Ward pharmacists’ perceptions on how e-prescribing and administration systems impact their activities

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Drivers for electronic prescribing in UK hospitals

Green light for £260 million technology fund to make the NHS safer

22 May 2013 - 14:28

Doctors and nurses are to get better information about patients so people get safer care thanks to a new £260 million NHS technology fund, announced by NHS England today.

The fund will be available to NHS providers to support the move from paper-based systems for patient notes and prescriptions to integrated electronic records and the development of e-prescribing and e-referral systems.

“This new fund will help patients get better and safer care by giving doctors access to the right information when they need it most.”

Expanding the use of electronic prescribing by doctors and nurses in hospitals will help the NHS saves lives and save money.”

Professor Sir Bruce Keogh, Medical Director of NHS England
Electronic prescribing and medication administration (EPMA)

Reported benefits
- ↓ medication errors
- ↓ adverse drug events
- Access to decision support
- Facilitate formulary compliance
- Enhanced audit trail
- ↑ access to medication orders
- No transcription
- ? working efficiency
- ? satisfaction (HCP and patients)
- ? Cost-effective

Reported challenges
- New medication errors
- ↑ specific medication errors
- Deskilling (doctors)
- Alert fatigue
- Longer to carry out some tasks e.g. changing prescriptions
- Fewer communications with nurses re medication changes

Mehta et al. Pharm J 2008 (281):79-82
Pharmacists are an important safety net......

FINAL report

An in depth investigation into causes of prescribing errors by foundation trainees in relation to their medical education.
EQUIP study.

Tim Dornan (Principal Investigator), Darren Ashcroft, Heather Heathfield, Penny Lewis, Jon Miles, David Taylor, Mary Tully, Val Wass

...however, few studies have investigated the impact of EPMA on pharmacists’ activities.
Project overview

• **Research question:** What is the perceived impact of the ePMA system on ward pharmacists?

• **Aim:** to explore the perceived impact of implementing an ePMA system on the **quality and safety** of ward pharmacists’ activities

• **Setting:** Acute admissions ward, and Medicines for the Elderly ward

• **Method:** Semi-structured interviews with 8 ward pharmacists (approx 30 mins). Written consent was obtained. Deductive thematic analysis.
### Participants and interviews

<table>
<thead>
<tr>
<th>Participant</th>
<th>Years qualified</th>
<th>Acute admission (pre- and post-EPMA)</th>
<th>Medicine for the Elderly (pre- and post-EPMA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - female</td>
<td>4 years</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2 – female</td>
<td>1 year 6 months</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3 – female</td>
<td>2 years 9 months</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4 – female</td>
<td>6 years 6 months</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>5 – female</td>
<td>2 years</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>6 – female</td>
<td>5 years</td>
<td>✓</td>
<td>✓</td>
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</tbody>
</table>
More efficient screening of drug charts and less time spent travelling

“So all the drug charts are accessible to everyone who needs to see them at the same time. I think [with] a paper one, we’d be fighting over it”

Pharmacist 5 (qualified 2 years)

“You’ve got everything in one place……it is useful in that if I’m advising on a patient I can see everything that’s going on”

Pharmacist 4 (qualified 6.5 years)

“There’s a vast amount of information available now when I’m seeing those patients for the first time on ward round that’s available to me that wasn’t available to me pre Cerner … Cerner allows everything to kind of be gathered into one… I find myself being able to screen a drug chart clinically with a lot more information on a ward round”

Pharmacist 1 (qualified 4 years)
Clinical screening: EPMA facilitates access to medication record but is limited by hardware

“I feel that I don’t do as much on the ward in the bay in front of the patient as I used to ... I sometimes find it difficult on the ward to get a computer or you sit onto a computer and then someone comes along and needs the computer and we get bumped off it ... So sometimes that means that you have to go back to your desk and screen things and it is a bit disjointed ... However, it does have its advantages in that, if I have to move across site, which I have to do quite regularly, and I need to screen something else or I need to follow up on something then I can have access to it on a computer, which is useful”. (Pharmacist 4, 6.5 years of experience)
Takes longer to carry out routine ward activities

“It takes longer, yeah... It’s a whole new process of, where do I look for this, where do I look for this... So, there’s just – it’s a slower process overall, yeah”.

Pharmacist 3 (qualified 2.9 years)

Easier to structure ward work

“I think about like what we do on the ward, drug histories, at the start it was quite a slow way of documenting everything, where we were used to just writing everything out. And even still sometimes I do feel the need to write stuff down on paper because I need to go back and ask the patient another question, or go to another source and then go back to the patient. So drug histories are slower in terms of documentation ... I might, say, print off their old discharge letter and go through it with the patient, or make a list from the patient, because I’m just not very good at talking to the patient and typing at the same time”.

Pharmacist 3 (qualified 2.9 years)
## Perceived increase in medication errors

<table>
<thead>
<tr>
<th>Medication errors highlighted</th>
<th>Paper chart</th>
<th>EPMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Selection errors</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>- Duplication</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>- Wrong patient encounter</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>- Dose scheduling error</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>- Overlooked TDM</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>Drug administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Dose omission</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>- Wrong time</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>- Documenting dose for wrong time</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>- Infusions continued after prescription has been stopped</td>
<td>++</td>
<td></td>
</tr>
</tbody>
</table>
Perceived causes of system-related errors

"Doctors ... they prescribe something after 8am and it doesn’t flag then as being due until the next day. That would have never been an issue on paper [drug charts] because all they would have done is circled the box and the nurse would have known to give it for that day.”

Pharmacist 2
(qualified 1.5 years)

What about system-related solutions?

"I think that it’s [errors] potentially slightly gone up, just because again people [are] not being familiar with the system”.  
Pharmacist 2
(qualified 1.5 years)

And perceived human-based solutions

"I’d like to think that, because there are lots of different teams looking at the prescriptions, not just one person, that errors will be identified, similar to if they were written incorrectly. So I don’t think it’s any more or less dangerous than a paper chart because you still should have the same amount of people looking at that prescription and identifying where the errors are before anything [happens].”

Pharmacist 6
(qualified 5 years)
“Every system is perfectly designed to get the results it gets.”

Professor Paul Bataldan, Institute for Healthcare Improvement

Principles of design:
1. Use both knowledge in the world and knowledge in the head
2. Simplify the structure of tasks
3. Make things visible: bridge gulfs between Execution and Evaluation
4. Get the mappings right
5. Exploit the power of constraints
6. Design for error
7. When all else fails, standardize
"But with Cerner it means that you are only specifically interacting with them [patients] ... if we don’t have any questions for them, it removes the need to go and even introduce yourself ... I think that after implementation it’s less time with patients”

Pharmacist 1 (qualified 4 years)

"Taking a device to the bedside still kind of takes away a little bit from a natural conversation because of the inputting you’re doing at the same time as having a conversation with someone. And then you’re inputting information. And I feel like with a chart pre Cerner implementation, the conversation was a little bit more natural”.

Pharmacist 1 (qualified 4 years)

“With the COW while you’re there with the patient, you can go through the medicines, you can also look up things and you can also let them know if they have any questions, for example about what the plan is. You have all that information in front of you ... you can actually go up and show them lots of different information about themselves at the same time, so it’s actually increasing the standard of your interaction with your patient because you can share whatever information you’ve got there about themselves and that’s what they would like to know, essentially”.

Pharmacist 6 (qualified 5 years)
Patient as a defence against medication errors:
1. Volunteered information
2. Provided information when asked
3. Double-checker

Electronic prescribing could be a specific barrier to patients accessing their medication records

“no ‘patient friendly’ interface.....electronic record was less comprehensible to the patient than the paper drug chart”
Unintended consequences

Traditional interactions provide behavioural cues to patients about participation

- For every 24 beds visited, mean time 230 mins, 6.2 new patients were seen and 1.3 patient consultations

More interactions with other healthcare professionals?

“Personally no, I don’t think there is a change in the amount of time interacting with other healthcare professionals”.

Pharmacist 2
(qualified 1.5 years)

“I think we get asked a lot more questions, actually. I don’t know if that’s because… actually, I don’t even know what that is, because I think we all basically got trained around the same time, but I do feel that nurses and doctors will come ask us more questions now which is nice. It’s good to have more interactions. I think with prescribing on Cerner, as well, doctors definitely come and ask us more questions … Time has definitely increased as well, yeah”.

Pharmacist 5
(qualified 2 years)
“The great enemy of communication, we find, is the illusion of it”

William H. Whyte 1950

“....as regards therapeutic drug monitoring, there’s a lot more interaction with the doctors and nurses. Previously, again, you could write it on the drug chart, tell them, you knew they’d see it, but now you actually have to write in a structured note on Cerner, tell the nurses, tell the doctors, and make sure that everyone knows where that is, whereas previously if it hadn’t got handed over from one staff to the next it still would have been on the drug chart and people would have seen it”

Pharmacist 4
(qualified 6.5 years)
Enabling more effective communication

“I suppose Cerner has allowed us – because the notes are there, I always have a much better idea of a patient now. So when I go and talk to the doctor to ask about interventions, I am better informed, so I can anticipate questions that they’re going to ask me. So for example, if a patient’s drug history, medications, weren’t prescribed, I can almost – from reading the clerking notes and things like that, I can decide, well, there might be a reason why that’s been stopped or withheld. So it cuts out unnecessary questioning from me of the doctors”.

Pharmacist 2
(qualified 1.5 years)
Strengths and limitations

Strengths

• Two medically diverse wards
• Trust-wide integration
• Commercial system
• Qualitative approach

Limitations

• Six ward pharmacists, one EPMA system
• Perceptions and reporting/recall bias
• Unknown ward activity contribution of other pharmacy staff
• Focus on ward activities

Figure 10.3 Four dimensional taxonomy of technological aspects of ePrescribing systems to understand local implementation landscape

Savage I, Cornfort T, Klecun E, Barber N, Clifford N, Franklin BD. BMC Health Serv Res 2010;24(10):135
www.eprescribingtoolkit.com
Implications and recommendations

If computers make the lives of clinicians substantially harder, if user-centered design is lacking, if the work is not reimagined for a digital environment, clinicians will become obstacles rather than supporters.

Wachter report. Making IT Work 2016

1. Clinical decision support
2. Choice architecture
3. More computer terminals

How far are we to realising the full benefits of EPMA?

<table>
<thead>
<tr>
<th>Areas explored in this study (ward pharmacy)</th>
<th>Perceived benefit</th>
<th>Perceived challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities (what, how, where)</td>
<td>✅✅</td>
<td>✅</td>
</tr>
<tr>
<td>Prioritisation (when)</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>Medication safety</td>
<td>(✅ post-settling)</td>
<td>✅✅</td>
</tr>
<tr>
<td>Interactions with patients</td>
<td>✅</td>
<td>✅✅</td>
</tr>
<tr>
<td>Interactions with other HCPs</td>
<td>✅</td>
<td>✅✅✅</td>
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“We believe that the target of ‘paperless by 2020’ should be discarded as unrealistic. The goal is not paperless – it is improvement, facilitated by having information where it’s needed, when it’s needed.”

Acknowledgements

Research team: Georgios Karampatakis, Monsey McLeod, Bryony Dean Franklin

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