

Electronic Health Records, and Electronic Prescribing and Medicines Management

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Medical Director, NHS CFH

The current national context

- Nov 2010 – The Information Revolution consultation
- September 2011 – DH announces an acceleration of the dismantling of the National Programme for IT
- Spring 2012 – Information Strategy to be published
- April 2013 – NHS Commissioning Board likely to assume responsibility for national IT

So where are we?

- Electronic Health Records in hospitals
- Electronic records across communities
- Electronic prescribing in primary care
- Electronic prescribing in hospitals
- Coordinated electronic prescribing for patients

2009: The National Patient Safety Agency reports that more than 200 patients every month need further treatment or die because of medication mistakes.



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Children's Books

Baby dies after blundering doctors gave him TWELVE times the normal dose of epilepsy drugs

By DAILY MAIL REPORTER

Last updated at 1:08 AM on 20th June 2010

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A seven-month-old baby boy died after doctors gave him 12 times the correct amount of anti-epileptic drugs he should have received in 24 hours, an inquest heard.

Lucas Holzschelter died at Homerton Hospital in Hackney, east London, as a result of the massive accidental overdose.

Medical staff involved in his care, including a consultant paediatrician, a specialist registrar and a senior house officer, were suspended from prescribing medicine and could still face disciplinary action.



© Channel 4

Lucas Holzschelter, pictured with parents Anna Holzschelter and Benjamin Stachursky, died after doctors gave him 12 times the correct amount of anti-epileptic drugs

After Lucas's death, the senior registrar was forced to take two prescribing tests but failed both.

And a senior manager at the hospital warned that a 'gap in the system' meant a similar incident could occur again because a lack of assessment meant senior doctors might not be competent to prescribe.

A statement from Homerton Hospital said: 'The medical and nursing staff involved were relieved of their responsibility for prescribing and administering drugs pending investigation.'

Dr Andrew Reid, coroner for St Pancras and Poplar, said in the inquest on Wednesday that doctors' neglect was a contributory factor in his death.

Lucas's parents, Anna and her partner Benjamin Stachursky, have since returned

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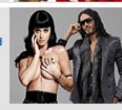
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How do we make a system that makes patients safer, not just one which makes it easier to count the errors?

Medication Errors

High Incidence of low risk prescription errors (Chart not signed/
prescription illegible/ time of admin not ticked/ drug not available/
out of date stock)

....background noise which ePrescribing Systems largely eliminate

Low incidence of High Risk errors (administration errors/incorrect
prescription and drug still given/wrong route administration/
“picking” errors)

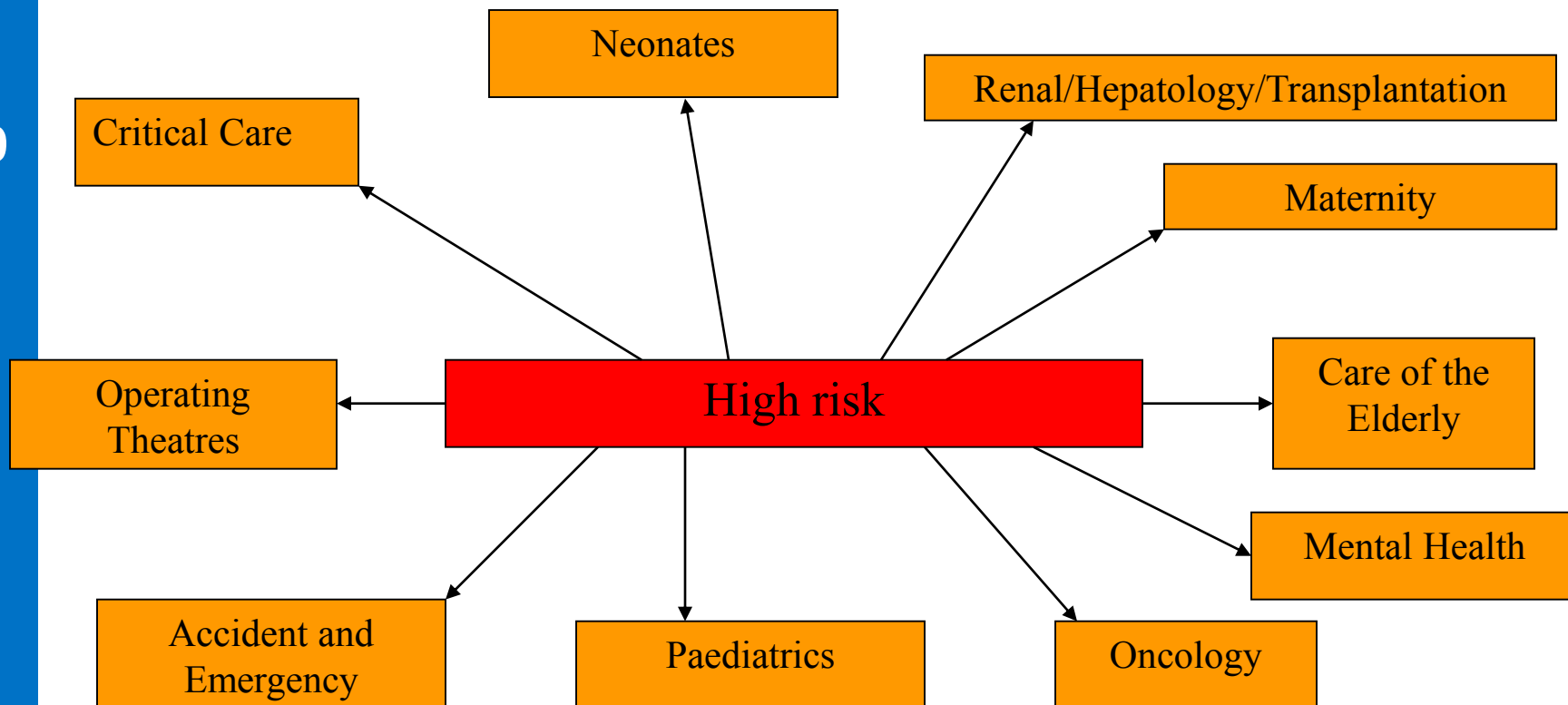
Drivers for Change

- Safety/Quality Agenda/commissioning (Never Events..including new expanded list)
- Patient expectations/medico-legal
- Potential shortfall in Nursing Numbers (especially senior nurses)
- Less experienced junior doctors (WTD)
- Secondary Care is becoming much more complex
- Financial/resource issues
- Population/demographic changes

What Does a Prescriber Want from an ePrescribing System?

- Safe (stop me doing something stupid without adding new risks)
- Intuitive and easy to use/ doesn't require significant training
- Accessible
- No increase in time for prescribing
- UK based system supporting UK style clinical processes
- **System needs to offer advantages over paper systems**
- Key = useful decision support particularly for high risk patient groups and high risk areas (children are 3x as likely to suffer a drug error and the error is more likely to be significant)

High Risk Prescribing



What does someone administering medication want from an ePrescribing System?

- Safe (stop me doing something stupid without adding new risks)
- Intuitive and easy to use/ doesn't require significant training
- No increase in time for drug administration
- Reliable Equipment (works every time)
- System needs to offer advantages over current systems (safer/doesn't require second checker etc.)

Current Situation

- Most acute trusts not using any ePrescribing system
- Systems that are in use are relatively immature
- Niche systems and pharmacy systems more common
- Whole hospital systems tend to avoid the high risk areas
- Move away from large System Deployments (Cerner/Lorenzo) to local solutions
- Everybody wants this to work

Pharmacy Business Technology Group, Commercial Medicines

Unit, in the Department of Health

Recent Survey 2010 (unpublished data)

- Out of the 174 trusts in England, 43 have already identified an ePrescribing solution and of these:
 - 10 have “fully implemented”.
 - 5 have “partially rolled out”.
 - 4 are at a piloting stage.
 - The remainder are at earlier stages in the deployment cycle.
- This leaves 130 organisations that have either yet to start the process, or who did not respond to the survey.

Information on Trusts which have “Fully Implemented” ePrescribing

Trust	System	Comments
Newcastle NHS Foundation Trust	Cerner	Excludes Paediatrics/Operating Theatres/Critical Care No interface with Pharmacy System (JAC)
Great Ormond Street	JAC	No decision support/excludes iv fluids and infusions/ not used in any of the 3 ICU's as “not fit for purpose”/no link to pharmacy
Winchester (2 Trusts)	JAC	No comments, but JAC does not support paed decision support
Doncaster Foundation Trust	JAC	Excludes Paediatrics and Critical Care. No out patient prescribing.
Birmingham Heartlands	JAC	Excludes Paediatrics/ Critical Care/Fluids and Infusions. Not fully rolled out in “out patients”
UHBirmingham	PICS “In House”	Excludes Paediatrics/ fluids and infusions/Chemotherapy/out patients
Sunderland Hospitals (2 Trusts)	Meditech	
Burton NHS Trusts	Meditech	Looks very old fashioned

ePrescribing v. Medicines Management

Implementing ePrescribing System should include;

- *Electronic Prescription Systems (esp in high risk areas)*
- *Knowledge Support*
- *Clinical Decision Support*
- *Advanced Decision Support*
- *Intra-operability with Other Clinical Systems (esp Pathology)*
- *Support for Drug Administration*
- *Networks and Hardware (Wireless Network/Computers/Pyxis Cabinets/Barcode Readers/Intelligent Infusion Pumps)*

Important Features of ePrescribing Systems

- Safety Critical
- Business Critical
- Like life support devices...they should have 24/7 backup and should not be allowed to fail

By Jane Metzger, Emily Welebob, David W. Bates, Stuart Lipsitz, and David C. Classen

Mixed Results In The Safety Performance Of Computerized Physician Order Entry

ABSTRACT Computerized physician order entry is a required feature for hospitals seeking to demonstrate meaningful use of electronic medical record systems and qualify for federal financial incentives. A national sample of sixty-two hospitals voluntarily used a simulation tool designed to assess how well safety decision support worked when applied to medication orders in computerized order entry. The simulation detected only 53 percent of the medication orders that would have resulted in fatalities and 10–82 percent of the test orders that would have caused serious adverse drug events. It is important to ascertain whether actual implementations of computerized physician order entry are achieving goals such as improved patient safety.

Feedback from pharmacists at early adopter sites:

- Current systems have extremely poor “Usability”
- There isn’t a really good system out there...if there was everyone would buy it!
- There are significant issues with Hardware and WiFi Networks
- Deployment is extremely difficult (Building Order Sets etc)
- Trusts are not really deploying into high risk areas (esp. Paeds)
- It is difficult to collect evidence showing improved safety or lowered costs
- Poor working relationships with suppliers (Changes to systems take years to implement)

Feedback from pharmacists at early adopter sites: 2

- Data is not transferrable between systems (esp. other ePrescribing systems such as critical care)
- Integration with other clinical systems (pathology etc) may be impossible
- Decision support is difficult (level of alerting is problematic)
- Maintenance of Systems post deployment is expensive and difficult
- Training is a huge issue
- Need the development of Clinical Informatics Team

Newcastle upon Tyne Hospitals

Project initiation April 2008

- *Full Time personnel from August 2008*
- *Build complete August 2009 (12 months)*
- *Roll out began 30 November 2009*
- *Initial 3 wards (1 per week & review)*
- *Accelerated roll out (3 wards per week from January 2010) –2/3 team approach*
- *29 wards live*

Full-time personnel

- Lead Pharmacist
- Support Pharmacy Technician
- Project Nurse
- Project Manager
- ePrescribing lead (highly experienced)
- Programme IT support (not project specific)
- Training Staff

Ad hoc project team (weekly meetings)

Two consultants
One Specialist Registrar
Two ward sisters
Three Assistant Directors of Pharmacy

What Doctors, Nurses, Pharmacists from early adopter Trusts say about their E-prescribing Systems?

“Nobody gave me any training....I had to learn on the job” (junior doctor A and E)

“The wifi Network is useless wandering around the ward the patient, trying to find a Nurse”

It's not exactly user friendly (just about everyone at every site visited!)

“I make more prescribing mistakes now than I did before the system was introduced” (junior doctor)

“Please take the system out”

(ward Sisters)

“It takes years to get the

supplier to make “I put 2000 hours work into a Paeds drug database...only changes to the system to disc “Would I do it again?...NO!” (E-prescribing leads)”

(IM and T E-pres owners) (Pharmacist)

“We spend several days each month re-mapping the decision support from First Data Bank” (Pharmacist)

“Nurses have much less time to spend with patients” (ward Sister)

“We didn't get any change out of 2 million pounds...just for a basic E-prescribing system on the Intensive Care Unit” (ICU Consultant)

“...they are not replaced, sometimes the drug round is delayed for hours trying to find a computer that works” (ward Nurses)

“All the Consultants want is an electronic version of the paper drug charts” (Pharmacist)

“Every month the system goes down for 45 mins and no-one in the Trust can prescribe anything” (Pharmacist)

Challenge of ePrescribing for Secondary Care Trusts

- E-Prescribing Systems are complex, safety critical, expensive and extremely difficult to deploy
- Very few people (Clinicians/ IM and T Staff/ Pharmacists/ Suppliers) have the necessary experience in deploying these systems
- Resources are becoming more and more limited
- Large Number of Trusts (@180) wanting to deploy systems simultaneously over a short period of time

The top ten pitfalls

[From Prof David Bates at Harvard]

Preparation:

1. Don't recognize how big a change this truly is
 - Expensive
 - Huge process change!
2. Failure to sufficiently engage both administrative and clinical leadership
3. Failure to do necessary preparation with key stakeholders
 - Often takes 2 years to have all the key groups meet

The top ten pitfalls

Implementation:

4. Going too fast early on—e.g. turning on whole hospital at once
5. Trying to fix previously existing policy problems at the time you implement
 - Easy to get stuck
6. Turning on too much decision support early on
 - Much better to phase in

The top ten pitfalls

Implementation:

7. Failure to provide users an easy mechanism for reporting on-going problems
8. Failure to make sufficient changes to application
9. Failure to devote sufficient resources to making changes to the application
 - Won't get value
10. Insufficient support for the underlying system
 - Keeping network up to speed
 - Having enough terminals

What has NHS CFH been doing?

- Draft design specification for safety features required by NHS electronic prescribing systems
 - Systematic reviews
 - Expert panel
 - Delphi consensus process
 - National consultation
- ePrescribing functional specification for NHS trusts, 2007
- Electronic Prescribing Systems Evaluation, 2009
- Strategy to support successful implementation of decision support for ePrescribing systems
- Assessment of lessons learnt from implementation of ePrescribing systems in the UK, 2009
- Dose Range Checking Guidance, 2009
- Hazard Framework for ePrescribing Decision Support, Feb 10

Central E-Prescribing Team (CfH) publications

- ePrescribing Functional Specification for NHS Trusts (2007)
- Electronic prescribing in Hospitals-the lessons learned (2009)
- Electronic Prescribing- briefing for the implementation team (2008)
- Electronic Prescribing Systems Evaluation (2009)
- An Outline Approach for Identifying the Local Minimum Requirements for an ePrescribing System (2009)
- Guidelines for Hazard Review of ePrescribing Decision Support (2009)
- Allergy Checking in Secondary Care (2009)

NHS
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Electronic prescribing in hospitals

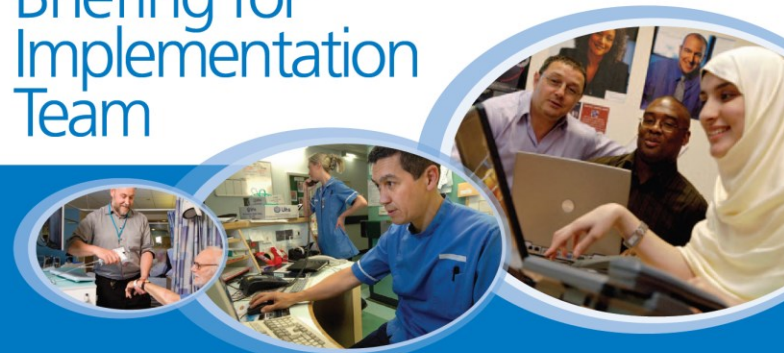
Challenges and lessons learned

Electronic Prescribing

Electronic Prescribing:

Briefing for Implementation Team

NHS
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Introduction

Electronic prescribing (ePrescribing) systems can help improve the safety and efficiency of healthcare by aiding the choice, prescribing, administration and supply of medicines.

The safety and effectiveness of ePrescribing systems depends on all staff groups being actively engaged in their development and use.

Benefits of ePrescribing include:

- Prescribers accurately and clearly enter complete medication orders.
- As they do this the system can provide relevant patient information, for example on allergies, as well as details about drugs. ePrescribing systems can also offer advice or warnings as prescribing takes place.
- Prescription data can be stored securely and communicated to other members of the healthcare team without the risk of paper records being lost.
- Pharmacists can access drug orders remotely using the computer, and check and amend as required.
- Nurses who administer medicines have clear and legible medication orders. The system may help them to prepare for drug rounds, confirm the identity of patients, and record administration.
- Medication records can be accessed remotely by healthcare professionals.

Not all ePrescribing systems fully support all these aspects of medicines use, but most do to some degree.

ePrescribing systems provide a full audit trail and the data they hold allow many innovative uses that can help in medicines management and support a culture of reflective practice.

ePrescribing is a powerful and important innovation for the whole care team. When ePrescribing projects are being planned it is important that all healthcare professional groups are involved and that they remain involved as the system comes into use.

A successful initial implementation is the start, not the end, of running a successful system.

ePrescribing System Evaluations – January 2009, Version 1.1

4. Table One – Overall Results Summary

The scores outlined below do not in themselves represent a level of compliance for a particular area and should be used as relative comparators only.

Supplier	Weight	Alert	Ascribe	Atkosoft	Cambio	CIS	EPIC	FileTek/ Meditech	JAC	Orion	UHB	Varian
System Version		Release 2.4.2	v9.12	v2.0.34	Release 7.2	v3.5.2x	Spring 08	v6	v4.47	v3.1	v156	v8.5
1. Front Line Clinical Review *	48	28.13	33.12	15.92	18.29	26.71	35.40	28.04	30.98	22.11	31.59	19.04
Retrieve Medication History	7	5.40	5.22	3.51	3.31	4.40	5.35	4.96	4.99	5.03	5.04	3.83
Prescribe Inpatient Medicines	7	4.23	4.73	3.35	2.77	4.39	5.21	3.64	4.19	3.89	4.60	2.80
Decision Support	5	3.03	3.21	1.45	2.57	2.96	3.84	3.33	3.69	2.90	3.37	2.07
Prescribing Off Formulary & Predefined Prescriptions	5	2.71	3.70	1.79	1.99	2.49	3.75	2.35	3.39	1.82	3.11	2.66
Pharmacy Verification	3	1.20	2.18	0.17	1.12	1.83	2.25	1.80	1.67	0.91	2.00	1.29
Additional Prescribing Functionality	7	3.98	4.93	2.38	2.29	3.39	4.92	3.83	4.48	2.51	4.28	2.88
Administration	7	4.22	4.44	2.53	2.78	3.77	5.18	4.18	4.21	2.79	4.74	2.12
Discharge Prescribing	7	3.35	4.70	0.75	1.47	3.48	4.90	3.95	4.38	2.26	4.45	1.39
2. Front Line Clinical Impressions *	7	2.87	5.88	1.32	0.49	1.82	6.68	4.62	6.29	0.50	5.90	0.72
Overall Impressions	7	2.87	5.88	1.32	0.49	1.82	6.68	4.62	6.29	0.50	5.90	0.72
3. Functionality **	6	3.28	5.32	4.63	1.88	4.02	5.57	5.96	4.64		4.24	4.61
Functional Spec Conformance	6	3.28	5.32	4.63	1.88	4.02	5.57	5.96	4.64		4.24	4.61
4. User Interface Review *	14	10.23	11.52	9.05	8.41	10.86	13.10	11.26	11.49		11.59	8.14
User Interface Review	14	10.23	11.52	9.05	8.41	10.86	13.10	11.26	11.49		11.59	8.14
5. System Technical Spec **	10	8.02	6.32	6.46	4.75	6.70	8.33	6.09	5.42		7.56	9.27
Conformance to CFH standards	4	3.65	3.65	2.26	2.26	1.57	3.39	2.26	1.57		2.96	4.00
Use of 3 rd Party Information	3	2.61	0.39	1.70	0.20	2.80	2.61	1.50	1.70		3.00	2.80
System Platform	3	1.76	2.28	2.50	2.29	2.33	2.33	2.33	2.16		1.60	2.47
Sub Total	100	52.53	62.16	37.38	33.81	50.11	69.08	55.97	58.82	22.61	60.88	41.78
6. Long Term Partnership	15	2.50	6.32	2.70	2.74	3.20	10.25	9.08	9.39		1.72	3.60
Support and Development **	4	2.50	3.12	2.70	2.74	3.20	2.70	2.78	3.24		1.72	3.60
Live Site Reference Visits *	11		3.20				7.55#	6.30***	6.15			

KEY: * Scored by NHS staff, ** Score by suppliers, *** Filetek / MEDITECH live site reference visit took place at a site with a version 5.4 system, # US Site

National standards

EPS 2	Electronic prescriptions service 2
DM&D	Dictionary of medicines and devices
CUI	Common User Interface

Why?

Safety

But, perfection v. good enough

For more information:

<http://www.connectingforhealth.nhs.uk/systemsandservices/eprescribing>