Patient Safety: What is the problem?

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The European Association of Hospital Pharmacists (EAHP) is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education
UPN 475-000-09-017-L04-P

Schedule

- 9:00 to 10:30 principles and methodology of risk management
- 11:00 to 12:30 risk analysis: tools and how to use
- 14:00 to 15:30 medication errors
- 16:00 to 18:00 workshop, presentation and discussion of results

Pharmacovigilance in the UK

Before the Medicines Act 1968, drug companies were not required to ensure that their products were safe during pregnancy.

The thalidomide disaster in Australia was a wake-up call for the pharmaceutical and medical profession, with a realisation that all drugs have the potential to cause harm as well as do good.

In 1963, The Committee on Safety of Drugs (now the Commission on Human Medicines) was established and the Medicines Control Agency [now the Medicines and Healthcare Products Regulatory Agency (MHRA)] was established to run the system of pharmacovigilance in the UK.

A fundamental truth

- Pharmacovigilance = ADR only

Discuss!

Agree? Number

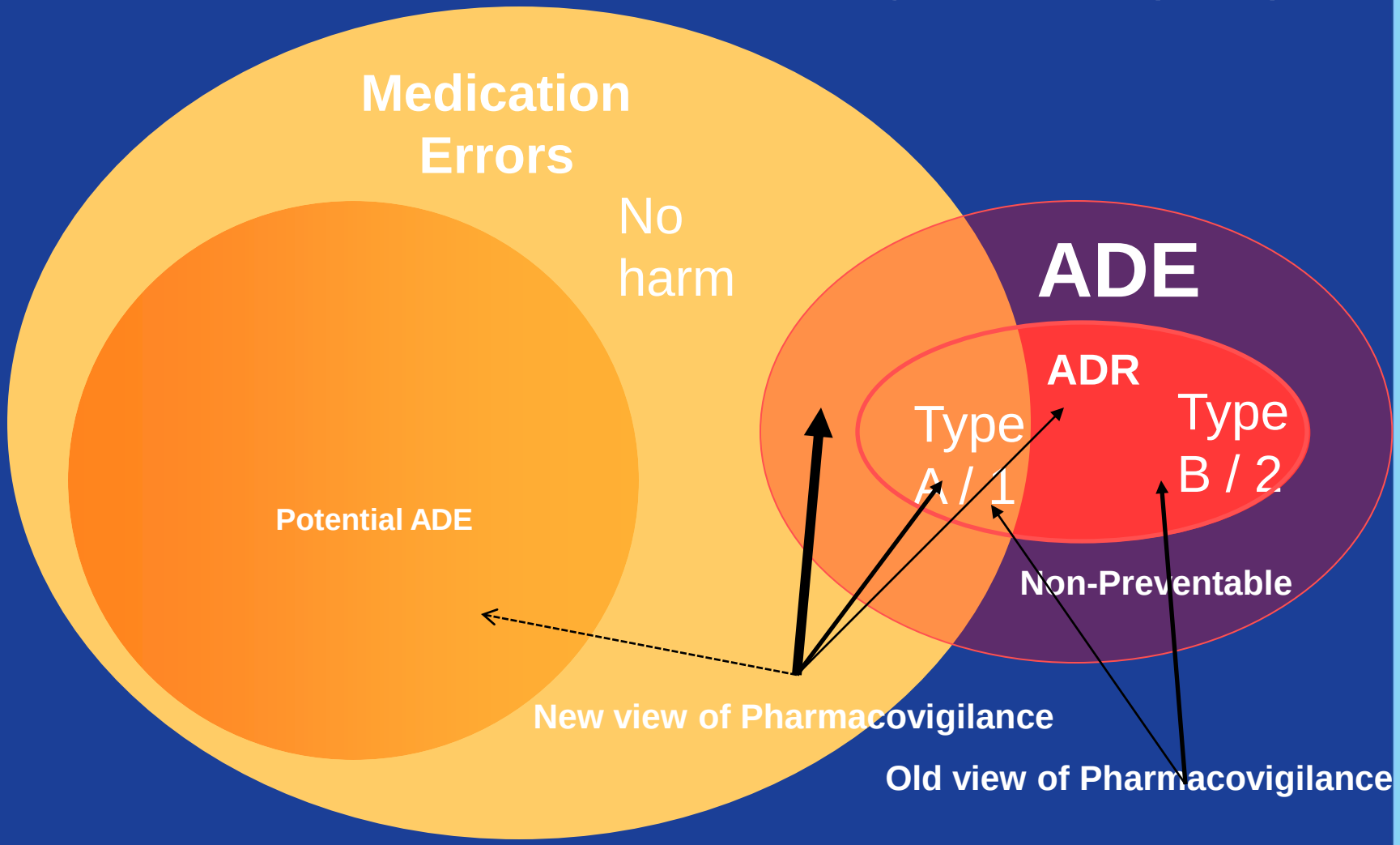
Disagree? Number

Well things are changing

- WHO
- Pharmacovigilance is annexing error –

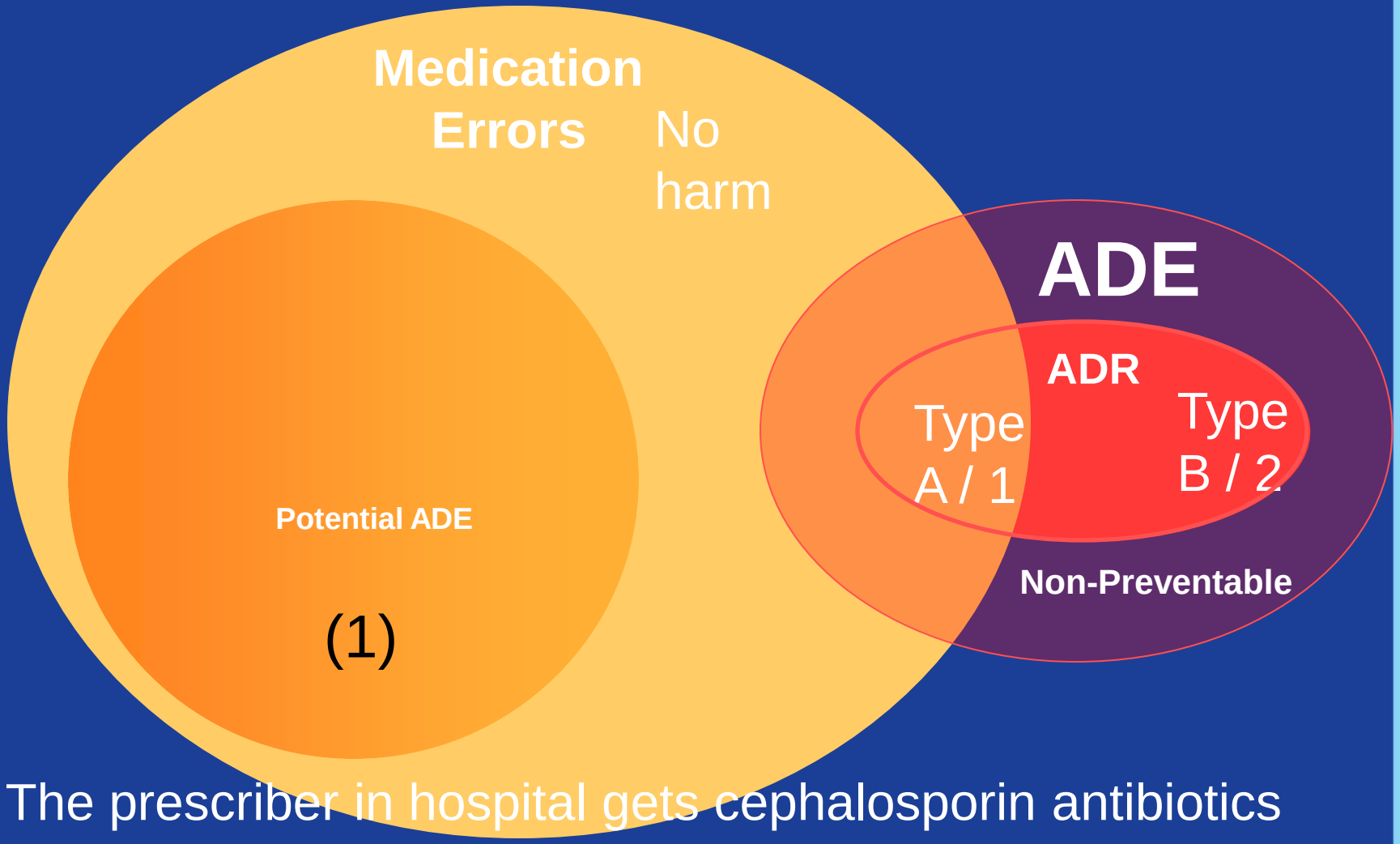
  but at the moment it is having a hard time understanding what that means

Adverse Drug Event (ADE)
Adverse Drug Reaction (ADR)



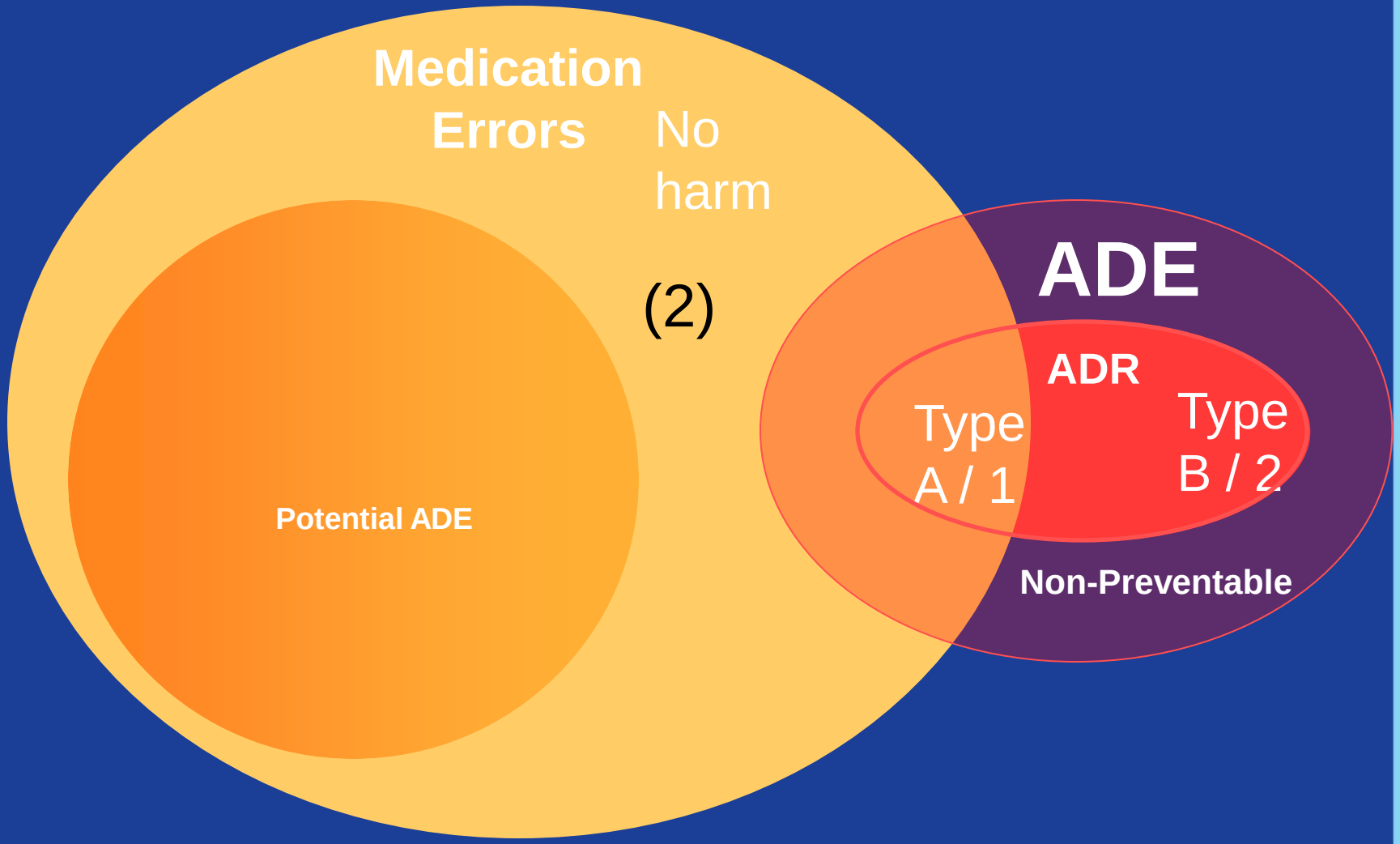
Started with: Bates DW, Leape LL, Petrycki SJ. Incidence and preventability of adverse drug events in hospitalised adults. *Gen Intern Med* 1993;8:289-94.

Consider a patient prescribed a penicillin. There are many outcomes



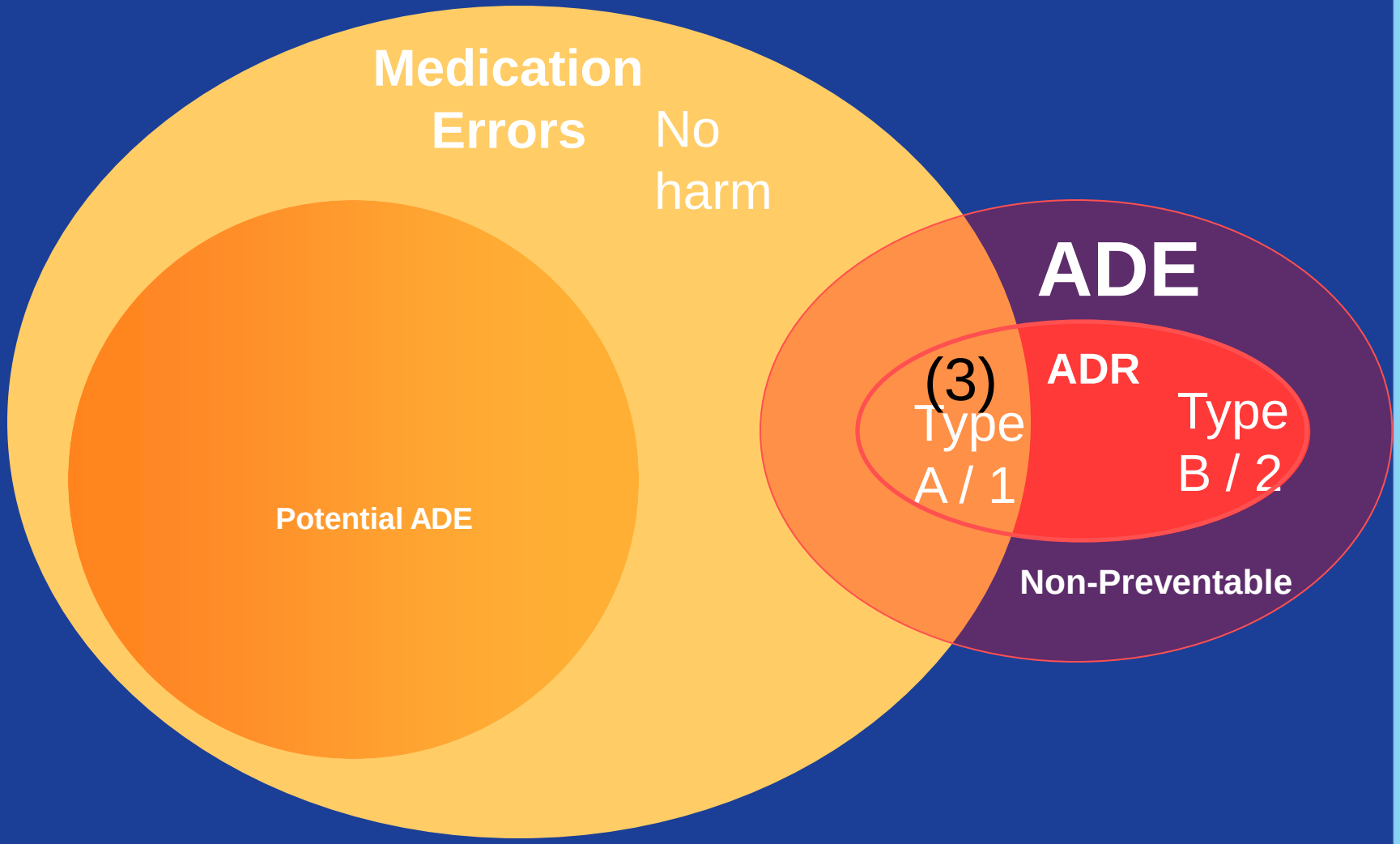
The prescriber in hospital gets cephalosporin antibiotics mixed up. The error is identified by a clinical pharmacist and the correct antibiotic is prescribed.

Consider a patient prescribed a penicillin. There are many outcomes



The patient gets given the wrong cephalosporin antibiotic but suffers no harm.

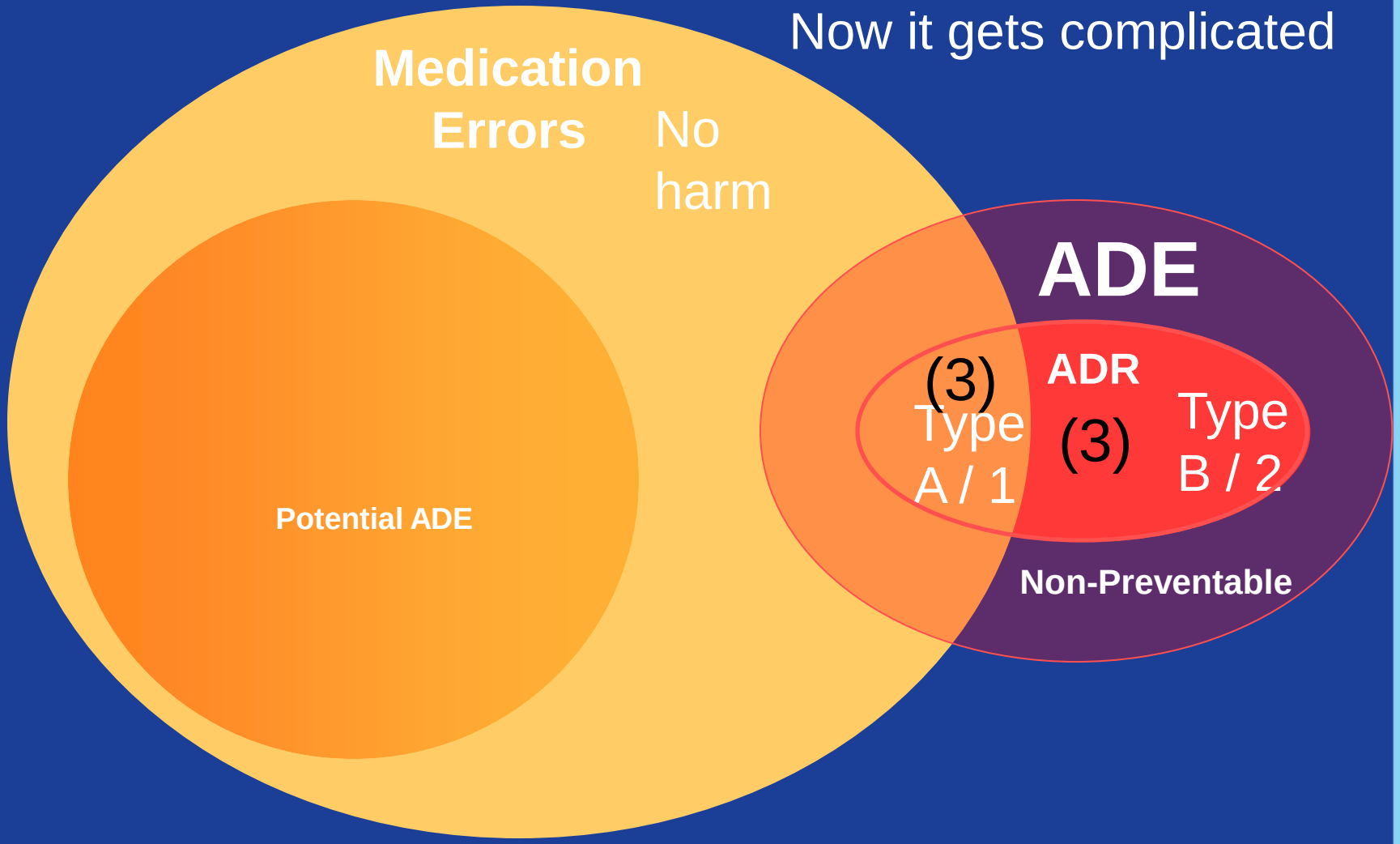
Consider a patient prescribed a penicillin. There are many outcomes



The patient gets given the wrong cephalosporin antibiotic and suffers diarrhoea.

Consider a patient prescribed a penicillin.
There are many outcomes

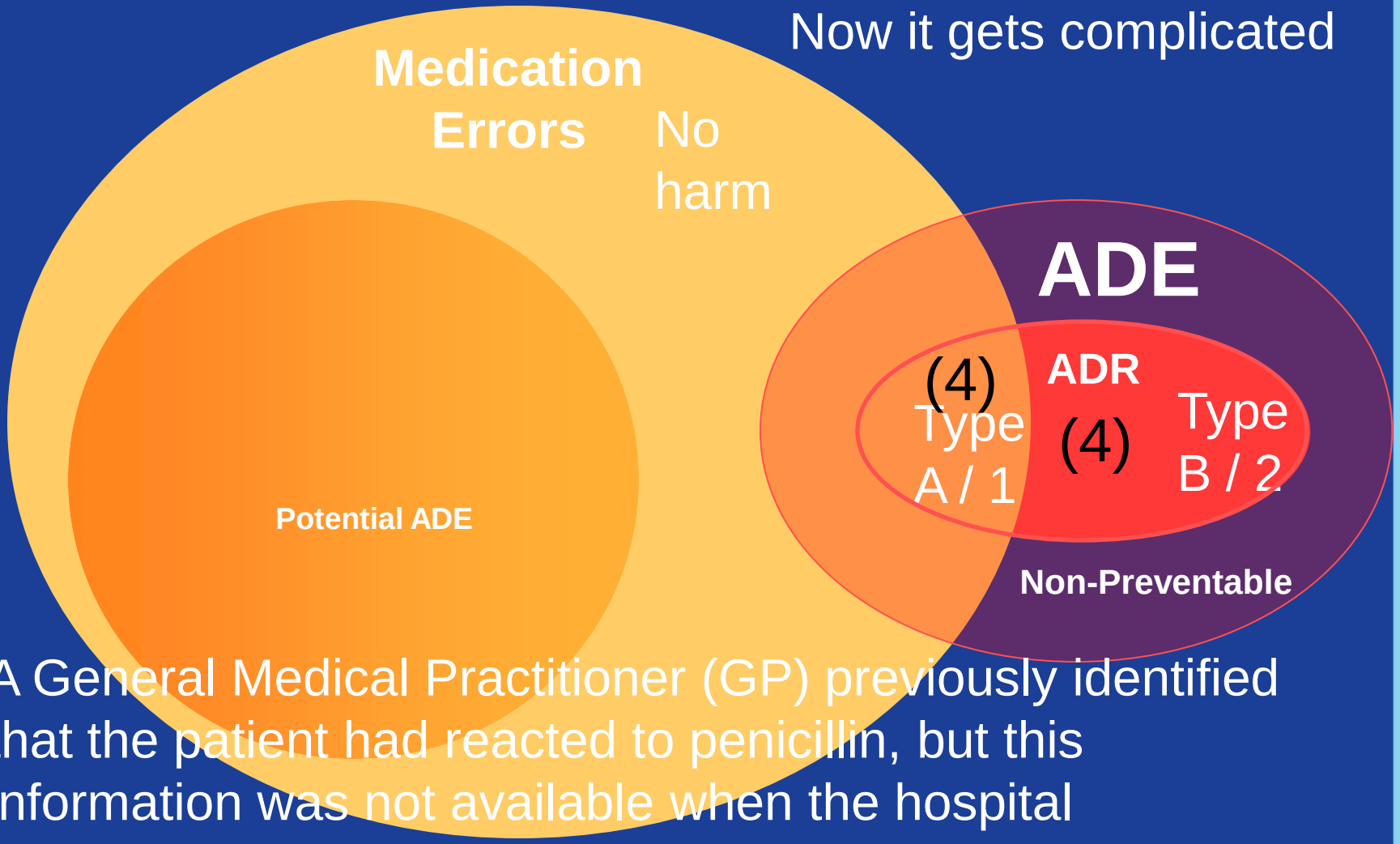
Now it gets complicated



The patient suffers an allergic reaction to the prescribed wrong cephalosporin.

Consider a patient prescribed a penicillin. There are many outcomes

Now it gets complicated



A General Medical Practitioner (GP) previously identified that the patient had reacted to penicillin, but this information was not available when the hospital prescribing decision was taken – the patient has an anaphylactic reaction and dies

Recent example

- Patient had a discharge summary written on [electronic system ES] . Patient had sickle cell disease and was precribed penicillin 250mg BD on the drug chart . The Dr selected the incorrect drug from the drop down menu on ES - penicillamine was selected in error . This was not picked up by the pharmacist dealing with the prescription and penicillamine 250mg BD was supplied on discharge. Patient is in early stages of pregnancy first trimester. The correct drug name on ES that should have been selected is phenoxymethylpeniciiin (penicillin V).

Definition of pharmacovigilence

Traditionally, pharmacovigilance is concerned with the detection, assessment and prevention of adverse reactions to drugs

Concise

http://apps.who.int/medicinedocs/en/d/Jh2934e/3.html

Definition of medication errors

” A medication error is any preventable event that may cause or lead to inappropriate medication use or patient harm, while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing; order communication; product labeling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use."

Waffle

http://www.nccmerp.org/aboutMedErrors.html

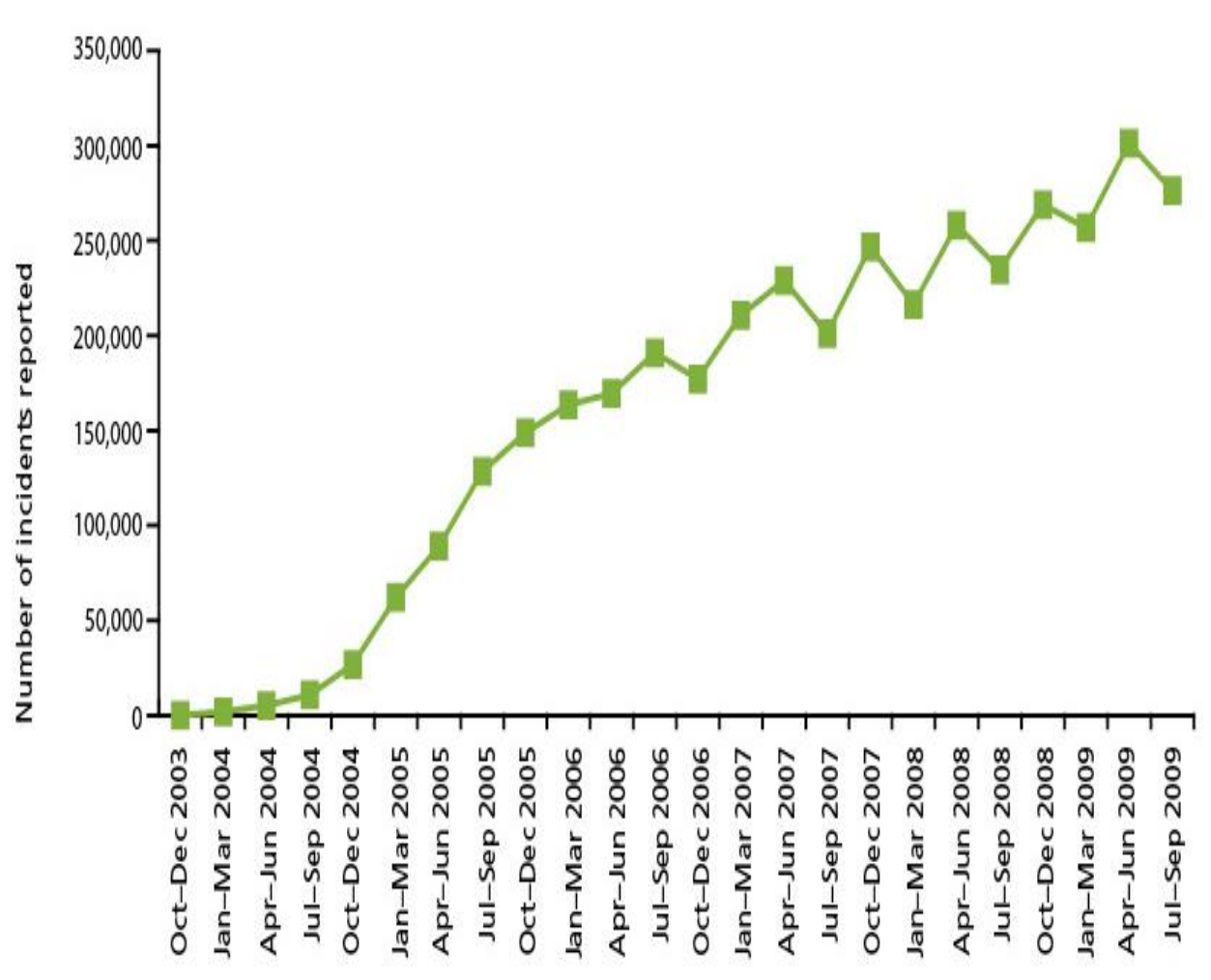
Key Reference - Council of Europe, Creation of a better medication safety culture in Europe. Building up safe medication practices.2006.

http://www.coe.int/t/e/social_cohesion/soc-sp/medication%20safety%20culture%20report%20e.pdf

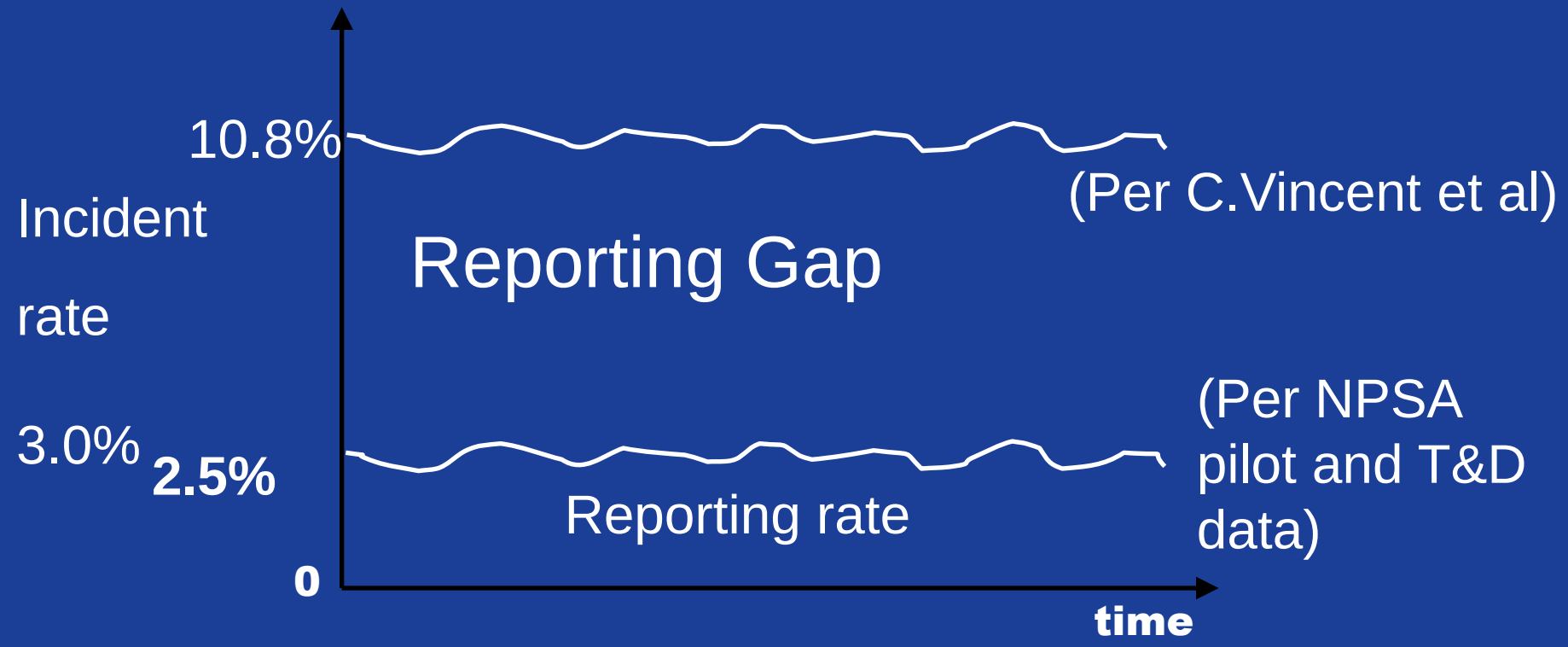
So you really need a good handle on what is medication error

- The extent of error
- What you can do to minimise errors

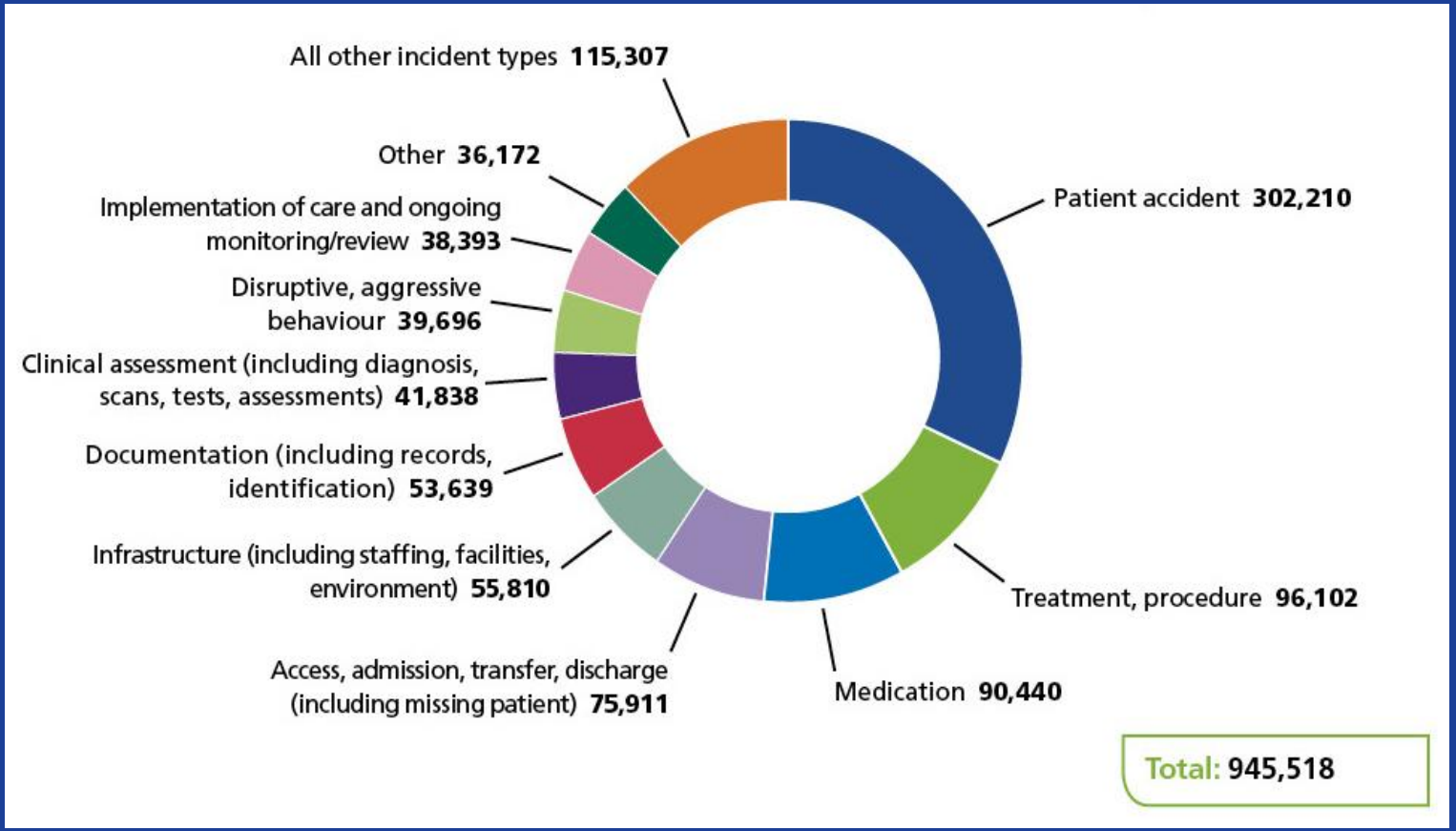
Number of incidents reported in England, October 2003 to September 2009



The reporting gap identified

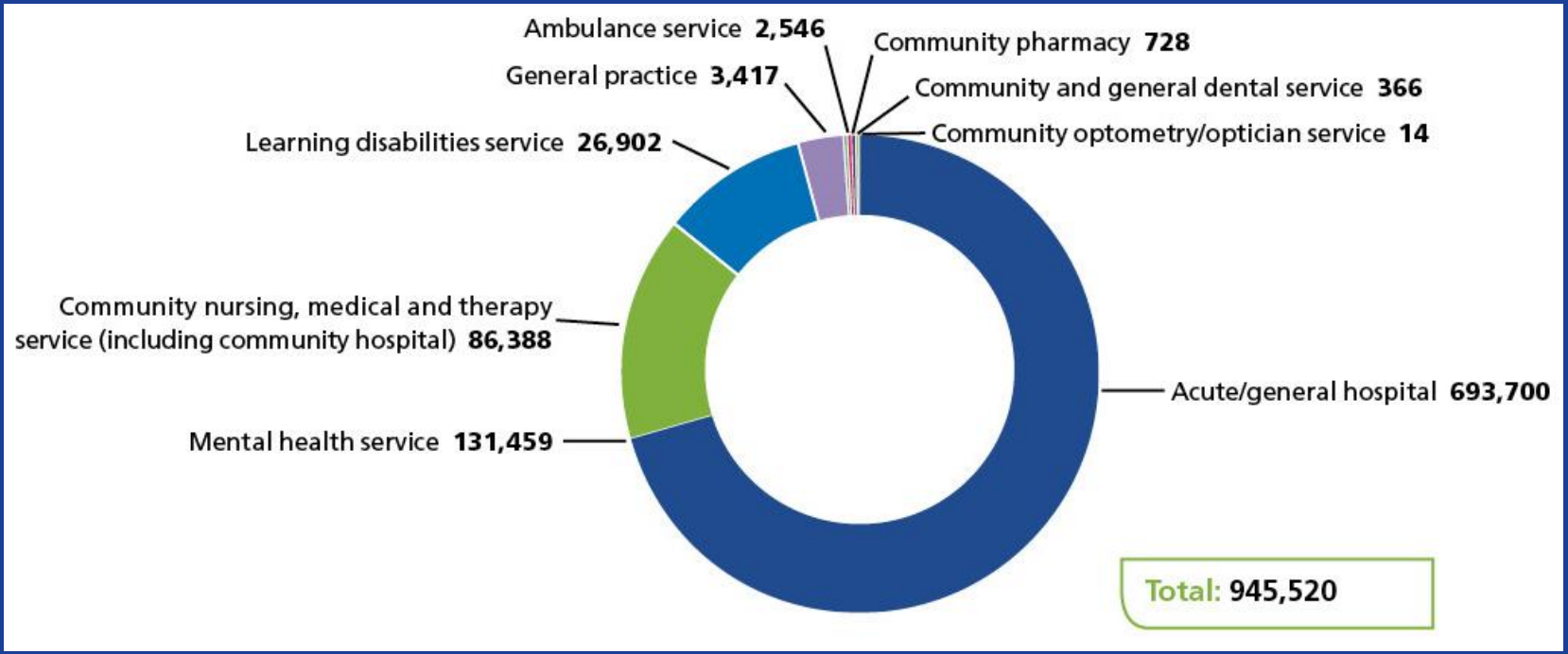


Reported incident types in England, July 2008 to June 2009

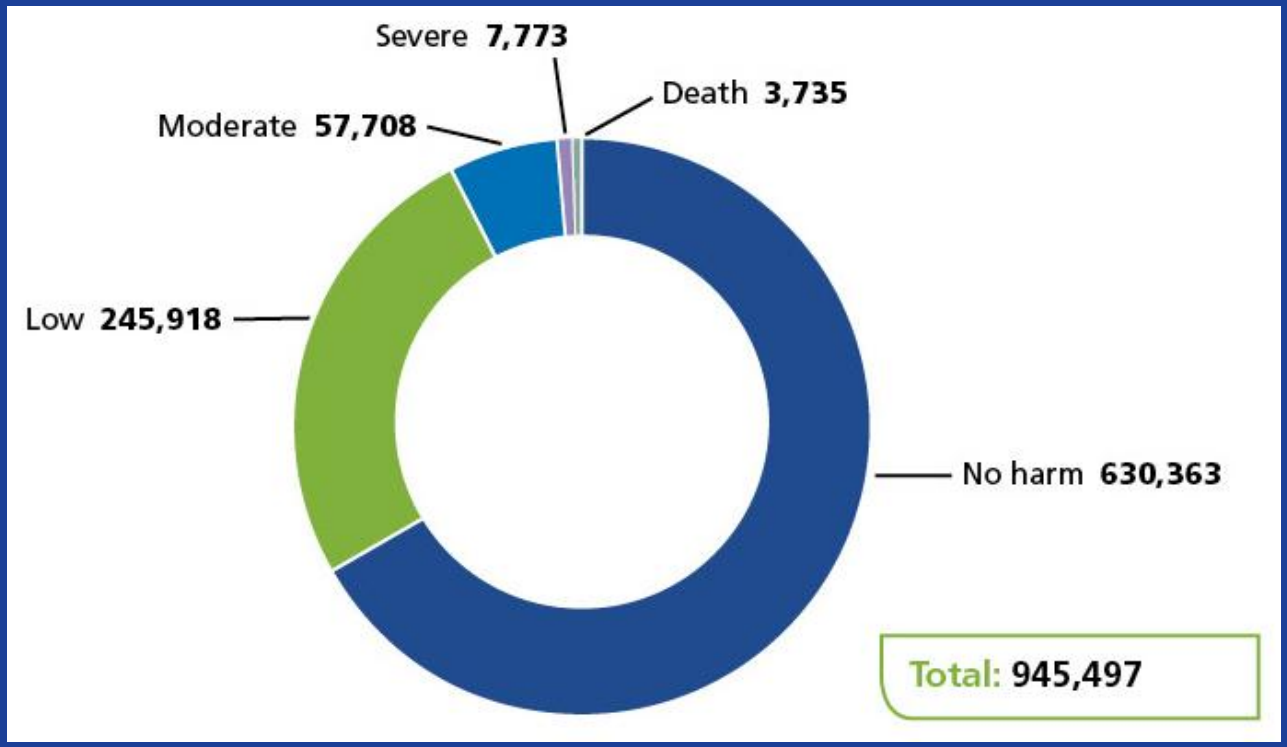


The total figures in England are marginally lower than those shown in other tables, as there were two incidents with missing incident type. These incidents are currently being investigated.

Care setting of incident reports in England, July 2008 to June 2009



Reported degree of harm to patients in England, July 2008 to June 2009



Total excludes incidents for which degree of harm was not available, thus total may differ from other figures.


Imagine you are watching this....
With your camera!


MICHAEL LONG
TRUCK & CRANE HIRE


MICHAEL LOUGH

What are the lessons here!

- If you don’t learn you are doomed to repeat the mistake
- Bigger is not necessarily better – smarter is more useful
- Need to scope and understand the problem

Medication incidents reported to the NRLS

Table 1

Time period	Number of medication incidents reported to the RLS
Jan 2005 to Dec 2005	36,335
Jan 2006 to Dec 2006	64,678
Jan 2007 to Dec 2007	86,085

Table 4 Types of reported patient safety incidents for England and Wales, 2007		
Types of patient safety incidents	**Number of incidents**	**Percentage**
Patient accident	279,858	34
Treatment/procedure	75,875	9
Medication	72,482	9
Access, admission, transfer, discharge (including missing patient)	60,694	7
Infrastructure (including staffing, facilities, environment)	52,096	6
All other types of incident	270,741	33
Total	**811,746**	**100**

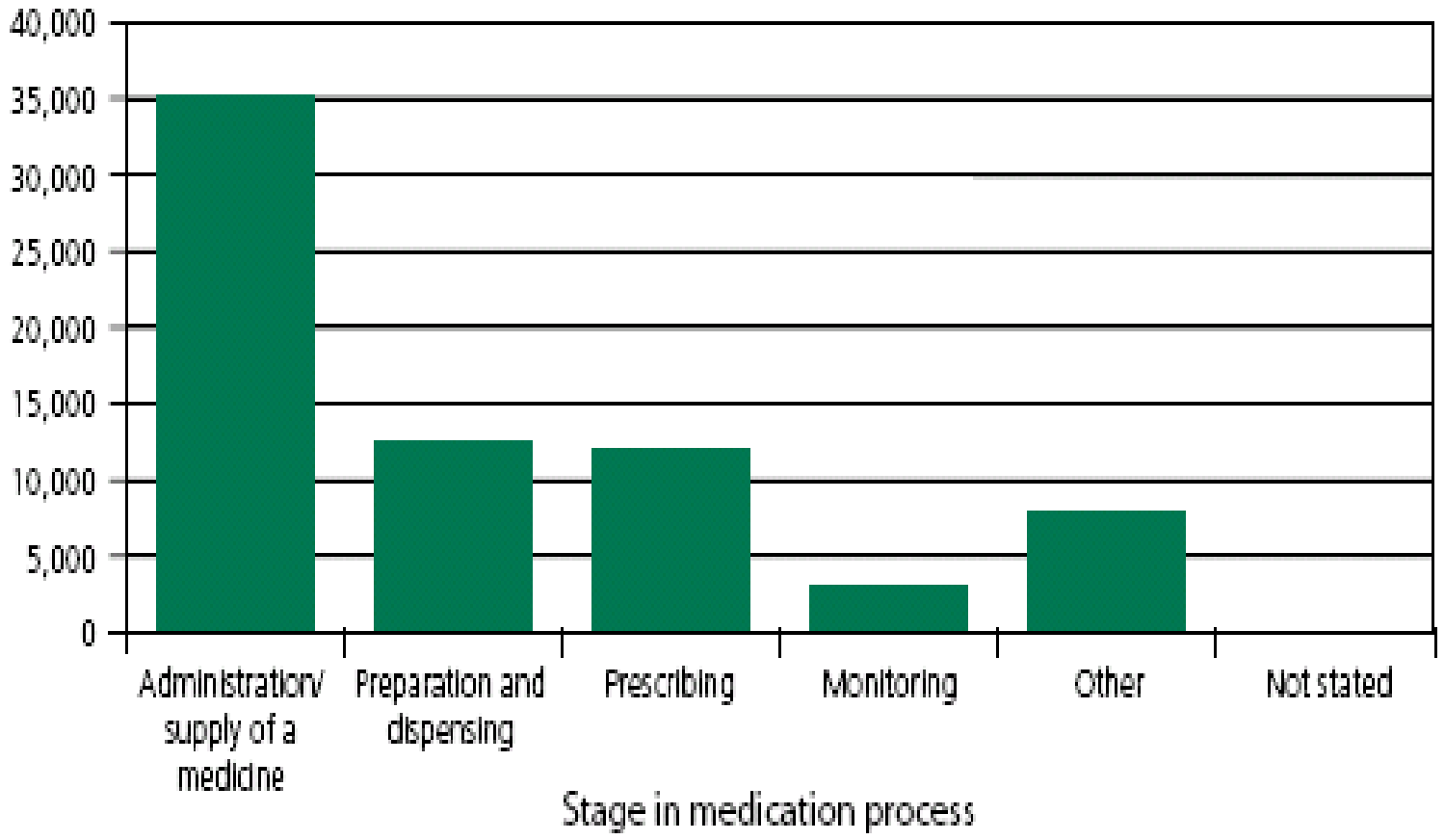
Table 7 Medication incidents by clinical outcome, 2007

Clinical outcome	Incidents	Percentage
No harm	58,326	80
Low harm	11,338	16
Moderate harm	2,710	4
Severe harm (following review)	63	<1
Death (following review)	37	<1
Other*	8	<1
Total	**72,482**	**100**

Table 5 Medication incidents by care setting, 2007

Care setting	Incidents	Percentage
Acute hospitals	54,827	76
Mental health service	6,551	9
Community nursing, medical and therapy service (including community hospitals)	5,563	8
Community pharmacy	3,521	5
Learning disabilities service	1,183	2
General practice	738	1
Ambulance service	86	<1
Community and general dental service	12	<1
Community optometry/ optician service	1	<1
Total	**72,482**	**100**

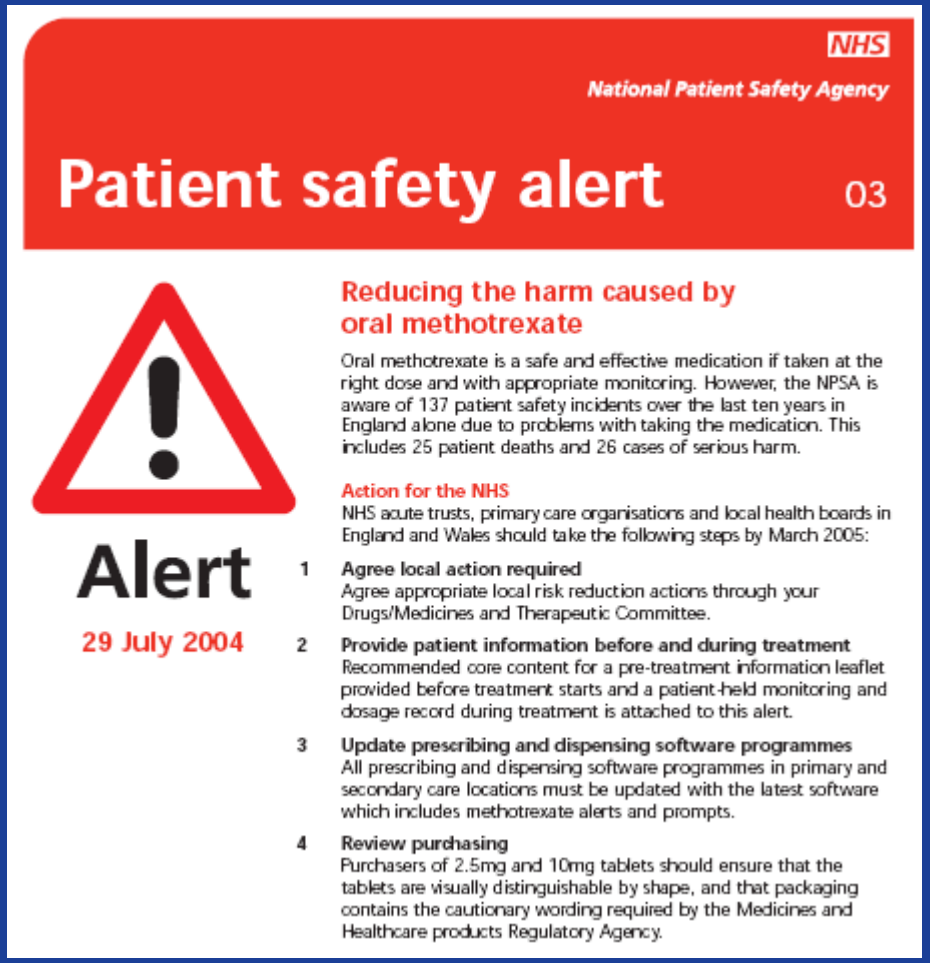
Chart 1 Medication Inddents by stage of medication process – all care settings, 2007



Patient Safety Observatory Reports	Patient Safety Alerts/Notices	Rapid Response Reports	Design for Patient Safety Report
• 3 x Safety in doses: Improving the Use of Medicines in the NHS	• Potassium chloride concentrated solutions	• Risk of confusion between non-lipid and lipid formulations of cytarabine	• A guide to the graphic design of medication packaging
	• Methotrexate	• Risk of confusion between non-lipid and lipid formulations of injectable amphotericin	• Labelling and packaging of injectable medicines
	• Ensuring safer practice with repevax and revaxis vaccines	• Fire hazard with paraffin based skin products on dressings and clothing	• The dispensing environment
	• Improving compliance with oral methotrexate guidelines	• Risks of incorrect dosing of oral anti-cancer medicines	• Dispensed medicines
	• NPSA alerts NHS to risks with high dose morphine and diamorphine injections	• Risks with intravenous heparin flush solutions	• Guidelines for safe on-screen display of medication information
	• Actions that can make anticoagulant therapy safer	• Reducing dosing errors with opioid medicines	• Infusion devices (in preparation)
	• Promoting safer use of injectable medicines	• Problems with infusions and sampling from arterial lines	• Single use medication devices (in preparation)
	• Promoting the safe measurement and administration of liquid medicines via oral and other enteral routes	• Using vinca alkaloid minibags (adult/adolescent units)	
	• Safer practice with epidural injections and infusions	• Risks of omitting Hib when administering Infanrix-IPV+Hib	
	• Reducing the risk of hyponatraemia when administering intravenous fluids to children	• Reducing risk of overdose with midazolam injection in adults	
	• Safer spinal (intrathecal) epidural and regional devices Part A	• Reducing risk of harm from bowel cleansing solutions	
	• Safer spinal (intrathecal) epidural and regional devices Part B	• Reducing harm from omitted and delayed medicines in hospital	
	• Safer lithium therapy		

Patient Safety Alerts/Notices

- Potassium chloride concentrated solutions
- Methotrexate
- Ensuring safer practice with repevax and revaxis vaccines
- Improving compliance with oral methotrexate guidelines
- NPSA alerts NHS to risks with high dose morphine and diamorphine injections
- Actions that can make anticoagulant therapy safer
- Promoting safer use of injectable medicines
- Promoting the safe measurement and administration of liquid medicines via oral and other enteral routes
- Safer practice with epidural injections and infusions
- Reducing the risk of hyponatraemia when administering intravenous fluids to children
- Safer spinal (intrathecal) epidural and regional devices Part A
- Safer spinal (intrathecal) epidural and regional devices Part B
- Safer lithium therapy
- Spinal connections
- Insulin passport



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Patient safety alert 03

Alert

29 July 2004

Reducing the harm caused by oral methotrexate

Oral methotrexate is a safe and effective medication if taken at the right dose and with appropriate monitoring. However, the NPSA is aware of 137 patient safety incidents over the last ten years in England alone due to problems with taking the medication. This includes 25 patient deaths and 26 cases of serious harm.

Action for the NHS

NHS acute trusts, primary care organisations and local health boards in England and Wales should take the following steps by March 2005:

1 **Agree local action required**
Agree appropriate local risk reduction actions through your Drugs/Medicines and Therapeutic Committee.

2 **Provide patient information before and during treatment**
Recommended core content for a pre-treatment information leaflet provided before treatment starts and a patient-held monitoring and dosage record during treatment is attached to this alert.

3 **Update prescribing and dispensing software programmes**
All prescribing and dispensing software programmes in primary and secondary care locations must be updated with the latest software which includes methotrexate alerts and prompts.

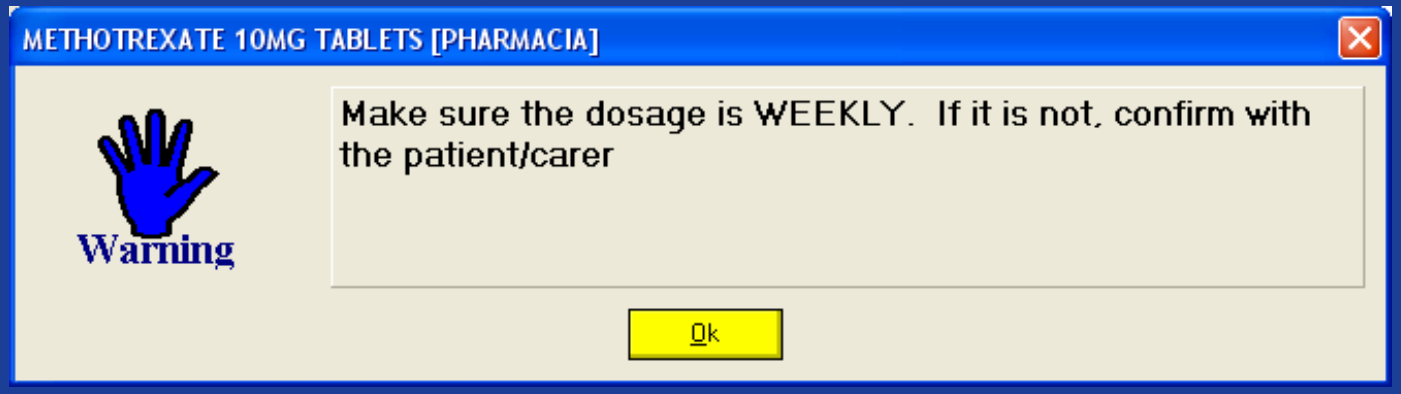
4 **Review purchasing**
Purchasers of 2.5mg and 10mg tablets should ensure that the tablets are visually distinguishable by shape, and that packaging contains the cautionary wording required by the Medicines and Healthcare products Regulatory Agency.

NPSA Methotrexate

Update prescribing and dispensing software programmes

All prescribing and dispensing software programmes in primary and
secondary care locations must be updated with the latest software
which includes methotrexate alerts and prompts.


:: This is a NPSA High Risk Process Caution!
Methotrexate is usually prescribed weekly and requires regular monitoring and blood tests.
Do not proceed
Proceed


METHOTREXATE 10MG TABLETS [PHARMACIA]
Warning
Make sure the dosage is WEEKLY. If it is not, confirm with the patient/carer
Ok

Alert

Patient Safety Alert

NPSA/2009/PSA005
1 December 2009

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National Reporting and Learning Service

Safer lithium therapy

Issue

Some patients taking lithium have been harmed because they have not had their dosage adjusted based on recommended regular blood tests. If patients are not informed of the known side effects or symptoms of toxicity, they cannot manage their lithium therapy safely.

Regular blood tests are important. Clinically significant alterations in lithium blood levels occur with commonly prescribed and over-the-counter medicines. The blood level of lithium is dependent on kidney function and lithium has the potential to interfere with kidney (renal) and thyroid functions.

Patient safety incidents

The National Patient Safety Agency (NPSA) received 567 incident reports (October 2003 to December 2008) relating to lithium use. Two reports were of severe harm, 34 moderate and 531 low or no harm. The most common error was 'wrong or unclear dose or strength' (124 incidents).

The NHS Litigation Authority dealt with two fatal and 12 severe harm

Action by all organisations in the NHS and independent sector

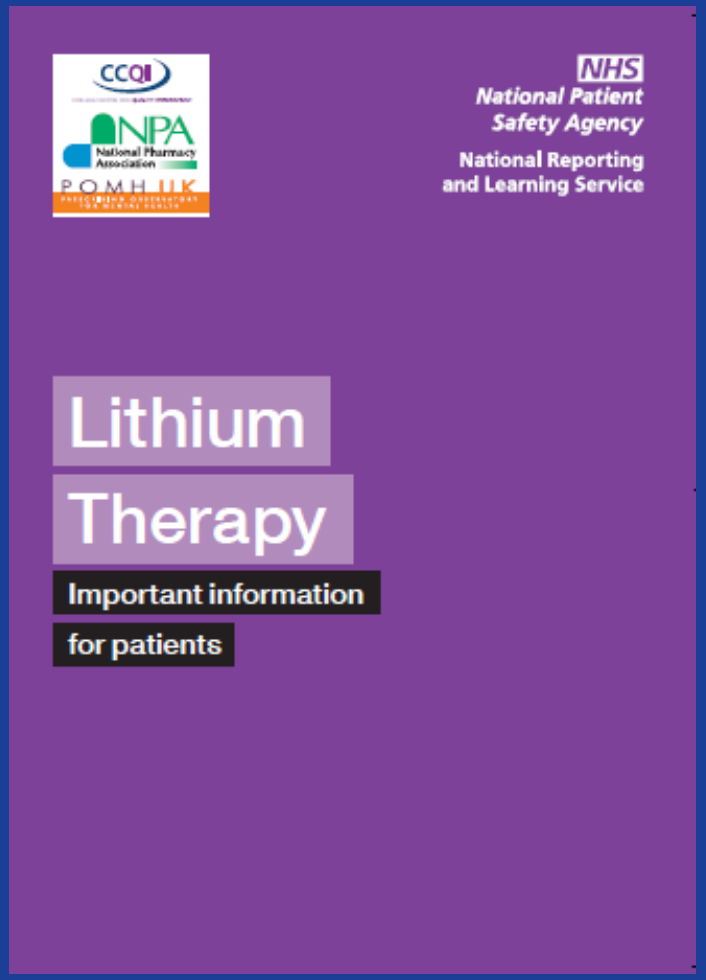
Action for all organisations in the NHS and independent sector where lithium therapy is initiated, prescribed, dispensed and monitored.

An executive director, nominated by the chief executive, working with relevant medical, nursing and pharmacy staff and the lead biochemist providing services to the trust, should ensure that **by 31 December 2010:**

1. patients prescribed lithium are monitored in accordance with NICE guidance;

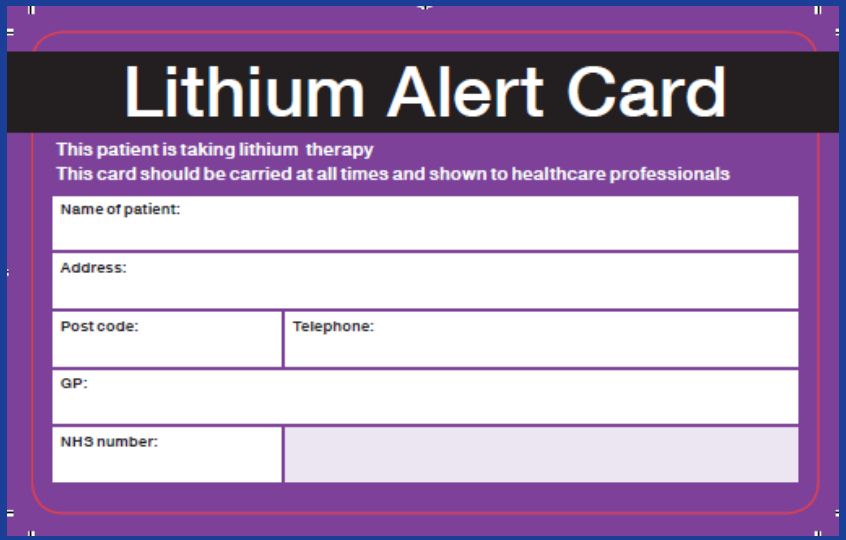
The Lithium Booklet

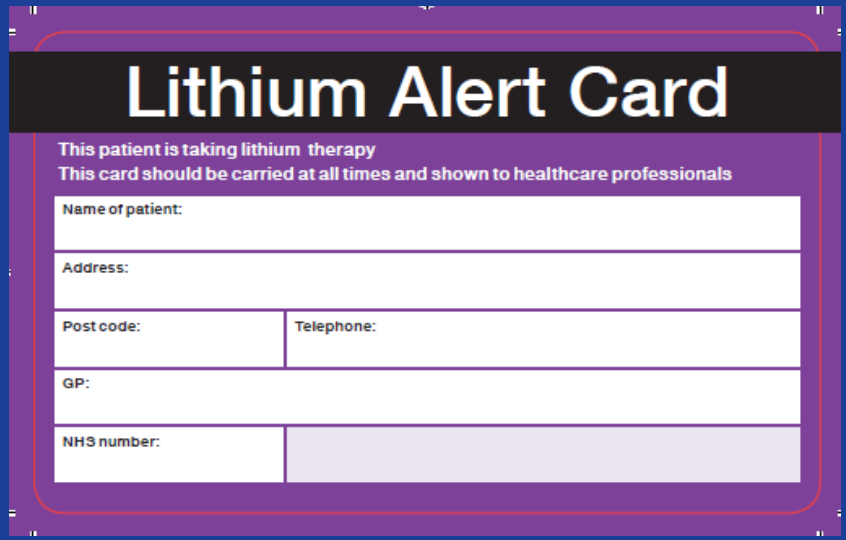
This is a 24 page booklet with spaces for details of the patient, supporting health provider services and his/her current drug therapy. It provides information each patient must know and understand in order to make lithium therapy safe.



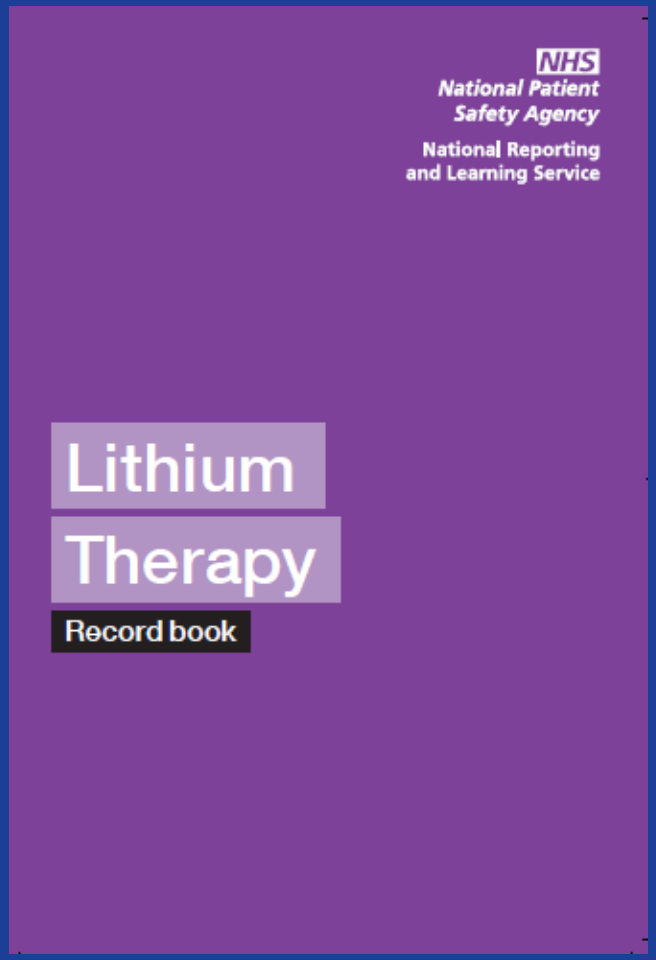
The Lithium Alert Card

This is the size of a credit card. It should be carried by the patient at all times. It informs healthcare professionals that the patient is taking a specific brand of lithium and provides details of contacts in an emergency.





The Lithium Record Book



Lithium blood level (mmol/L) should not be above:		Test results
Date of the next blood level and checks	Date of current blood level and checks	Lithium blood level (mmol/L)

Test results

Test results		
Kidney checks (GFR / e-GFR)	Thyroid checks (TFTs)	Weight / BMI

Rapid Response Reports

- Risk of confusion between non-lipid and lipid formulations of cytarabine
- Risk of confusion between non-lipid and lipid formulations of injectable amphotericin
- Fire hazard with paraffin based skin products on dressings and clothing
- Risks of incorrect dosing of oral anti-cancer medicines
- Risks with intravenous heparin flush solutions
- Reducing dosing errors with opioid medicines
- Problems with infusions and sampling from arterial lines
- Using vinca alkaloid minibags (adult/adolescent units)
- Risks of omitting Hib when administering Infanrix-IPV+Hib
- Reducing risk of overdose with midazolam injection in adults
- Reducing risk of harm from bowel cleansing solutions
- Reducing harm from omitted and delayed medicines in hospital
- Safer use of insulin

NHS
National Patient Safety Agency

Rapid Response Report

NPSA/2008/RRR05

From reporting to learning 04 July 2008

Reducing Dosing Errors with Opioid Medicines

Issue
Incidents have been reported to the National Reporting and Learning System (NRLS) concerning patients receiving unsafe doses of opioid medicines, where a dose or formulation was incorrect, based on the patient's previous opioid dose. Every member of the team has a responsibility to check that the intended dose is safe for the individual patient. Knowledge of previous opioid dose is essential for the safe use of these products. There is a wide variety of opioid medicines, and supply shortages may result in products being used which are unfamiliar to practitioners.

Evidence of harm
The NPSA received reports of five deaths and over 4,2
medicines up to June 2008.

Scope of Guidance
This guidance applies when the following opioid medic
diamorphine, dipipanone, fentanyl, hydromorphone, m
pethidine.

For IMMEDIATE ACTION b
Deadline for ACTION

**This guidance is applicable to all healthcare profe
medicines to NHS patients. All relevant healthcare
this guidance, including independent contractors
by The Chief Pharmacist or Pharmaceutical Advis
Director and Clinical Governance/Risk Manager (o**

Action
When opioid medicines are prescribed, dispensed or a
healthcare practitioner concerned, or their clinical sup

- Confirm any recent opioid dose, formulation, frequ
prescribed for the patient. This may be done for ex
(although not in the case of treatment for addiction
- Ensure where a dose increase is intended, that the
oxycodone in adult patients, not **normally** more th
- Ensure they are familiar with the following characte
frequency of administration, standard dosing increr

Healthcare organisations should ensure local medicin
Procedures, are reviewed to reflect this guidance.

While dose increments should be in line with this guida
doses may be required. These recommendations are n
ensure they are used in a way that is as safe as possib

Related Guidance
In May 2006 the NPSA issued Safer Practice Notice (S
diamorphine and morphine', which aimed to ensure tha
selected. The actions in this Rapid Response Report c
to reduce errors due to a lack of understanding of how
previous doses resulting in mismatching the needs of the patient with the dose prescribed.

Further information
Supporting information on this Rapid Response Report: http://www.npsa.nhs.uk/patientsafety/alerts-and-directives/rapidrr/
Further queries to Bruce Warner - Senior Pharmacist, c/o rrr@npsa.nhs.uk; Telephone 020 7927 9890.

NPSA has informed
NHS Organisations, the Independent Sector, commissioners, regulators and relevant professional bodies in England and Wales.

Gateway Reference: 10157

For IMMEDIATE ACTION by the NHS and the independent sector.
Deadline for ACTION COMPLETE is 30 January 2009.

This guidance is applicable to all healthcare professionals prescribing, dispensing or administering opioid medicines to NHS patients. All relevant healthcare professionals and organisations should be made aware of this guidance, including independent contractors and Out of Hours providers. Actions should be co-ordinated by The Chief Pharmacist or Pharmaceutical Advisor supported by the Chief Executive, Medical Director, Nursing Director and Clinical Governance/Risk Manager (or their equivalents).

Action
When opioid medicines are prescribed, dispensed or administered, in anything other than acute emergencies, the healthcare practitioner concerned, or their clinical supervisor, should:

- Confirm any recent opioid dose, formulation, frequency of administration and any other analgesic medicines prescribed for the patient. This may be done for example through discussion with the patient or their representative (although not in the case of treatment for addiction), the prescriber or through medication records.
- Ensure where a dose increase is intended, that the calculated dose is safe for the patient (e.g. for oral morphine or oxycodone in adult patients, not **normally** more than 50% higher than the previous dose).
- Ensure they are familiar with the following characteristics of that medicine and formulation: usual starting dose, frequency of administration, standard dosing increments, symptoms of overdose, common side effects.

Healthcare organisations should ensure local medicines and prescribing policies, including Standard Operating Procedures, are reviewed to reflect this guidance.

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Rapid Response Report

NPSA/2010/RRR009

From reporting to learning — 24 February 2010

Reducing harm from omitted and delayed medicines in hospital

Issue

Medicine doses are often omitted or delayed in hospital for a variety of reasons. Whilst these events may not seem serious, for some critical medicines or conditions, such as patients with sepsis or those with pulmonary embolisms, delays or omissions can cause serious harm or death. Patients going into hospital with chronic conditions are particularly at risk. For example, patients with Parkinson's disease who do not receive their medicines on time may recover slowly or lose function, such as ability to walk. This has been highlighted by the Parkinson's Disease Society's 'Get it on time' campaign, which has produced resources for both patients and staff to help their medication on time.

The Productive Ward initiative from the National Health Service (NHS) Institu information on minimising interruptions and streamlining the medicines ward (NPSA)/National Institue for Health and Clinical Excellence guidance on me in omitted doses. These are useful resources, but further work is needed in t patient safety issue.

Patient safety incidents

Between September 2006 and June 2009, the NPSA received reports of 27 patient safety incidents relating to omitted or delayed medicines. Of the 95 m infectives (antibiotic and antifungals), and 23 involved anticoagulants. Wider may be much higher, as events such as these are often not reported.

Work on reducing risks with omitted and delayed critical medicines is neede recommending a staged approach, with initial actions now focused on speci with stakeholders over the next two years to sustain improvements over time

For IMMEDIATE ACTION by all organisations in the NHS and independ patient treatment. Deadline for ACTION COMPLETE is 24 February 201

An executive director, nominated by the chief executive, working with the ch medical/nursing staff should:

1. identify a list of critical medicines where timeliness of administration is c infectives, anticoagulants, insulin, resuscitation medicines and medicine medicines identified locally;
2. ensure medicine management procedures include guidance on the imp administering critical medicines, timeliness issues and what to do when
3. review and, where necessary, make changes to systems for the supply hours to minimise risks;
4. review incident reports regularly and carry out an annual audit of omitte that system improvements to reduce harm from omitted and delayed m be included in the organisation's annual medication safety report;
5. make all staff aware (by wide distribution of this RRR) that omission or on discharge from hospital, are patient safety incidents and should be reported.

Further information

Supporting information including detailed evidence of harm and compliance checklists are available at www.nrls.npsa.nhs.uk/alerts. Further queries should be directed to the NPSA medication safety team at rrr@npsa.nhs.uk; telephone 020 7927 9890.

The NPSA has informed: NHS organisations, independent sector, commissioners, regulators and relevant professional bodies in England and Wales.

Gateway ref: 13614

For IMMEDIATE ACTION by all organisations in the NHS and independent sector who admit patients for in-patient treatment. Deadline for ACTION COMPLETE is 24 February 2011.

An executive director, nominated by the chief executive, working with the chief pharmacist and relevant medical/nursing staff should:

1. identify a list of critical medicines where timeliness of administration is crucial. This list should include anti-infectives, anticoagulants, insulin, resuscitation medicines and medicines for Parkinson's disease, and other medicines identified locally;
2. ensure medicine management procedures include guidance on the importance of prescribing, supplying and administering critical medicines, timeliness issues and what to do when a medicine has been omitted or delayed;
3. review and, where necessary, make changes to systems for the supply of critical medicines within and out-of-hours to minimise risks;
4. review incident reports regularly and carry out an annual audit of omitted and delayed critical medicines. Ensure that system improvements to reduce harm from omitted and delayed medicines are made. This information should be included in the organisation's annual medication safety report;
5. make all staff aware (by wide distribution of this RRR) that omission or delay of critical medicines, for inpatients or on discharge from hospital, are patient safety incidents and should be reported.

Design for Patient Safety Report

- A guide to the graphic design of medication packaging
- Labelling and packaging of injectable medicines
- The dispensing environment
- Dispensed medicines
- Guidelines for safe on-screen display of medication information
- Infusion devices (in preparation)
- Single use medication devices (in preparation)

The Importance of Design for Patient Safety

The progenitor

https://www-edc.eng.cam.ac.uk/medical/downloads/report.pdf (accessed 2010/03/19)

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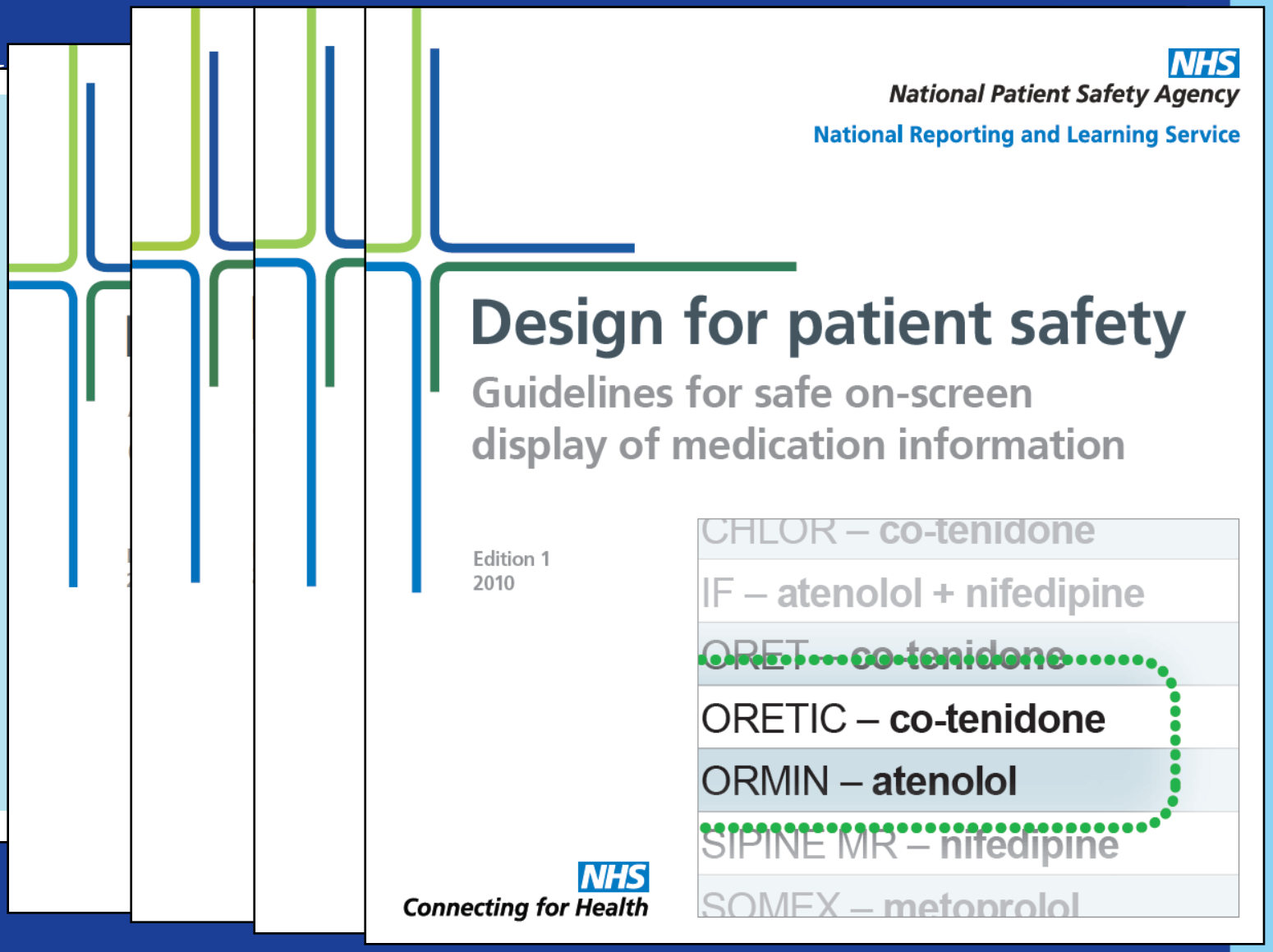
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National Patient Safety Agency
National Reporting and Learning Service
Design for patient safety
Guidelines for safe on-screen display of medication information
Edition 1
2010
CHLOR – co-tenidone
IF – atenolol + nifedipine
ORET – co-tenidone
ORETIC – co-tenidone
ORMIN – atenolol
SIPINE MR – nifedipine
SOMEX – metoprolol
NHS
Connecting for Health

3.2 Misreading or misinterpreting units of measure

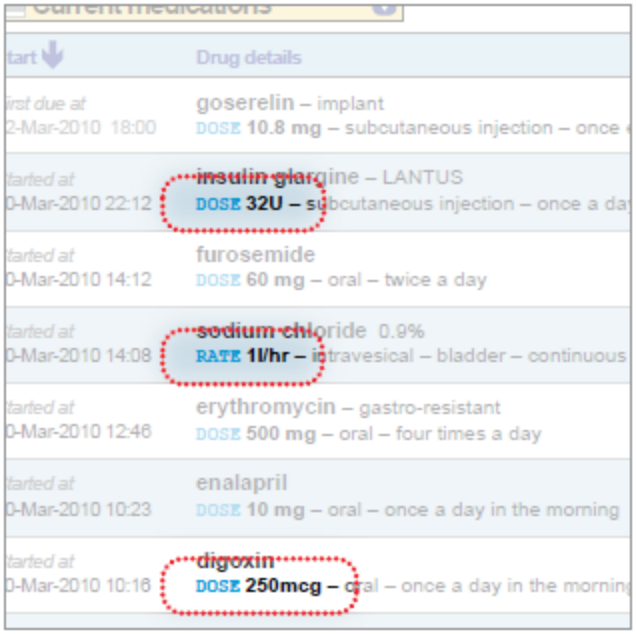
Issue

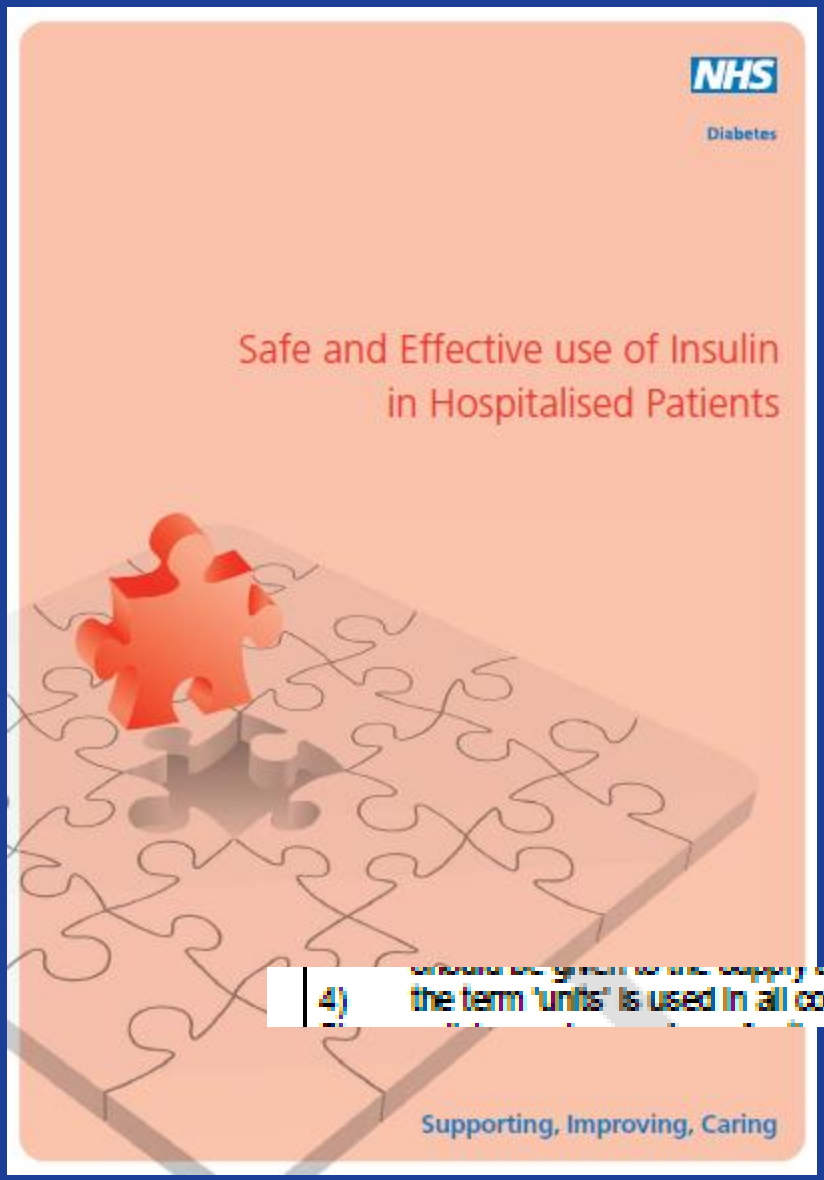
Units of measure are vital components of a prescription. If misinterpreted, the results can be fatal. IT systems can help reduce the possibility of misinterpretation by displaying only standard approved units of measure, whether written in full or abbreviated, and using these consistently at all times.

Units of measure associated with error include:

- 'U' for 'unit' being misread as the number '0';
- 'l' for 'litre' being misread as the number '1';
- 'mcg' for 'micrograms' being misread as 'mg' for 'milligrams'.

Errors are more likely when proper spacing is not used between numbers and units of measure (see pages 34 and 35).





NHS
National Patient Safety Agency

Rapid Response Report X

From Reporting To Learning XXXX 2010

Safe Administration of Insulin

Issue

Errors in the administration of insulin by clinical staff and by patients are common. They may be severe and can cause death. Two common errors have been identified.

Firstly, the use of non-insulin intravenous (IV) syringes is an error prone practice since products containing insulin are commonly presented as 100 units per ml or 50 units per 0.5 ml and IV syringes are graduated in volume not units.

Secondly, the abbreviation of units of insulin to, for example, 'U' or 'IU'. When abbreviations are written next to the intended insulin dose, the dose may be read with an extra '0' and a 10x overdose is administered in error.

Some of these errors have resulted from insufficient training in the use of insulin by healthcare professionals.

Patient Safety Incidents

The NPSA has received 3,861 wrong dose incidents involving insulin between August 2003 and August 2009. These included one death and one severe harm incident due to ten times errors from use of abbreviation of the term 'Unit'. The NPSA is also aware of three deaths and seventeen other incidents between January 2005 and July 2009 where an intravenous syringe was used to measure and administer insulin.

For IMMEDIATE ACTION by all organisations in the NHS and independent sector. The deadline date for ACTION COMPLETE is [six months after publication]

An executive director, nominated by the chief executive, working with the chief/lead pharmacist and relevant medical/nursing staff should ensure that:

1) insulin bolus doses administered from 100 unit per ml insulin products are measured and administered using 100 unit per ml or 50 unit per 0.5 ml insulin syringe or commercial insulin pen device. Intravenous syringes must never be used with 100 unit per ml insulin products;
2) all clinical areas and community staff treating diabetic patients with insulin have adequate supplies of 100 unit per ml and 50 unit per ml insulin syringes and can obtain them at all times;
3) an insulin syringe should always be used to measure the insulin dose before further dilution. Consideration should be given to the supply and use of prefilled syringes of fast acting insulin 50 units in 50ml;
4) the term 'units' is used in all contexts and that abbreviations, such as 'U', 'IU', are never used;
5) policies and procedures for the preparation and administration of insulin and insulin infusions in clinical areas are reviewed to ensure compliance with the above; and,
6) a training programme should be put in place for all healthcare staff (including medical staff) expected to prepare and administer insulin. An e-learning programme is available from www.diabetes.nhs.uk.

Further information

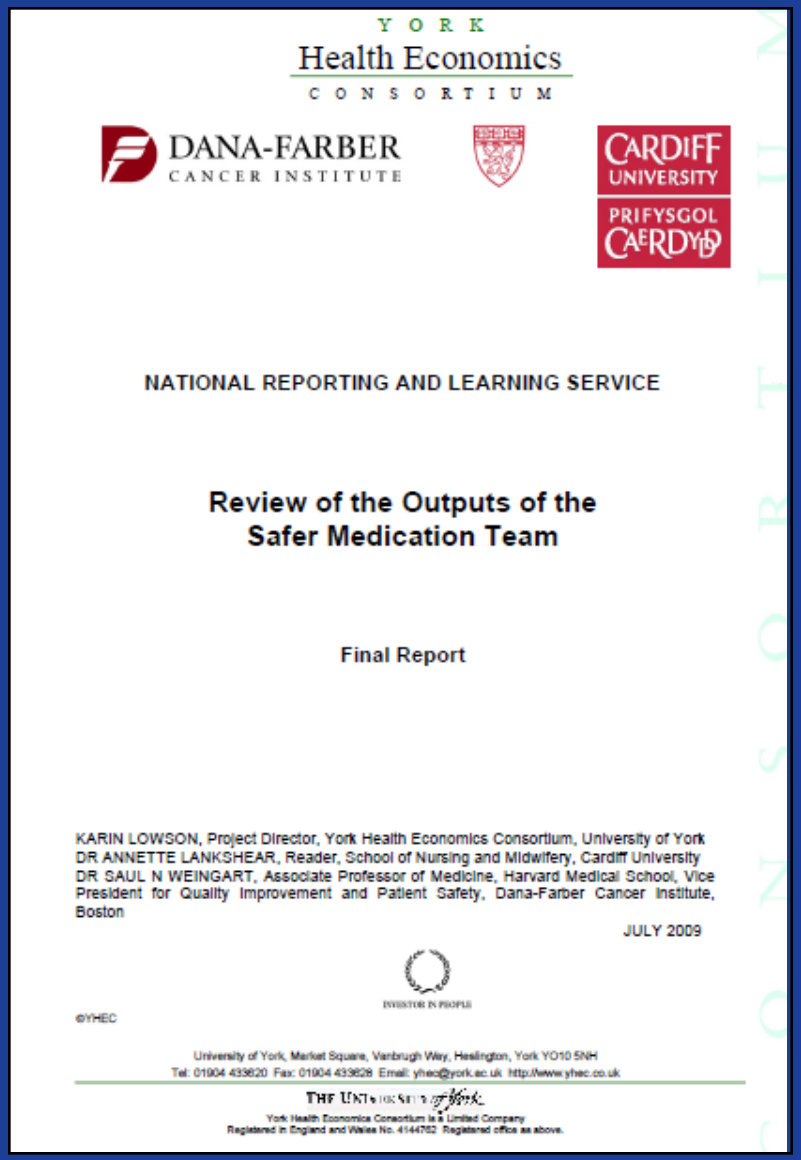
Supporting information including detailed evidence of harm, use of 500 unit per ml products and compliance checklists are available at www.nrls.npsa.nhs.uk/alerts. Further queries should be directed to the NPSA medication safety team at rrr@npsa.nhs.uk; telephone 020 7927 9690.

The NPSA has informed: NHS organisations, independent sector, commissioners, regulators and relevant professional bodies in England and Wales.

Gateway ref: XXXXX

4) the term 'units' is used in all contexts and that abbreviations, such as 'U', 'IU', are never used;

Patient Safety Observatory Reports



YORK
Health Economics
CONSORTIUM

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CANCER INSTITUTE

CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD

NATIONAL REPORTING AND LEARNING SERVICE

Review of the Outputs of the Safer Medication Team

Final Report

KARIN LOWSON, Project Director, York Health Economics Consortium, University of York
DR ANNETTE LANKSHEAR, Reader, School of Nursing and Midwifery, Cardiff University
DR SAUL N WEINGART, Associate Professor of Medicine, Harvard Medical School, Vice President for Quality Improvement and Patient Safety, Dana-Farber Cancer Institute, Boston

JULY 2009

INVESTOR IN PEOPLE

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THE UNIVERSITY OF YORK

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Awareness of...medication RRRs (May 2009)

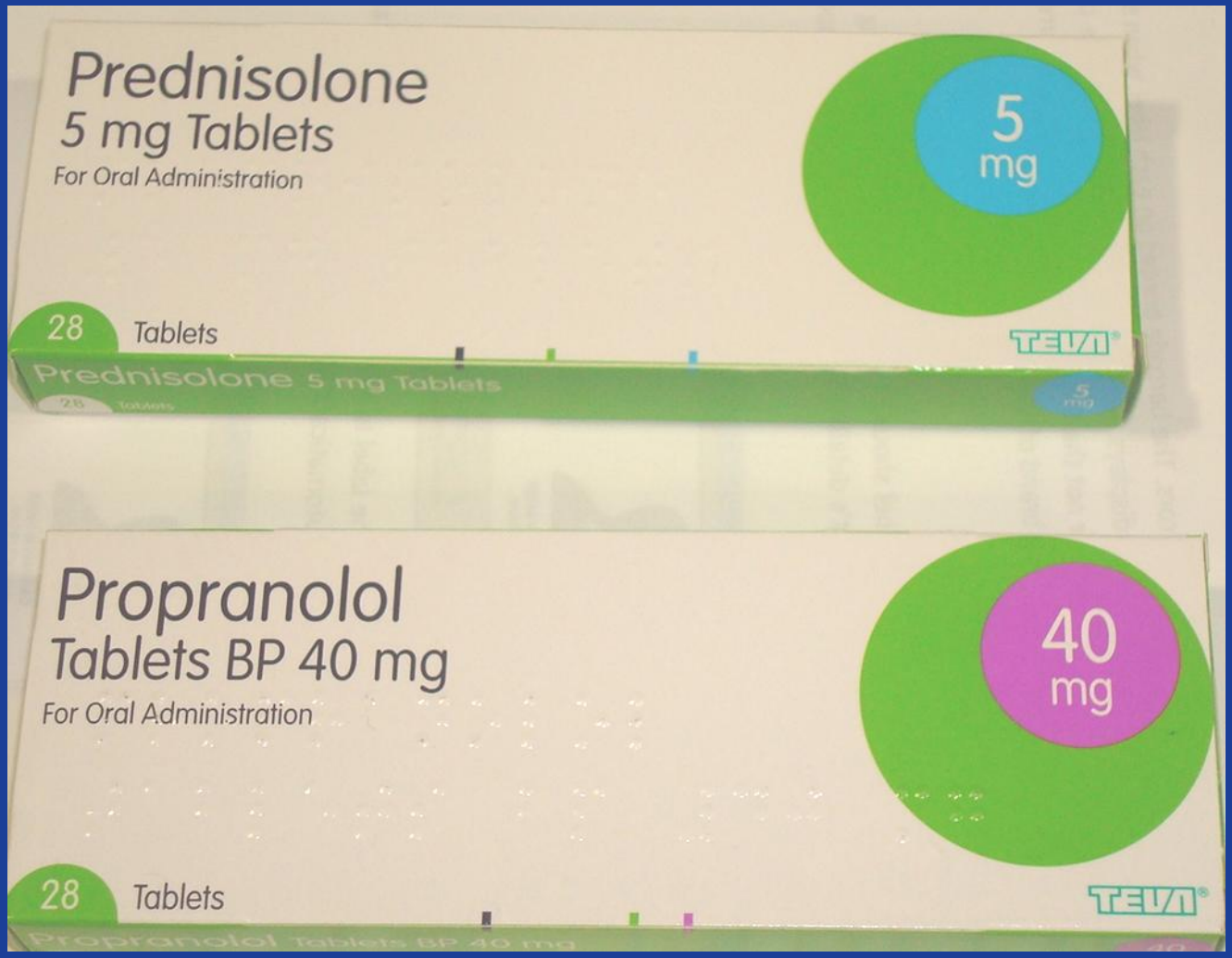
Rapid response reports (RRRS)	Medical director (n=46)	Nursing Director (n=39)	Clinical Gover-nance Directors (n=40)	Other respondents (n=38)	All Directors (n=167)
Cytarabine (2007)	20 (43.5%)	21 (53.8%)	25 (62.5%	27 (71.1%)	93 (57.1%)
Lipid and non-lipid amphotericin (2007)	22 (47.8%)	20 (51.3%)	30 (75%)	29 (76.3%)	101 (62%)
Paraffin based skin products (2007)	18 (39.1%)	28 (71.8%)	33 (82.5%)	35 (92.1%)	114 (69.9%)
Oral anti-cancer drugs (2008)	31 (67.4%)	24 (61.5%)	31 (77.5%)	36 (94.7%)	122 (74.8%)
Intravenous heparin for flushing (2008)	31 (67.4%)	33 (84.6%)	37 (92.5%)	36 (94.7%)	137 (84%)
Dosing errors in opioid medicines (2008)	33 (71.7%)	30 (76.9%)	34 (85.0%)	35 (92.1%)	132 (81%)
Problems with infusions and sampling from arterial lines (2008)	24 (52.2%)	25 (64.1%)	32 (80%)	26 (68.4%)	107 (65.6%)
Vinca alkaloid minibags (2008)	26 (56.5%)	25 (64.1%)	32 (80%)	30 (78.9%)	113 (69.3%)
Administering Infanrix-IPV+Hib (2008)	14 (30.4%)	16 (41.0%)	26 (65%)	25 (65.8%)	81 (49.7%)
Midazolam injections (2008)	27 (58.7%)	30 (76.9%)	36 (90%)	37 (97.4%)	130 (79.8%)
Mean (%)	53.5%	64.6%	79.0%	83.2%	67.7%

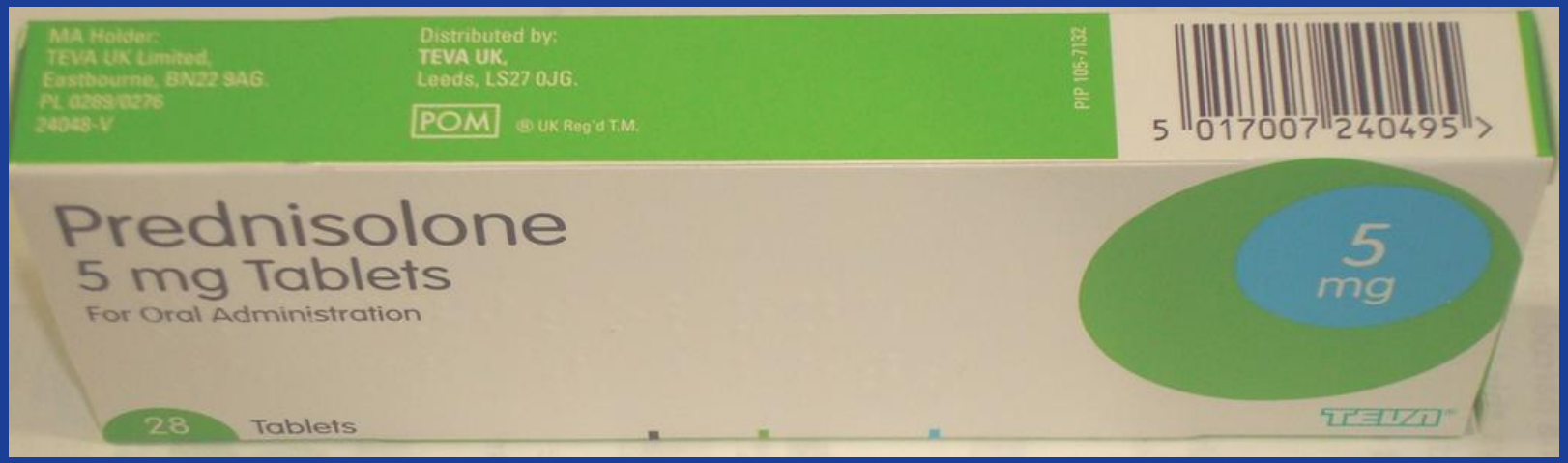
of....Patient Safety Alerts and Safer Practice Notices (May 2009)

Alerts/Safety Practice Notices	Medical director (n=46)	Nursing Director (n=39)	Clinical Governance Directors (n=40)	Other respondents (n=38)	All Directors (n=167)
Potassium chloride (2002)	25 (54.3%)	36 (92.3%)	33 (82.5%)	36 (94.7%)	130 (79.8%)
Methotrexate (2004)	27 (58.7%)	32 (82.1%)	33 (82.5%)	35 (92.1%)	127 (77.9%)
Repevax and revaxis vaccines (2005)	10 (21.7%)	20 (51.3%)	25 (62.5%)	26 (68.4%)	81 (49.7%)
Improving compliance with methotrexate guidelines	22 (47.8%)	30 (76.9%)	34 (85%)	35 (92.1%)	121 (74.2%)
High dose morphine and diamorphine (2006)	28 (60.9%)	34 (87.2%)	33 (82.5%)	36 (94.7%)	131 (80.4%)
Anticoagulants (2007)	31 (67.4%)	36 (92.3%)	39 (97.5%)	37 (97.4%)	143 (87.7%)
Safer use of injectable medicines (2007)	28 (60.9%)	34 (87.2%)	37 (92.5%)	36 (94.7%)	135 (82.8%)
Liquid medicines via oral and enteral routes (2007)	27 (58.7%)	32 (82.1%)	34 (85.0%)	37 (97.4%)	130 (79.8%)
Epidural injections and infusions (2007)	24 (52.2%)	35 (89.7%)	35 (87.5%)	36 (94.7%)	130 (79.8%)
Intravenous fluids to children (2007)	22 (47.8%)	28 (71.8%)	31 (77.5%)	31 (81.6%)	112 (68.7%)
Mean (%)	**53.0%**	**81.3%**	**83.5%**	**90.8%**	**74.3%**

Mistakes happen!

Barcoding


Prednisolone
5 mg Tablets
For Oral Administration
5
mg
28
Tablets
TEVA
Prednisolone 5 mg Tablets
Propranolol
Tablets BP 40 mg
For Oral Administration
40
mg
28
Tablets
TEVA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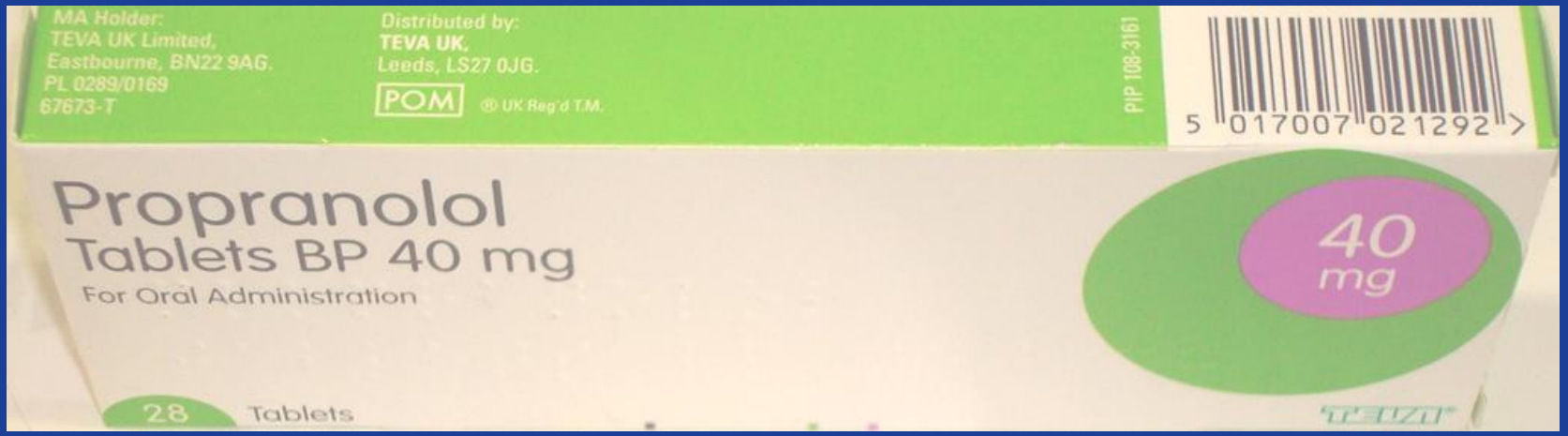
TEVA UK Limited,
Eastbourne, BN22 9AG.
PL 0289/0276
24048-V
Distributed by:
TEVA UK,
Leeds, LS27 0JG.
POM
® UK Reg'd T.M.
PIP 105-7132
5 017007 240495
Prednisolone
5 mg Tablets
For Oral Administration
5 mg
28 Tablets
TEVA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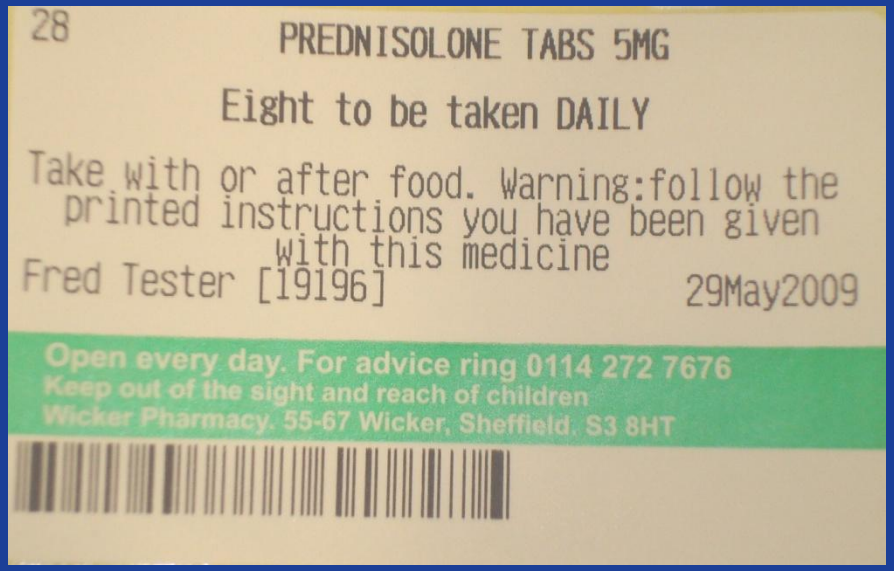
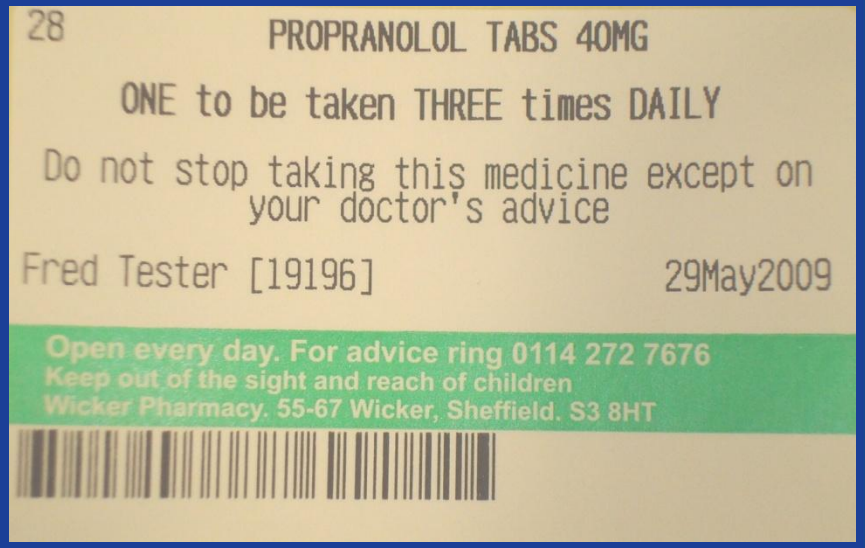
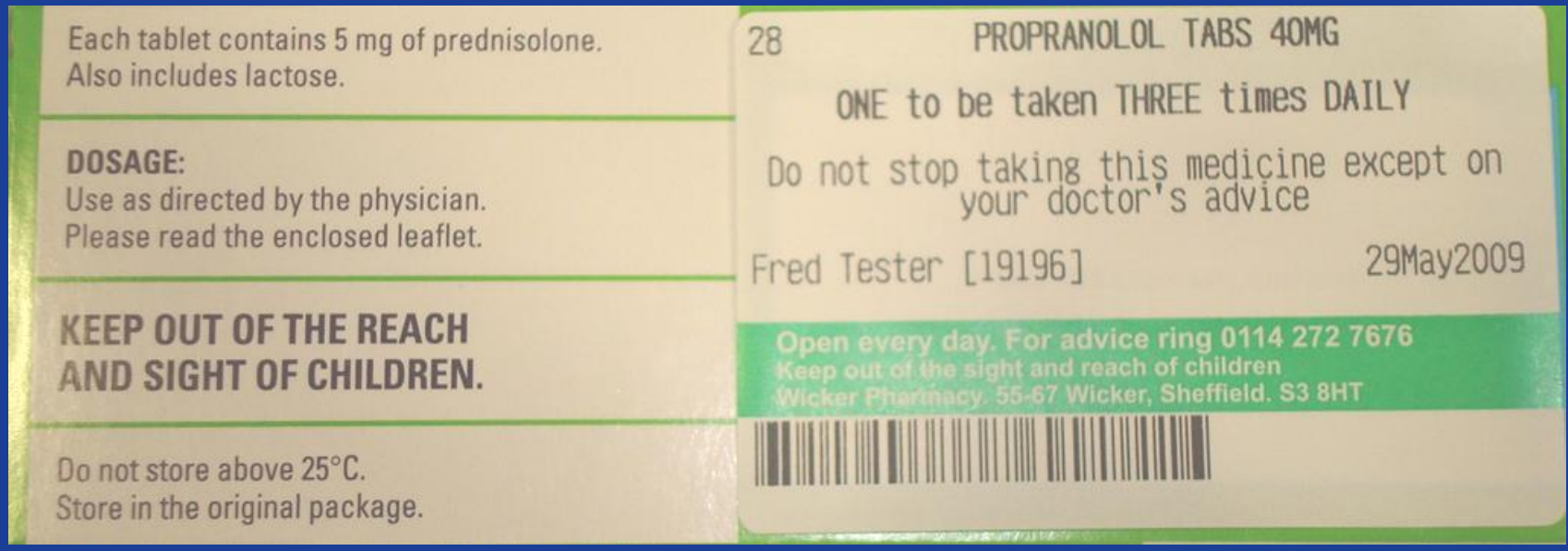
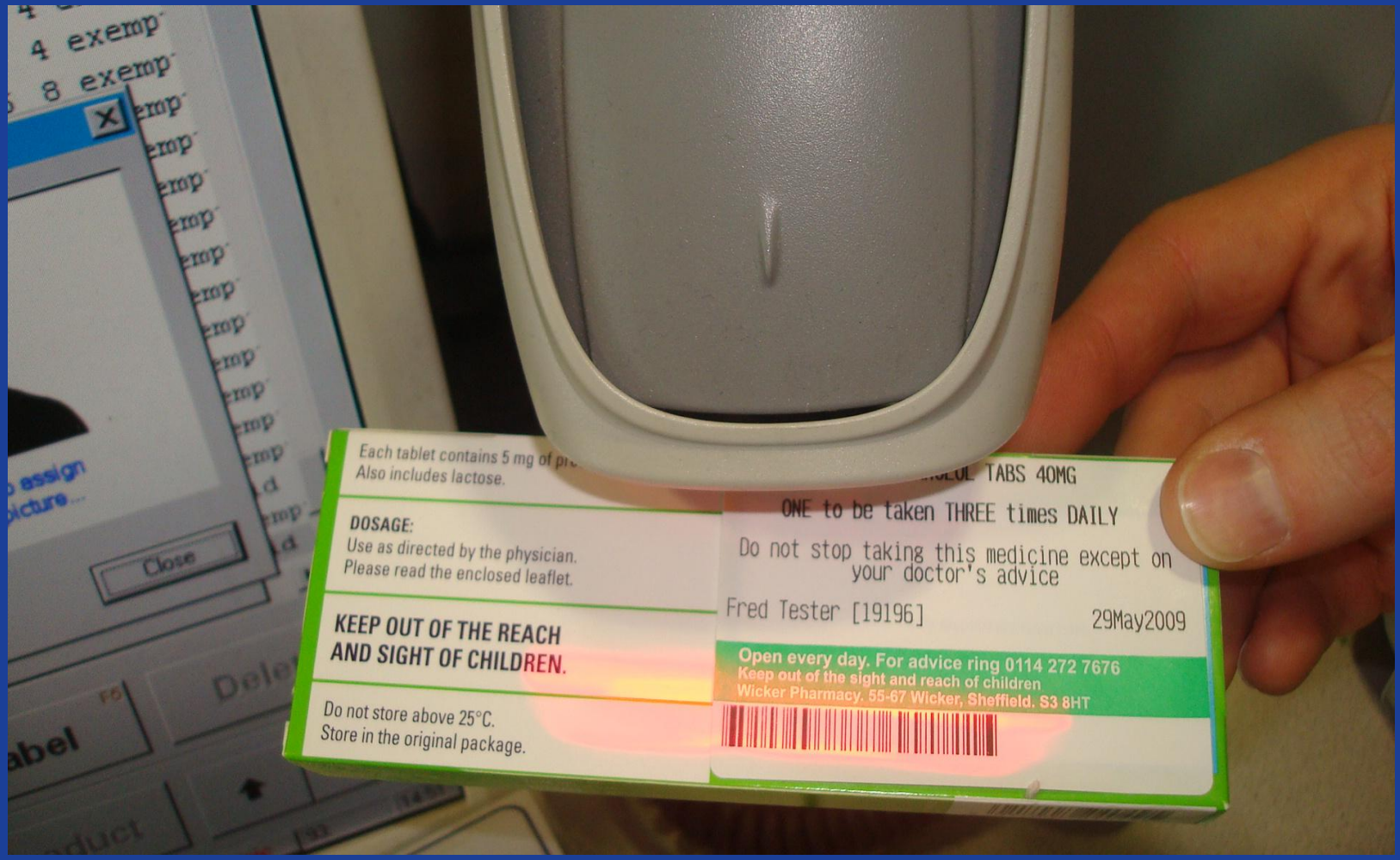
TEVA UK Limited,
Eastbourne, BN22 9AG.
PL 0289/0169
67673-T
Distributed by:
TEVA UK,
Leeds, LS27 0JG.
POM
® UK Reg'd T.M.
PIP 108-3161
5 017007 021292
Propranolol
Tablets BP 40 mg
For Oral Administration
40 mg
28 Tablets
TEVA

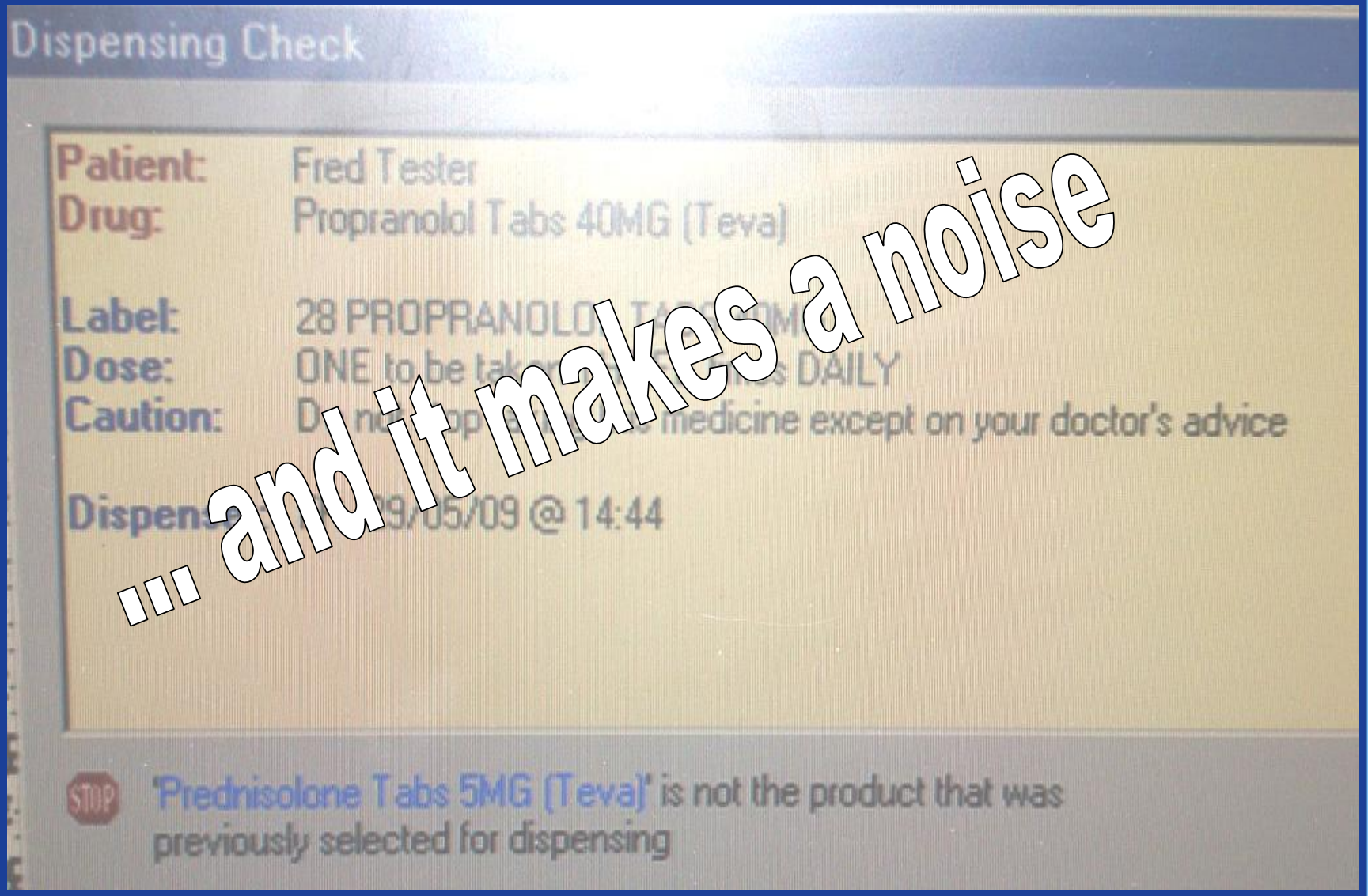

28
PREDNISOLONE TABS 5MG
Eight to be taken DAILY
Take with or after food. Warning:follow the printed instructions you have been given with this medicine
Fred Tester [19196]
29May2009
Open every day. For advice ring 0114 272 7676
Keep out of the sight and reach of children
Wicker Pharmacy. 55-67 Wicker, Sheffield. S3 8HT

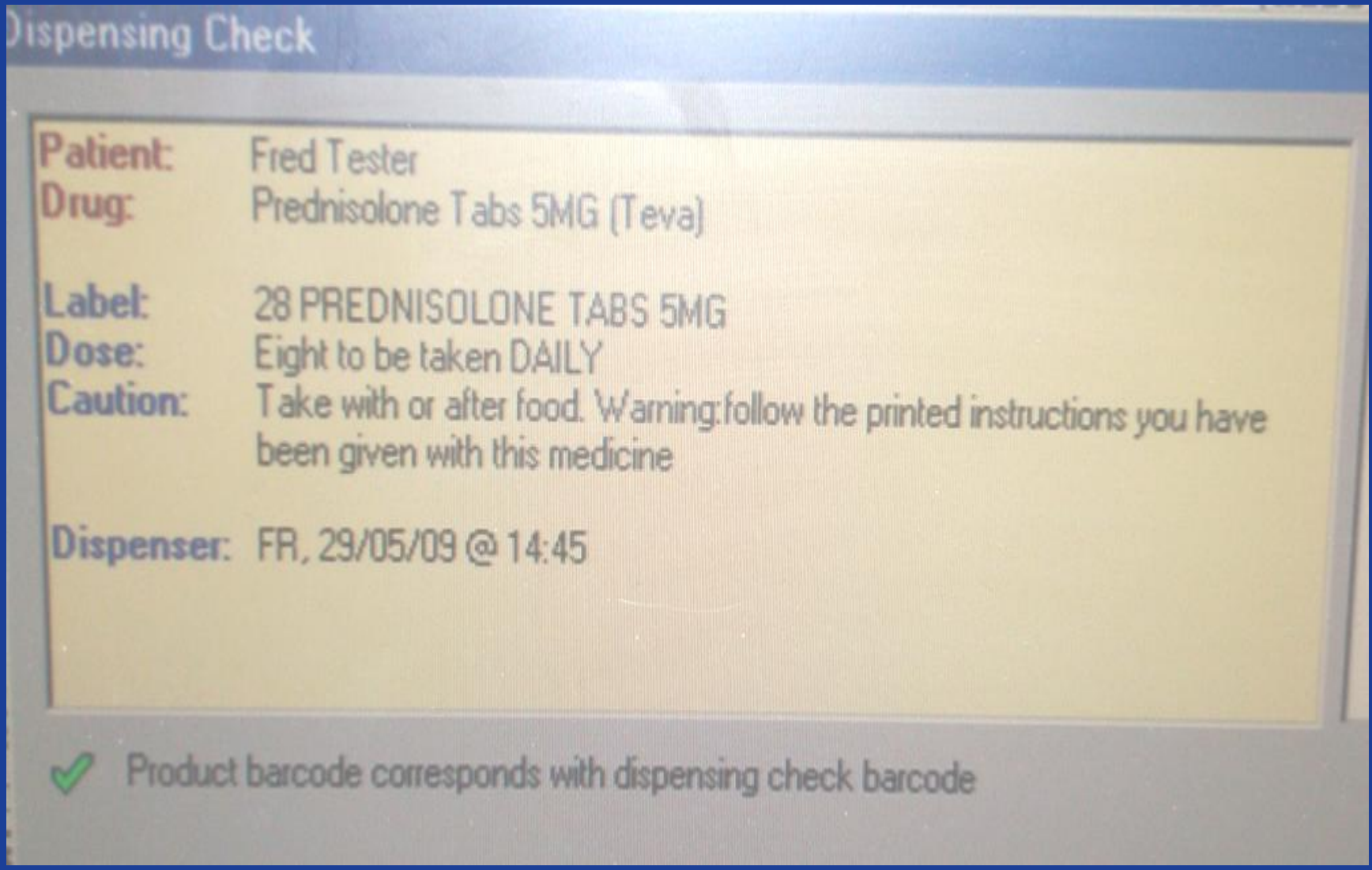

28
PROPRANOLOL TABS 40MG
ONE to be taken THREE times DAILY
Do not stop taking this medicine except on your doctor's advice
Fred Tester [19196]
29May2009
Open every day. For advice ring 0114 272 7676
Keep out of the sight and reach of children
Wicker Pharmacy. 55-67 Wicker, Sheffield. S3 8HT


Each tablet contains 5 mg of prednisolone.
Also includes lactose.
DOSAGE:
Use as directed by the physician.
Please read the enclosed leaflet.
KEEP OUT OF THE REACH AND SIGHT OF CHILDREN.
Do not store above 25°C.
Store in the original package.
28
PROPRANOLOL TABS 40MG
ONE to be taken THREE times DAILY
Do not stop taking this medicine except on your doctor's advice
Fred Tester [19196]
29May2009
Open every day. For advice ring 0114 272 7676
Keep out of the sight and reach of children
Wicker Pharmacy. 55-67 Wicker, Sheffield. S3 8HT


Paid


Each tablet contains 5 mg of pr
Also includes lactose.
DOSAGE:
Use as directed by the physician.
Please read the enclosed leaflet.
KEEP OUT OF THE REACH AND SIGHT OF CHILDREN.
Do not store above 25°C.
Store in the original package.
TABS 40MG
ONE to be taken THREE times DAILY
Do not stop taking this medicine except on your doctor's advice
Fred Tester [19196]
29May2009
Open every day. For advice ring 0114 272 7676
Keep out of the sight and reach of children
Wicker Pharmacy. 55-67 Wicker, Sheffield. S3 8HT
Close


Dispensing Check
Patient: Fred Tester
Drug: Propranolol Tabs 40MG (Teva)
Label:
Dose:
Caution:
Dispens
DAILY
medicine except on your doctor's advice
'Prednisolone Tabs 5MG (Teva)' is not the product that was previously selected for dispensing
... and it makes a noise


Dispensing Check
Patient: Fred Tester
Drug: Prednisolone Tabs 5MG (Teva)
Label: 28 PREDNISOLONE TABS 5MG
Dose: Eight to be taken DAILY
Caution: Take with or after food. Warning:follow the printed instructions you have been given with this medicine
Dispenser: FR, 29/05/09 @ 14:45
Product barcode corresponds with dispensing check barcode

Bar coding evidence base

- Few ‘quality studies’ [prospective, before – after, controlled, cross-over]
- Number of studies ≈100 and mainly American
- bar coding has been shown experimentally to significantly improve both the speed and accuracy of data entry in a wide range of settings
- Issues of implementation cost and product identification standards are highlighted
- Also (Ross Koppel) workarounds JAMA

Evidence

Reference	Design	summary
Chester M, Zilz D. Effects of bar coding on a pharmacy stock replenishment system. *Am J Hosp Pharm.* 1989; 46:1380-5.	Prospective, before–after	After implementation of a bar-code stock-ordering system, the error rate in an ambulatory care pharmacy decreased from 1.0% to 0.2%. The overall time saving was estimated to be 104 technician hours.
Hanson L, Weinswig M, De Muth J. Accuracy and time requirements of a bar-code inventory system for medical supplies. *Am J Hosp Pharm.* 1988; 45: 341-5.	Prospective, before–after	Four months after implementation of a bar-code inventory system for issuing medical supplies to nursing units, the mean time needed to take an order increased to 4.48 minutes from 4.14 minutes ($p < 0.01$), the time needed to enter an order decreased to 1.36 minutes from 7.10 minutes ($p < 0.01$), and the accuracy of the inventory improved ($p < 0.001$).
Dinklage K, White S, Lenhart J et al. Accuracy and time requirements of a barcode inventory system for controlled substances. *Am J Hosp Pharm.* 1989; 46: 2304-7	Prospective, controlled	Mean data-entry time for an existing automated controlled-substances inventory system was not significantly faster with bar-code data entry than with keyboard entry ($p > 0.05$), but mean percent entry error was significantly lower with the bar-code method (0.79% versus 1.53%) ($p = 0.0167$).
Kanmaz TJ, Haupt BA, Peterson AM. Comparison of manual and bar-code systems for documenting pharmacists' interventions. *Am J Health-Syst Pharm.* 1997; 54:1623-6.	Prospective, cross-over, controlled	The data-entry error rate with a bar-code system for documenting pharmacists' clinical interventions was 1.7%, compared with 5.8% for a manual system. The bar-code system was associated with an increased cost of $35.85 per pharmacist per year. The time per intervention using bar codes was significantly shorter ($p < 0.01$).
Chua RV, Cordell WH, Ernsting KL et al. Accuracy of bar codes versus handwriting for recording trauma resuscitation events. *Ann Emerg Med.* 1993; 22:1545-50.	Prospective, controlled	The mean ± S.D. total number of errors per record with computerized bar-code data entry was 2.63 ± 0.24, compared with 4.48 ± 0.30 for manual entry ($p < 0.0001$) during resuscitation in cases of trauma. The mean number of omissions per record and inaccuracies per record were less with bar-code entry ($p = 0.0001$ and $p = 0.0038$, respectively).
Meyer GE, Brandell R, Smith JE et al. Use of bar codes in inpatient drug distribution. *Am J Hosp Pharm.* 1991; 48:953-66.	Prospective, before–after	A time saving of 1.52 seconds per dose occurred with bar-code dispensing in an inpatient drug distribution system.
Barry G, Bass GJ, Eddlemon J et al. Barcode technology for documenting administration of large-volume intravenous solutions. *Am J Hosp Pharm.* 1989; 46: 282-7.	Prospective, before–after	Patient accountability for charges for large-volume plain intravenous solutions in two nursing units improved 19% when using bar-code technology

Take home messages

- You need the learning and evidence from harm, then you manage the SYSTEM to make it less likely
- Resources are abundant – take whatever you need, NOW
- For the resources developed by the NPSA the evidence is provided.
- You may discover specific local issues – that's why you are here to learn.
- Remember to share, we are all in this together. 12 over 3 months