescribing, Project Chelsea and Westminster Hospital NHS Trust, detailed the experience of her trust's current e-prescribing implementation.

Introduction

The participants in the joint E-Health Insider / British Computer Society round table on patient safety through e-prescribing came from academia, pharmacy, and GP and pharmacy system suppliers. IT professionals with experience of prescribing implementations took part, as did representatives of NHS Connecting for Health and the Scottish national e-Health programme. The day long event was held at BCS's London offices on 30 April.

Chair Dr Glyn Hayes explained that the aim was to examine what the acute sector could learn from primary care, which, since the 1980s, has steadily introduced computer systems and moved towards e-prescribing. Two years ago, 95% of all prescriptions in primary care were being electronically generated. The improved legibility of printed prescriptions has been the key patient safety benefit achieved.

Defining e-prescribing

Despite this, some of the round table participants questioned whether e-prescribing has really been achieved in primary care. Ewan Davis of Woodcote Consulting argued that some aspects of prescribing – such as repeat prescribing – have been computerised.

But even today, he said, many systems don't manage "the whole end to end process, from patient request to scrip being produced, very well." Some participants felt the hospital sector might be trying to create "something that's perfect" that covered all aspects of workflow and clinician support, instead of starting simply and building on what had gone before.

Differences in primary and secondary care processes

However, Dr Hayes said this highlighted different processes in primary and secondary care. Professor Nick Barber summarised these by saying: "In primary care we're talking about order to supply and in secondary care we're talking about order to administer – and they're quite different things."

Other panellists noted this led to a different focus in terms of risk to patients. In primary care, the focus has been on the decision about what drug to prescribe. In secondary care, it has been on safe administration as part of an end-to-end process.

Professor Nick Barber was one of a number of panellists who stressed that this process is carried out under conditions of huge uncertainty, both in terms of whether the drugs will work and what their side effects might be.

He said this meant there was a need for information systems that could support a team-based, ongoing process that reviewed decisions in the light of experience "until you iterate towards a stable platform of medicine."

The development of hospital e-prescribing systems

Given these differences, it is not surprising that e-prescribing systems in primary care and medicines management systems in hospitals have very different antecedents.

Drawing on EMIS's experience as a primary care supplier in the UK and as an acute systems supplier in Canada, Dr Jonathan Meadows said: "You can't take a primary care e-prescribing system and give it to secondary care physicians, because it's completely different, workflow, everything."

Polly Shepperdson acknowledged that while primary care systems cannot transfer directly into secondary care because of the different workflows in the two sectors, the underlying drug database and decision support can be made flexible enough to meet the needs of primary and secondary care. She added that meeting the requirements for secondary care would provide benefits back into primary care.

Addressing e-prescribing in manageable 'chunks'

Following on from the earlier discussion, Graham Moule stressed that e-prescribing in secondary care should cover the administration of drugs, not just their prescription. There was some debate about whether this should link into the dispensing process covered by a pharmacy system, and whether the different steps could be separated.

Professor Tony Avery suggested: "I think we all share a view of what we want to see, [that is] dealing with this end-to-end, in a holistic way – but we can't do that in a single leap." He reiterated that, in his view, one of the key lessons of the primary care experience was that "we've been able to do this in incremental bits over 15 or 20 or more years, and to go at the pace people are prepared to go at."

However, India Hardy said Chelsea and Westminster was working on an end-to-end solution, covering prescribing to dispensing and supply to patients. The hospital had bitten the bullet and had "done it all in one go."

Mapping business processes and tailoring IT systems to sites

Dr John Parry wondered whether one impediment was that many hospitals might be trying to introduce IT to business processes that had never been properly rationalised or even mapped.

Polly Shepperdson of FDBE said that e-prescribing and decision support "needs to support patient pathways and workflow."

During the course of the round table, panellists referred to a number of hospitals in the UK and US that have successfully implemented electronic prescribing systems and published research about them. Polly Shepperdson said that from its work in both the US and UK it was clear to FDBE that there were very different conceptions of e-prescribing, making it difficult to transplant systems from one country to another.

It was noted that these systems have tended to be highly tailored to meet local needs and have proved difficult to transfer to other sites. Dr John Parry said this suggested hospitals were working with "widely variant" processes.

Ewan Davis said “nobody” in the primary care market would have tried to produce a different product for each customer. “You had a standard product... the economics didn’t allow for anything else.”

For more complex hospital environments, he said there would be a core of common requirements and dozens or even hundreds of local requirements. “Dropping a system from, say, the Wirral into another trust might be very challenging.” Pete Marsh said that even at the Wirral there was no single system, but a variety of systems linked by 148 interfaces.

Successfully implementing systems in secondary care

Very few UK hospitals have implemented e-prescribing across their entire sites. One panellist estimated that only five English hospitals have done so, although up to a third may have implemented e-prescribing on one or two wards.

Neil Kirby said the first lesson to learn from these early adopters is that it takes years to implement a system well. As a result, he said it was vital for systems to be tractable, “for the users to be able to alter [them] and create their environment.”

However there was also recognition that flexibility can create problems. Graham Moule said: “If you’ve got a national system which is hugely flexible and every site changes it totally, and then staff move from one site to another, the so-called benefits of usability and safety are not necessarily there.”

Dr Maureen Baker stressed the need to achieve a balance between system flexibility and consistency. “Consistency can be very important for safety, flexibility is very important for ownership. So where do you get the balance?”

Dr Glyn Hayes asked Pete Marsh to what extent success at the Wirral has been due to having an almost home grown system, and whether it could have achieved as much with a bought-in system.

Pete Marsh said they could “if suppliers were amenable” and didn’t seek to make money out of every change, so users could “pick their own screens, write their own reports.”

Engagement with suppliers

Another recurring theme drawn from the primary care experience was the need to avoid monopolies and ensure competitive innovation, with engagement from customers.

Graham Moule said one of the unfortunate consequences of the centralised NHS IT programme – and the shift towards primary care trust responsibility for primary care IT – was that it had removed this direct relationship with customers. “Until fairly recently, the person who paid the bills was also doing the prescribing,” he said. “Now, the customer and the end user are quite different people.”

Connecting for Health’s Dr Maureen Baker said she didn’t want to see suppliers competing on safety, and that if one came up with a breakthrough it should be shared.

Dr Glyn Hayes advocated the establishment of a Chatham House rules-based forum that would encourage open discussion of “ways of handling things better and any potentially adverse incidents

that can take place". Dr Baker said CfH was at an early stage of growing such a forum, a move that was welcomed by other panellists.

Other challenges: engaging end-users

Professor of Pharmacy Nick Barber contrasted the spread of IT systems across hospitals with the development of IT in their pharmacy departments. He said pharmacy was first computerised in the early 1980s, because of the high cost of drugs, but that pharmacy systems spread quickly because they responded to pharmacists' needs.

Graham Moule said that, like primary care, pharmacy was a natural, coherent user group. But getting wider staff groups to agree on what they wanted was far more difficult. India Hardy said one problem was that key users were hard to engage with.

"You want someone quite experienced to be working on the system design, but there's no such thing as an experienced junior doctor," she pointed out. "Once you're an experienced junior doctor then you're on the next level. So we're after this niche that doesn't exist. We've had many consultants who were happy to help design the system, but who wouldn't actually use it."

Getting evidence published to support hospital e-prescribing

Another specific challenge, raised by chair Dr Glyn Hayes, was "how to start providing real evidence about how these things work and whether they do provide the relevant benefits."

He said research evidence to support IT system introduction was particularly powerful in the secondary care sector, but there was a general lack of good, published studies analysing the impact of e-prescribing.

Professor Tony Avery said that the Executive Health Evaluation programme is putting money into evaluations and that a group led by Professor Nick Barber would evaluate the electronic prescription service and examine whether it reduces the rate of dispensing errors. Work is also underway on evaluating the care record service in secondary care, which will include examination of e-prescribing.

India Hardy said that the lack of evaluation had been an omission from the initial implementation at Chelsea and Westminster: "We learnt the lesson with the outpatient prescribing that we didn't do any benefit realisation work and we corrected that before we started our inpatient prescribing."

Clinical coding

As well as the difficulty of introducing e-prescribing systems into heterogeneous hospital environments, the panellists examined the issue of clinical coding across both secondary and primary care.

Dr Jonathan Meadows stressed the need for a common representation for medication records across both sectors. He said that today GP systems are coded, while a secondary care record is narrative text with a few coding tags added onto it. "It's only when you work across the boundary that you suddenly realise that they are completely different perspectives on what coding is about."

India Hardy stressed that if clinicians are to be convinced of the need to code they needed to see immediate benefits.

Common medication record

In a similar vein, participants were asked to discuss the idea of a common medication record, providing a complete list of a patient's current medications, recorded in a standard way, as a good starting point for e-prescribing.

Ewan Davis took up this idea. He said this would deliver benefits and be "doable" while also being "sufficiently challenging to be interesting." Dr Glyn Hayes asked the panel to explore how a single, combined medication record might actually work.

Pete Marsh said it must at least be something that a clinician could refer to and be confident that it was accurate. "I think the problem is ownership," he said. "Who would be responsible for making sure that – at any point in time – that record is correct?"

India Hardy said it would require a governance model, setting out how quality could be maintained and who would have the right to add to or change it and when.

Dr Brian Robson said Scotland has introduced an Emergency Care Summary (ECS). This is a one-way system that twice every working day updates the medication records within GP systems to the central ECS record store. Whilst primarily used in out-of-hours, NHS 24 and A&E, he said the ECS is increasingly being used by hospital pharmacists "as a trusted source of information about the latest GP prescribed medications" information that is used as part of the medication reconciliation process." Pete Marsh said that a similar but manual online look-up was being provided in the Wirral and Graham Moule said the same approach was being used in Hampshire and the Isle of Wight.

European examples of medication records

Jon Hoeksma said a number of European countries are beginning e-health programmes for their common medication records that are often linked to a patient-held smart card. "They've seen that as something that will get clinician buy-in at an early stage and then progress from there."

Electronic decision support for prescribing

Another specific issue that panellists were asked to discuss was decision support. The round table felt decision support systems were good in principle but difficult to get right. Dr Hayes said that, to his knowledge, the one attempt to support drug choice had been Prodigy, which "failed miserably."

Ewan Davis said: "General practitioners are experienced prescribers. [Prodigy] probably wasn't very successful because GPs didn't need to be told for the third time in a day about the appropriate treatment for hypertension. In a hospital environment, the major prescribers are the least experienced people, so there's a different requirement there."

Pete Marsh suggested that systems should have details of the user's knowledge and skills base, to more closely tailor the advice provided to them. However, other panellists returned to the point that hospital prescribing is increasingly a team event – and one that is increasingly driven by protocol.

Polly Shepperdson explained that the role of decision support is evolving to encompass the longevity of secondary care processes but also to manage the blurred boundaries between managing the patient's condition and their medication. Brian Robson noted that medical practice is increasingly protocolised and although Jonathan Meadows stressed the need for this to be codified, Polly Shepperdson highlighted that once codified the additional context of treatment offers opportunities for improved decision support.

“I think safety’s a fantastic driver to make you explain yourself,” said Professor Nick Barber. “If you’re not willing to explain yourself at the point of prescribing then you’ve got to start thinking that somebody’s going to ask you further down the line why you didn’t.”

Striking a happy medium and avoiding ‘alert fatigue’

Professor Tony Avery stressed the need for a happy medium, so that users didn’t suffer alert fatigue, but they still received prompts on contra-indications when required.

Dr John Parry said the experience of computerised alerts was an area in which secondary care should take pains to learn from primary care and not repeat its mistakes. “GPs are getting fed up of the computer alerting them left, right and centre. If this is to be a success in secondary care, it’s really, really important to get it right.”

Dr Maureen Baker told the round table that NHS Connecting for Health was trying to ensure past experience was learned from. She said it was developing an ‘alerting framework’ to ensure a consistent approach across the NHS.

This was welcomed by Neil Kirby, a pharmacist at Salford, who said: “That would be brilliant because one of the things we get tied up with a lot in secondary care is trying, again, to provide an ideal solution. You can’t go anywhere without people talking about alerts and decisions.”

Dr Jonathan Meadows from EMIS said prescribing and drug alerts should be integrated with an electronic patient record system, so that factors such as a patient’s weight and age were checked. “If your actual condition isn’t recorded within your secondary care medical record, your alert system isn’t going to work,” he said.

Who is culpable when errors occur?

Ewan Davis raised the issue of who was blamed when errors occurred, arguing that it tended to be individual doctors and nurses rather than trust boards.

“It seems that one of the drivers that’s missing [for e-prescribing] is that it’s not high enough on the board agenda. Nobody says those figures that we saw are appalling and need to be sorted out, in the same way as they sort out MRSA.”

Dr Maureen Baker said that safety must be at the top of every trust’s board agenda and that safety programmes to ‘design out’ risk would help to put it there.

Need for NHS IT Programme to re-focus on e-prescribing

The panellists recommended that the National Programme for IT in the NHS should re-focus its efforts on e-prescribing because of the huge potential patient safety benefits to be gained from safer prescribing and medicines management in hospitals.

Dr John Parry said that discussion about hospital e-prescribing and how to effectively deliver it appeared to be missing from the national programme's agenda. He said that its benefits should be actively explained and sold to trusts.

Dr Maureen Baker said her focus was to push the safety agenda "What I am here to do is to push safety within CfH, and if we think that there are safety benefits to be had from e-prescribing then I want to see that happen."

Conclusions and recommendations

Conclusions

The primary care experience can only partly inform that of the acute sector, where the nature of prescribing and drug administration is very different. However, the past 20 years has shown that much can be achieved by taking incremental steps; ensuring local ownership of systems; not trying to do too much at once; and focusing on specific problems.

In the hospital sector, only a handful of English hospitals have yet fully installed e-prescribing systems, though up to a third have installed some elements in some wards. The number of full implementations has stagnated over the period of the NHS National Programme for IT.

In hospitals, prescribing is a complex process rather than the one-off act. In order to be most effective, e-prescribing systems should cover both prescribing and the administration of drugs; though not necessarily pharmacy systems in the first instance.

The principal challenges to successful implementations are less about technology and more about clear executive and clinical leadership and commitment to change processes over a sustained period of time. Implementation of e-prescribing is a long-term change agenda.

There is little evidence that standardised e-prescribing systems can be implemented into English hospital trusts. Instead, systems require a significant degree of customisation and local configuration. In addition, the implementation of e-prescribing is heavily dependent on the implementation of other hospital systems – specifically patient administration systems and order communications.

Unless urgent steps are taken at local and national level to accelerate the adoption and implementation of hospital e-prescribing systems they are unlikely to be widely installed within the English NHS in the next 15 years.

Recommendations

- Priority should be given to the development of e-prescribing in hospitals.
- The panel recommended that all hospital trusts should urgently review their plans to introduce e-prescribing at board level and to scrutinise their options.
- The panel recommended that the NHS National Programme for IT should review its priorities around e-prescribing and get it back to the top of the agenda.
- As a useful interim step, the panel recommended that consideration should be given to the development of a combined single medication record containing up-to-date details of all a patient's current medications.
- The panel also agreed that it was necessary to make sure there are risk assessments taking place on these sorts of implementations. And where possible we want to try and produce evidence that they produce benefits.

- The panel also recognised there are quite significant difficulties around the evidence base and getting studies published and publicised and called for steps that would significantly encourage publication of those sorts of results. Too often it was felt that such studies fell between health informatics and medical research camps.
- The panel also called for better mechanisms to be developed to share information and experience in developing and implementing e-prescribing in the NHS. Suggestions included the establishment of a committee, forum or group that would encourage such exchange.
- The panel thought the concept of including an individual prescriber and administrator's competencies as part of smart cards or role-based access, or competency-based access control was an important and valuable idea that should be further explored and had significant potential.
- The panel agreed that something needed to be done on the issue of standardising drug naming and drug databases.