

REDUCING MEDICATION ERRORS WITH ePMA: 7 YEARS EXPERIENCE

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OUR HDFT JOURNEY

■ March 2011

- commenced project
- ISOFT Medchart as beta testing pilot agreed
- BC agreed November 2011

■ April 2012

- Theatres / PAU/ Surgical Ward
- Medical ward

■ October 2012

- Fully rolled out medical and surgical wards
- ITU

■ December 2012

- Paediatrics / SCBU
- Maternity

■ 2013/14

- Clinical protocols e.g. surgical enhanced recovery
- ITU protocols
- Antibiotic Dashboard

■ 2014 /15 Safer Hospital Safer Ward Fund

- Emergency Department
- Off site community hospital / wards
- (Outpatient)
- (Complex Infusions)
- Warfarin / insulin
- Antibiotic stewardship

OUR HDFT JOURNEY (CONT.)

■ 2015

- Missed doses work program refresh
- ePMA / ICE Discharge Prescribing Interface (TTOs)
- Insulin safety and dashboard
- DSU / Endoscopy / Radiology
- Nurse Training refresh

■ 2016

- Warfarin dashboard
- Level 2 reviews
- Pharmacist ward round checks – high risk patients
- Technician supply dashboard

■ 2017 /18

- Respiratory bundles
- Planning complex infusions
- Hardware refresh
- Significant software upgrade
- Awaiting OP software release and testing

FROM OLD TO NEW.....

Medicines must NOT be administered until this section has been completed.

Medicine / Substance	Reaction	Sign (NAME)	Date
Penicillin		[Signature]	19/12/11

Allergy status unconfirmed. Authority to administer medicines ceases after 24 hours.

Sign (NAME)	Time & Date

Self Administration Level
(Leave blank if patient unable to self-administer as medicines)

Level	Date	Sign (NAME)

Regular Medicines

Drug (6)	Month & year	Date	Time	Sign
RAMIPRIL	Dec 11	19/12	14:20	[Signature]
Route: PO	Additional instructions:	Date: 19/12	Time: 13:14	Sign: [Signature]
Dose: 5 mg	Pharm: [Signature]	Supply: [Signature]	Date: 13-14	Time: 13:14
Sign (NAME & Bleep): [Signature]	Pharm: [Signature]	Supply: [Signature]	Date: 13-14	Time: 13:14
Drug (7)				
IRVORALDE				
Route: PO	Additional instructions:	Date: 19/12	Time: 13:14	Sign: [Signature]
Dose: 20 mg	Pharm: [Signature]	Supply: [Signature]	Date: 13-14	Time: 13:14
Sign (NAME & Bleep): [Signature]	Pharm: [Signature]	Supply: [Signature]	Date: 13-14	Time: 13:14
Drug (8)				
FLUOXETINE				
Route: G	Additional instructions:	Date: 19/12	Time: 13:14	Sign: [Signature]
Dose: 20 mg	Pharm: [Signature]	Supply: [Signature]	Date: 13-14	Time: 13:14
Sign (NAME & Bleep): [Signature]	Pharm: [Signature]	Supply: [Signature]	Date: 13-14	Time: 13:14
Drug (9)				
FLUOXETINE				
Route: IV	Additional instructions:	Date: 19/12	Time: 13:14	Sign: [Signature]
Dose: 20 mg	Pharm: [Signature]	Supply: [Signature]	Date: 13-14	Time: 13:14
Sign (NAME & Bleep): [Signature]	Pharm: [Signature]	Supply: [Signature]	Date: 13-14	Time: 13:14
Drug (10)				
FLUOXETINE				
Route: PO	Additional instructions:	Date: 19/12	Time: 13:14	Sign: [Signature]
Dose: 20 mg	Pharm: [Signature]	Supply: [Signature]	Date: 13-14	Time: 13:14
Sign (NAME & Bleep): [Signature]	Pharm: [Signature]	Supply: [Signature]	Date: 13-14	Time: 13:14
Drug (11)				
ALOPROLOL				
Route: PO	Additional instructions:	Date: 19/12	Time: 13:14	Sign: [Signature]
Dose: 25 mg	Pharm: [Signature]	Supply: [Signature]	Date: 13-14	Time: 13:14
Sign (NAME & Bleep): [Signature]	Pharm: [Signature]	Supply: [Signature]	Date: 13-14	Time: 13:14



ISoft Patient Centre

6007 Patient Centre 431108

User Name: DAN SMILLIE - Hospital DNG
Access Code: 05 - Server: P00

00006100 DYSON, MICHAEL SMS-000003 12/12/1969 41Y Dth Inp

SR

Prescribing

Name: DYSON, MICHAEL PAS No: 00005100 MIS No: Unrecorded
Address: Residence Greyfriars, Beechfield Road, Alderley Edge, Macclesfield SK9 7AU DOB: 12-Dec-1968 Height: Unknown
Age: 42 years Weight: Unknown
Contact: Home 0121 121 1212 Gender: Male BMI: Unknown
Localities: Rock Ward, Room RT, Bed 2 Marital Status: Married/De facto BSA: Unknown
Consultant: V Abbott

Allergies: Substance Allergy to Aspirin - Causes stomach upset

Medication

Medication	Times	Pharmacy
Atenolol 50mg Tablet DOSE: 50 mg Oral Three Times Daily (08:00, 13:00, 18:00) for 14 days	08:00 13:00 18:00	
10-Feb-2011 DAN SMILLIE		
ES cream Cream Topical/Cutaneous Twice Daily (08:00, 18:00) for 5 days	08:00 18:00	
10-Feb-2011 DAN SMILLIE		
Paracetamol 500mg Capsule DOSE: 500 mg Oral In the Morning (08:00) for 7 days	08:00	Created 10-Feb-2011 11:12 by DAN SMILLIE

11:14 20/01/2011

Hide Keyboard

Remote Prescribing possible where appropriate

Improved Antibiotic Stewardship Across HDFT

Prescribing by protocol – improved prescribing quality

100% legibility meeting prescribing quality stds

100% allergy documentation completion

100% Prescriber Identification

90% reduction in allergy incidents

80% reduction in missed doses

50% reduction in medicine administration errors

Zero patients on ePMA receiving a medicine to which they were allergic 2012/13

The screenshot displays a patient's medical record for Michael Dyson (SMS-00003, DOB: 12/12/1969). The record includes patient details, allergies (Substance Allergy to Aspirin), and a medication list with scheduled doses. A central image shows a healthcare professional measuring a patient's blood pressure.

Medication	Dose	Frequency	Start Date	End Date
Atenolol 50mg Tablet	50 mg Oral	Three Times Daily	10-Feb-2011	10-Feb-2011
E45 cream	Topical/Cutaneous	Twice	10-Feb-2011	10-Feb-2011
Paracetamol 500mg Capsule	500 mg Oral	In the Morning (08:00)	10-Feb-2011	10-Feb-2011

Zero missing charts or charts sent to pharmacy saving estimated 3650 hrs. nursing time p.a.

Real time medicines information to support decision making

Identification of specific high risk groups / medicines

Zero chart "re-writes" saving estimated 912 hrs. doctor time p.a

Clear documentation of pharmacist level 1 and level 2 safety checks

Full audit trail to support medicines security incident management

Full audit trail to support incident management and learning

Full audit trail of prescriber, nurse, pharmacist actions.

Refocus of pharmacist interventions to clinical quality from legibility



EARLY BENEFITS 2012/13

- Increased staff productivity
 - £45,000 annual (2012/13 data)
 - No rewriting charts, no lost charts, no bringing chart to pharmacy
- Patient Safety – cost avoidance of potential and actual harm
 - £1.89M cost avoidance (using Datix reported errors and NICE costing model below)
 - (<http://www.nice.org.uk/guidance/psg001/resources/systematic-review-for-clinical-and-cost-effectiveness-of-interventions-in-medicines-reconciliation-at-the-point-of-admission>)
- 80% reduction in missed doses
- 100% allergy documentation completed
- 90% reduction in allergy incidents
- Recording of course length for antibiotics improved 74%, improving antimicrobial stewardship
- Recording of indication for antibiotic therapy appears on 80% of prescriptions

EARLY BENEFITS 2012/13

- Legibility and completeness of prescriptions
- Prescription always available at point of need and at multiple sites, saving staff time
- Ability to target clinical pharmacist activity to patients with greatest need
- Ability to restrict the prescribing of high risk drugs to specific clinicians
- Ability to track and audit changes in drug treatment during admission

ONGOING SAFETY MONITORING (2012 ONWARDS)

1. We have collected incident and error data as reported on the Trust DATX system, between 2011/12 (pre ePMA baseline) and for the next 4 years with 2015/16 data up to and including September 2016. We have used a range of parameters to best represent the data we have been monitoring. These include

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 - Total number of medicines incidents and error reports
 - Total number of errors all types
 - Total number of medicines incidents and error reports
 - Total number of administration, prescribing and allergy errors
 - Total number of administration, prescribing and allergy errors prescribed on ePMA
 - The number of administration, prescribing and allergy errors prescribed on ePMA
 - The number of administration, prescribing and allergy errors prescribed on ePMA
 - The number of occasions a patient has been given a medicine to which they are allergic which has been prescribed pre and post ePMA
 - The number of occasions a patient has been given a medicine to which they are allergic which has been prescribed pre and post ePMA
 - The number of delayed and missed doses
 - The number of delayed and missed doses

ONGOING SAFETY MONITORING – CHOOSING A DENOMINATOR

- We have used a range of denominators to best represent the data and these include
 - Total number of reports and / or errors to give % of errors by type or **error rate /100 reports**
 - Total number of prescribed ePMA doses to give an **error rate per 100,000 prescribed doses**
 - Total number of administered ePMA doses to give an **error rate per 100,000 administered doses**
 - Total number of FCEs to get an error rate per **1000 FCEs**

ONGOING SAFETY MONITORING

- We have calculated an **adjusted administration and prescribing error number** (and rate) for each year.
- This takes into account the growth in Trust incident / error reporting rates.
- The adjusted error rate is based on the rate of errors per 100 reports in the current year adjusted by the numbers of reports in the comparator year.
- The proportion of errors in the given year remains the same using this methodology though this generates an adjusted number of errors and can be used with the cost benefit analysis

SAFER PRESCRIBING FOR INPATIENTS

Year	Number of adjusted prescribing errors per 100,000 prescribed doses reported via Datix
2011/12 (Pre ePMA)	3.43
2012/13	3.25
2013/14	3.19
2014/15	2.12
2015/16	3.34
2016/17	3.12
2017/18	2.86

Table 21: Number of adjusted prescribing errors

SAFER ADMINISTRATION OF MEDICINES

Year	Number of adjusted administration errors per 100,000 administered doses reported via Datix
2011/12 (Pre ePMA)	8.34
2012/13	3.44
2013/14	3.56
2014/15	5.34
2015/16	6.24
2016/17	3.80
2017/18	3.31

Table 23: Number of adjusted administration errors

LEVELS OF HARM CAUSED BY MEDICINES ADMINISTRATION ERRORS (Datix)

Year	Levels of harm (%)		
	No or low harm	Moderate harm	Severe harm
2012/13	85%	15%	0%
2013/14	91%	7%	2%
2014/15	88%	8%	4%
2015/16	88%	11%	1%
2016/17	94%	6%	0%
2017/18	97%	3%	0%

Table 24: Levels of harm caused by medicine administration errors

REDUCING MISSED DOSES AND ENSURING THE TIMELINESS OF MEDICINES ADMINISTRATION (DATA TAKEN FROM ePMA)

Year	% Delayed doses	% Missed doses
2012/13	2.6	2.99
2013/14	2.9	3.17
2014/15	2.6	2.13
2015/16	2.0	0.96
2016/17	2.0	0.83
2017/18	2.0	0.76

Table 25: Delayed and missed medicine administrations

PROGRESS ON REDUCING MISSED DOSES AND ENSURING THE TIMELINESS OF MEDICINES ADMINISTRATION

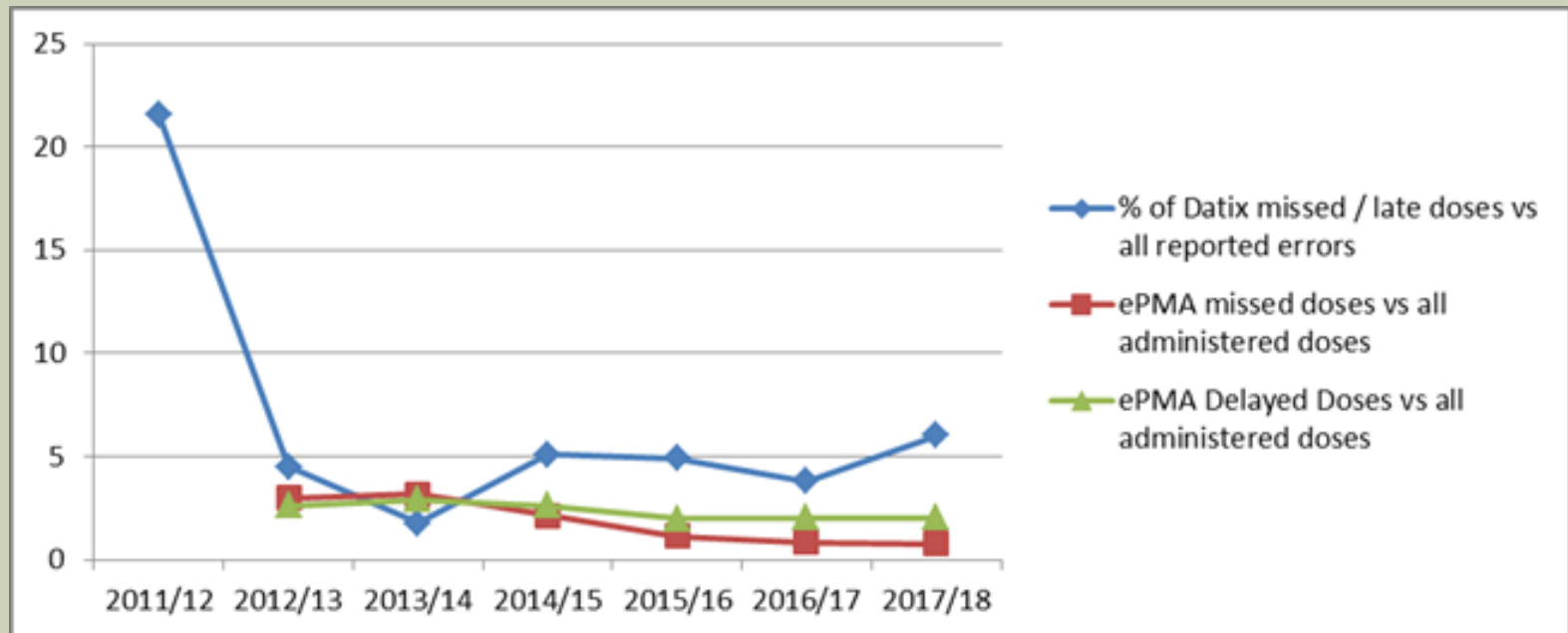


Figure 10: % missed and late doses from Datix reports and ePMA (2011/12 – 2017/18)

REDUCTION IN “POTENTIAL” PRESCRIBING ERRORS THROUGH PHARMACIST ACTIVITY AND IMPLEMENTATION OF ePMA

Year	Total number of:				Levels of potential harm			
	pharmacist interventions	potential harm interventions	unclassified interventions	actual harm, interventions	Minor	Moderate	Major	Severe or life threatening
2011 /12	254	206	30	14	127	0	68 (27%)	11 (4%)
2015 /16	250	250	0	0	133	84	31 (12%)	2 (0.8%)
2016 /17	190	190	0	0	81	100	17 (9%)	0 (0%)
2017/18	481	481	4	0	295	121	51 (11%)	2 (0.4%)

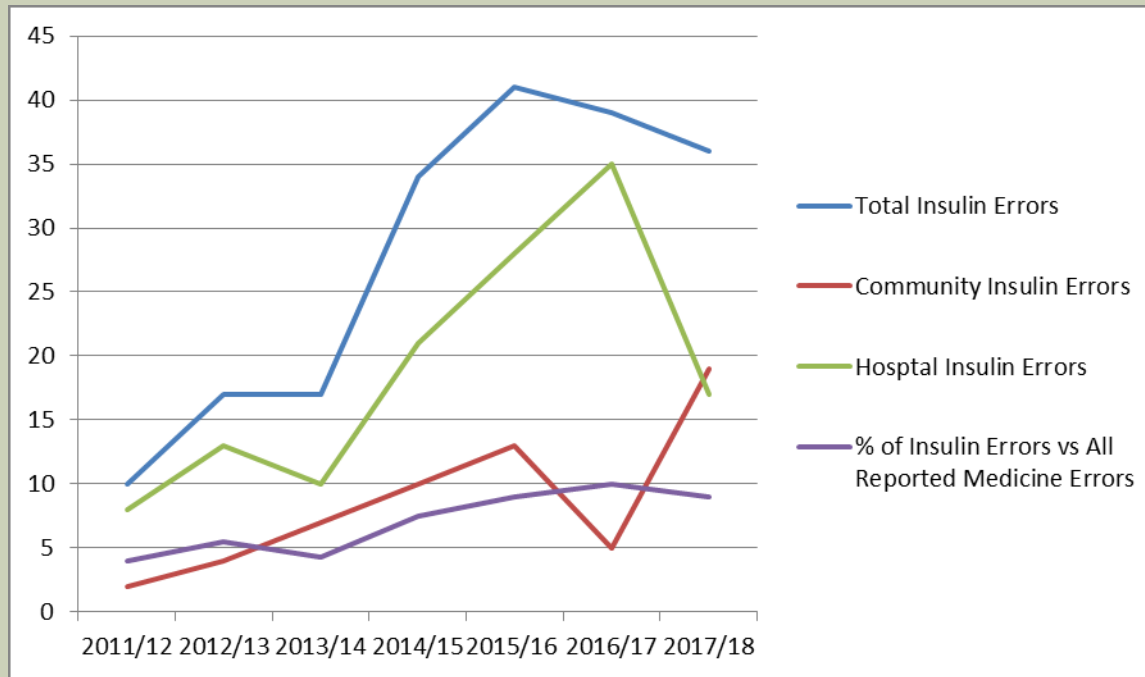
Table 26: Pharmacist intervention audit data

REDUCTION IN PATIENT IDENTITY ERRORS (PATIENT “A” RECEIVING PATIENTS “B”s MEDICINES)

Year	Number (and % of all medicine errors) of patient identity errors reported via Datix
2011/12 (Pre ePMA)	15 (6.1%)
2012/13	4 (1.12%)
2013/14	4 (1%)
2014/15	8 (1.95%)
2015/16	8 (1.78%)
2016/17	5 (1.45%)
2017/18	5 (1.23%)

Table 28: Patient identity errors from Datix reports

SAFE USE OF INSULIN: IMPACT OF INSULIN SAFETY WORK incl ePMA INSULIN DASHBOARD (Datix REPORTED ERRORS)



SAFE USE OF INSULIN – LEVELS OF HARM

Year	No: Low Harm	Moderate Harm	Severe Harm
2015/16	83%	12%	2%
2016/17	92%	8%	0%
2017/18	100%	0%	0%

Table 29: Levels of harm caused by all reported insulin errors

SAFE USE OF INSULIN – NATIONAL DIABETES INPATIENT AUDIT (NADIA 2016/17) - % OF PATIENTS EXPERIENCING AN INSULIN “ERROR”

Year	HDFT	Quartile	England
2010	27.3%	Quartile 3	25.8%
2011	46.2%	Quartile 4	22.7%
2012	20.0%	Quartile 2	21.8%
2013	30.0%	Quartile 4	20.7%
2015	34.4%	Quartile 4	22.6%
2016	25.0%	Quartile 3	22.7%
2017	4.8%	Quartile 1	18.6%

Table 30: National Adult Diabetes Inpatient Audit (NADIA) Report 2016/17 – Insulin Errors 2010-2017

REDUCING MEDICATION ERRORS WITH ePMA: 7 YEARS EXPERIENCE - SUMMARY

Error type reported	Pre ePMA 2011/12	Post ePMA 2017/18	% reduction
Prescribing errors (Datix) – per 100,000 doses	3.43	2.86	16%
Administration errors (Datix) – per 100,000 doses	8.34	3.31	60%
Missed doses (Datix)	2.99%	0.76%	75%
Major, severe and life threatening Pharmacist interventions (<i>Pharmacy data</i>)	31%	11.4%	63%
Patient identity medicines administration errors	15	5	66%
Insulin errors (<i>NADIA data</i>)	46.2%	4.8%	90%
No and low : Moderate harm % ratio	85% : 15%	96.5% : 3.5%	N/A

Table 34: Comparative medicine safety error data pre and post-ePMA

SOME REFLECTIONS

- It's a Journey to maximise benefits !
- Incremental change over time
- Consider ED early in Go Live
- Don't try and do everything at once
- Senior clinical buy in essential
- Not all plain sailing
 - Hardware
 - WIFI
 - Technology issues
 - Training
- Significant safety benefits delivered
 - Early and immediate
 - Ongoing
- Collect baseline data and decide what you want to monitor
- Use data already collecting and the data within the ePMA database
- Allows audit of Pharmacist / Technician activity (Model Hospital) and prioritisation of tasks