

# WHO Challenge and Medication Safety Northern Ireland

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# Harm in numbers

8.5 million

1,626 additional bed

days

2 deaths

## Medication safety in the NHS

At the heart of future NHS challenges



of people over 70 years old take five or more medicines. With an ageing population and multiple chronic medical conditions these numbers will just keep increasing



non-elective hospital admissions are due to medicines



of these are preventable

5 classes of medicine account for most admissions

NSAIDs

Antiplatelets

Anticoagulants

Diuretics

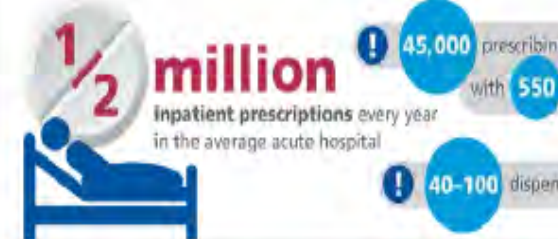
Antihypertensives



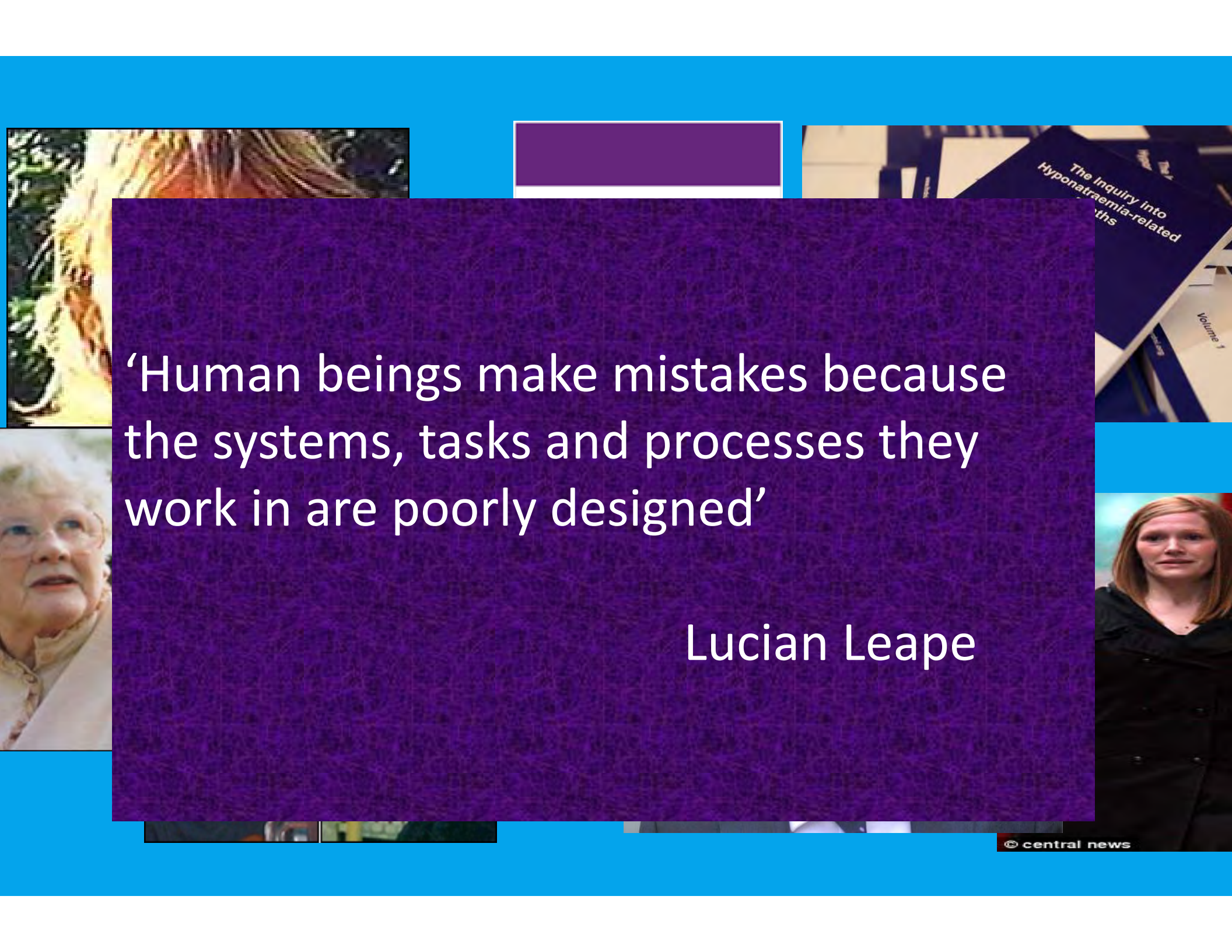
prescriptions are issued every year in primary care

50 million prescribing errors

400,000 33 million dispensing errors



97% of medication errors reported to the NHS result in no or low patient harm



'Human beings make mistakes because the systems, tasks and processes they work in are poorly designed'

Lucian Leape

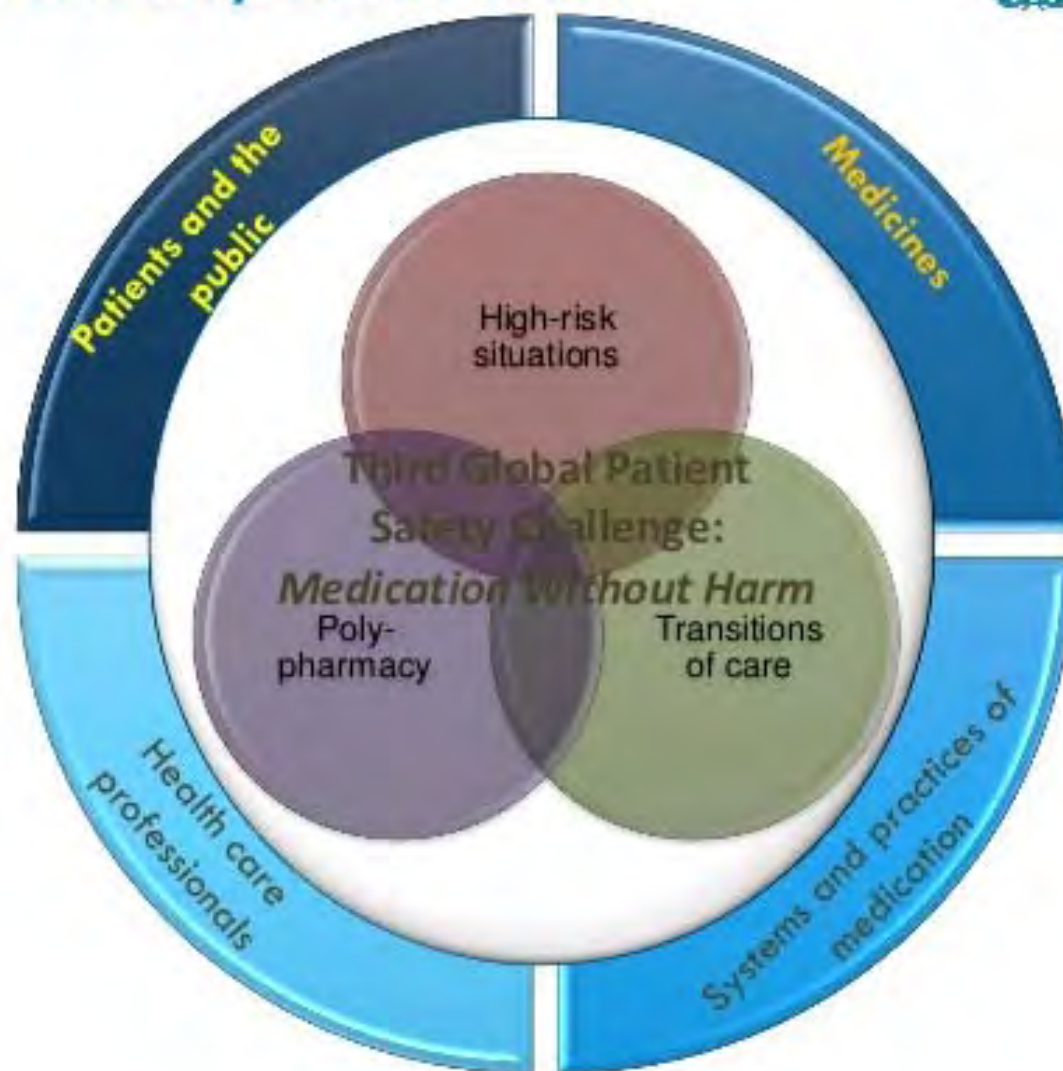
**WHO Global Patient Safety Challenge**  
*Medication Without Harm*  
**Global Launch, 29 March 2017**



reduce severe avoidable medication-related harm by  
%, globally in the next 5 years



# Domains and Key action areas



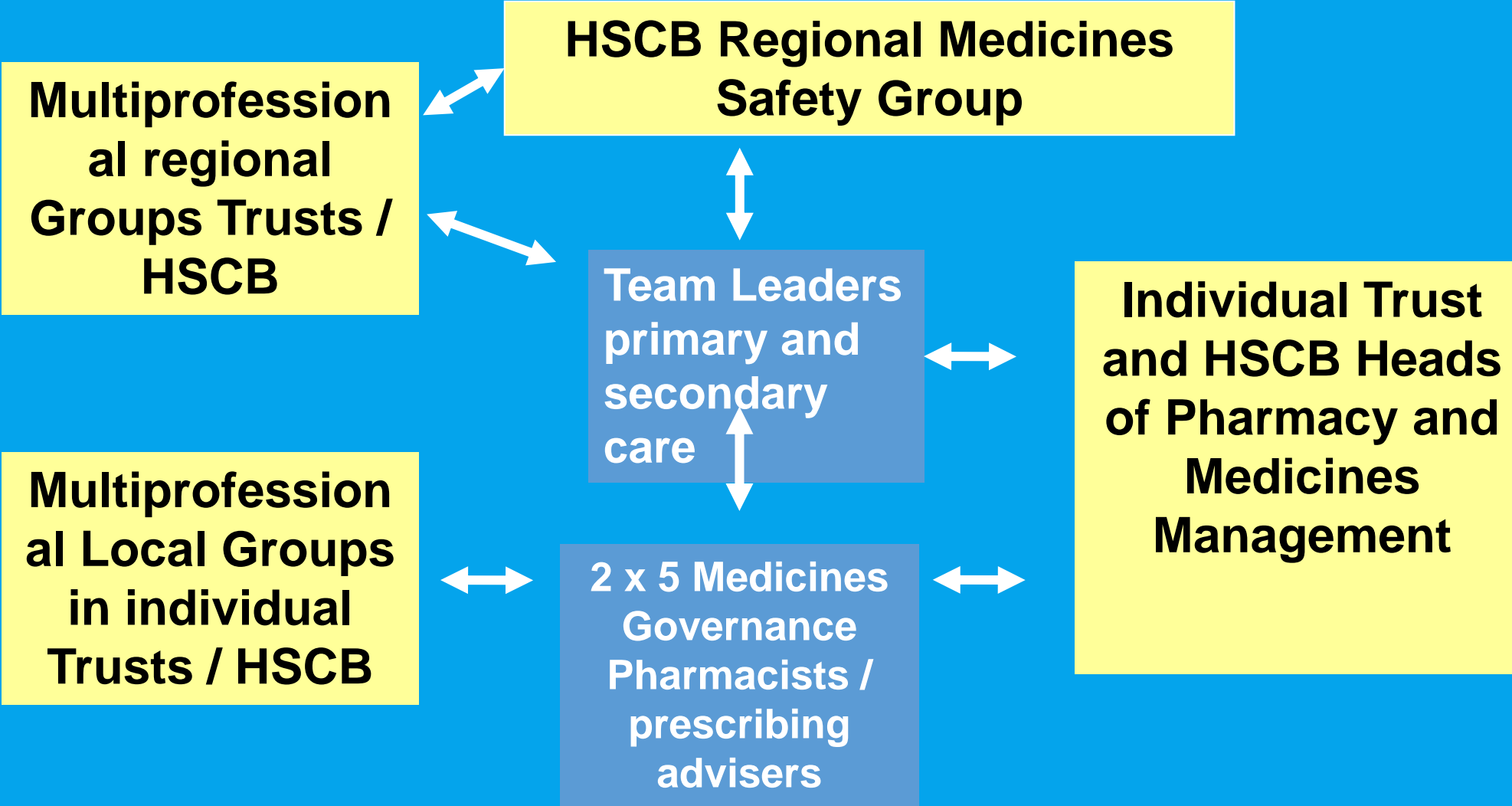


## Third action

- ✓ Strengthen the quality of data to monitor medication related harm
- ✓ Provide guidance and develop strategies, plans and tools
- ✓ Produce a strategy for research priorities
- ✓ Monitor and evaluate the impact of the challenge
- ✓ Work with regulatory bodies to support safe packaging and labelling
- ✓ Design tools and technologies that empower patients to safely manage their own medicines

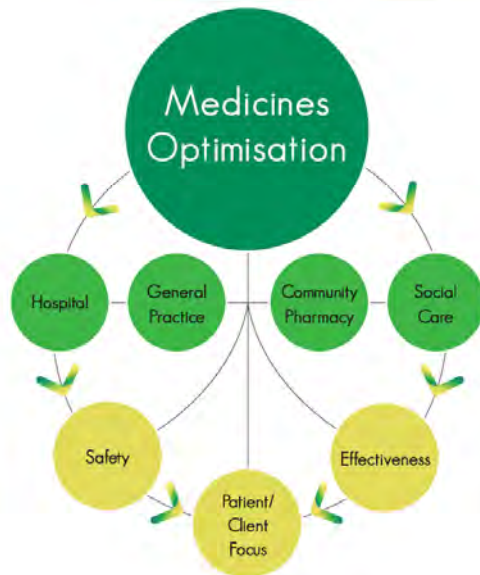


# NI Medication Safety Structure





## Medicines Optimisation Quality Framework



### Quality Domain

### Medicines Optimisation Standards

#### Patient/Client Focus

Patients are involved in decisions about their treatment with medicines.

1. Safer Prescribing with Patient Involvement
2. Better Information about Medicines
3. Supporting Adherence and Independence

#### Safety

Preventing and minimising harm related to medicines use.

4. Safer Transitions of Care
5. Risk Stratification of Medicines
6. Safety/Reporting and Learning Culture

#### Effectiveness

Right patient, right medicine, right time, right outcome, right cost.

7. Access to Medicines you Need
8. Clinical and Cost Effective Use of Medicines  
Reduced Waste
9. Clinical Medication Review
10. Administration

# DOH Medication Safety Taskforce

Develop a strategic plan for medicines safety

- ✓ Whole systems approach
- ✓ Make best use of IT and technology
- ✓ Standardise / identify and scale good practice
- ✓ Co-produced plans and solutions
- ✓ Enhanced QI / HFs skills for pharmacy staff
- ✓ Measure improvement

# The NI Medicines Governance Team

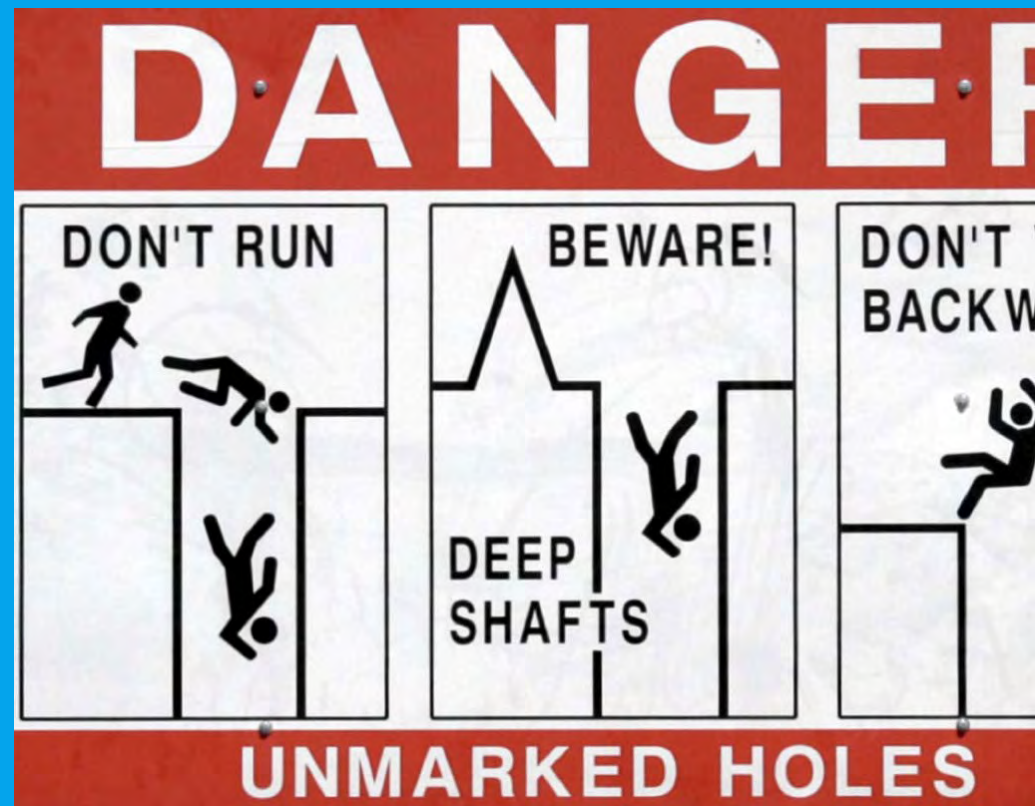
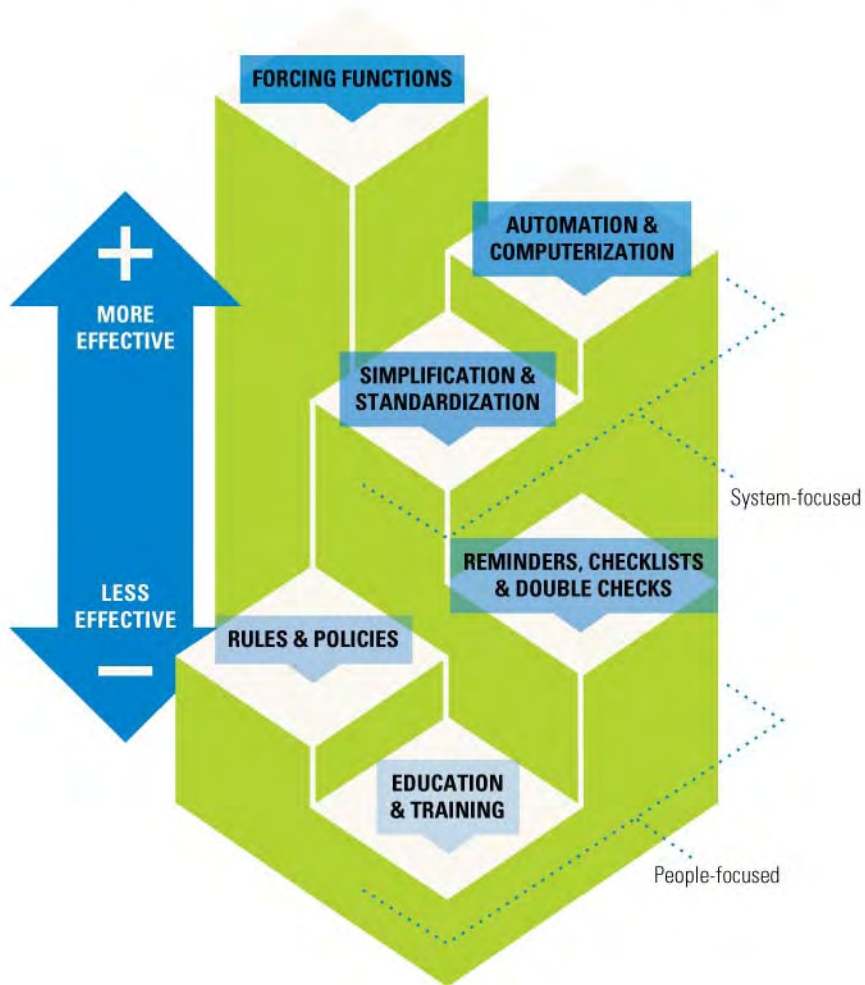
- A networked regional medicines safety team
- Medication incident data management
- Regional approach to addressing medication safety risks
- Safety messaging, best practice guidance and a focus on design for safety
- Undergraduate and postgraduate medication safety training

**Think**



**risk!**

# The Hierarchy of Intervention Effectiveness



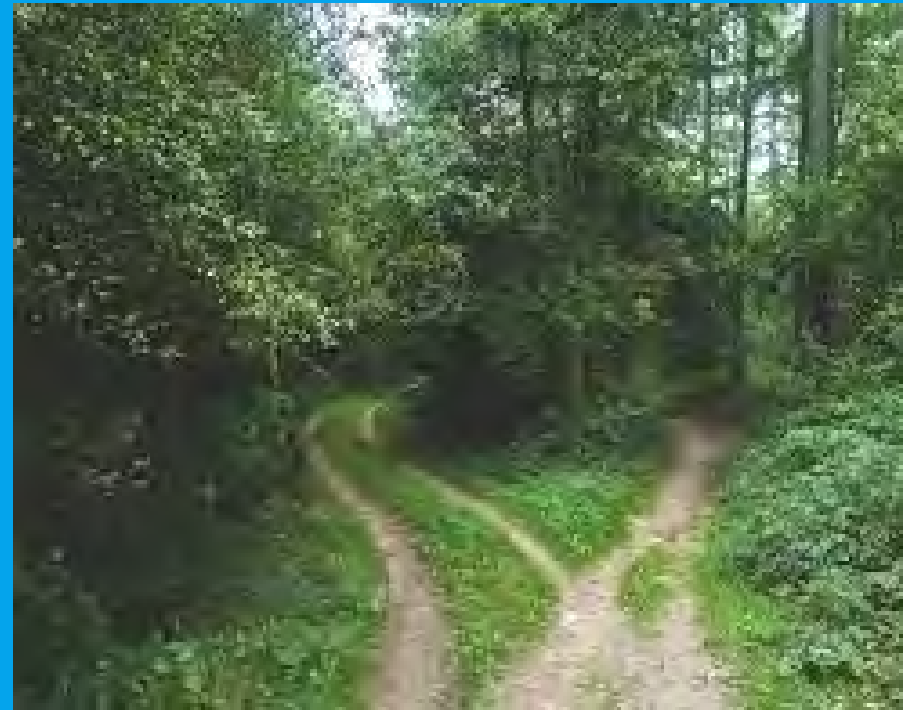
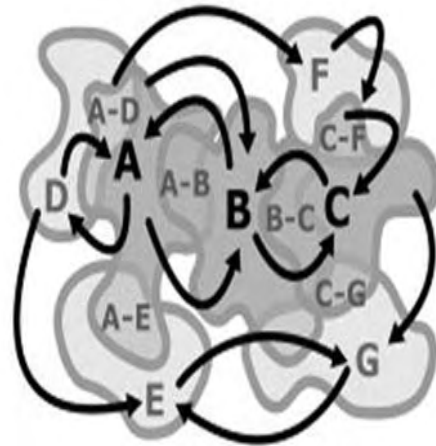


Work-as-Imagined



VS.

Work-as-Done



# Human Factors

Enhancing clinical performance through an understanding of the effects of team work, tasks, equipment, workspace, culture, organisation on human behaviour and abilities and application of the knowledge in clinical settings



# Patient Safety Alert

*Resources to support safe and timely management of hyperkalaemia (high level of potassium in the blood)*

8 August 2018

Reference number: NHS/PSA/RE/2018/006

Resource Alert

essential for the body's normal function, including maintenance of heart rhythm. The way the body responds to hyperkalaemia – a high level of potassium in the blood – is unpredictable; and cardiac arrest can occur without warning. Hyperkalaemia can occur in hospital and being cared for at home.

**Hyperkalaemia is a potentially life-threatening emergency which can occur without treatment.**

Over a three-year period, the National Reporting and Learning System received 35 reports of patients suffering cardiac arrest while in hospital. These suggest that some healthcare professionals may not recognise the clinical assessment, treatment and ongoing monitoring of hyperkalaemia as time critical.

Examples from incident reports read:

"A patient had a raised potassium which required treatment and [a healthcare professional] apparently stated that the day team could deal with it."

"A patient with hyperkalaemia] was prescribed and administered at approximately 09:00, no further review of the patient was undertaken and no further bloods were done until the patient arrested at 09:26."

Local guidance to manage hyperkalaemia found some examples of evidence-based, and/or were not written in a way that was clear during an emergency.

Links to resources on the [NHS Improvement website](#) that can help organisations ensure their clinical staff have easily accessible information for patient investigation, treatment and monitoring options. The website also includes an example of how hospitals could make this easier for staff by pre-preparing sets of the equipment, guidance and medication needed in an emergency.

The webpage also includes short videos organisations can use to help staff recognise that hyperkalaemia is a medical emergency and encourage them to familiarise themselves with local guidance and resources.





### Sharing resources and examples of work

If you have any resources or examples of work developed in relation to hyperkalaemia that you think would be useful to others, please share them with us at [patientsafety.enquiries@nhs.net](mailto:patientsafety.enquiries@nhs.net)

### Actions

**Who:** All organisations providing NHS funded-care for adults or children where blood test results may be received and reviewed, including GP services\*

**When:** To begin as soon as possible and be completed by 8 May 2019

-  1 Identify a senior clinician in the organisation to lead the response to this alert
-  2 Review or produce local guidance (including key steps or easy reference guides) for the management of hyperkalaemia that aligns with the evidence-based sources highlighted in the linked resources
-  3 Ensure that local guidance can be easily accessed by all staff including bank and agency staff
-  4 Ensure relevant guidance and resources are embedded in clinical practice by revising local training and audit
-  5 Use local communication strategies (such as the videos, newsletters, local awareness campaigns, etc) to make all staff aware that hyperkalaemia is a potentially life-threatening emergency and that its timely identification, treatment and monitoring during and beyond initial treatment is essential

\*While general practices will not need hyperkalaemia treatment protocols or equipment, they will need to ensure they implement all actions that will support the right response to any blood test results they receive indicating hyperkalaemia.



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**B B C NEWS**

'Doctor gives fatal insulin dose'



**Second  
insulin  
death  
revealed**

By Seanin Graham  
Health Correspondent

**Lack of training  
factor in tragedy**

**Inquest told of junior doctors  
'ignorance of insulin syringe'**



# Insulin in hyperkalaemia

Belfast City Hospital Trust  
Pharmaceutical Services

## Insulin Safety Information

**The dose of insulin must always be specified in units. Do not abbreviate units.**

### Multidose vials

- Multi-dose vials of insulin are presented as 10ml vials containing 100 international units per ml
- Once opened, the multi-dose vials are stable at room temperature/ in the fridge for up to 4 weeks. **Date** each vial when opened and discard after the specified time.
- **Always use an insulin syringe for drawing up any dose of insulin from a vial.**

### Pens and Cartridges

- If a pen is in use for a named patient it should be stored in the medicine trolley with a patient addressograph attached. Do not store in the fridge.
- The majority of pens can be stored at room temperature for up to 28 days.
- All unopened cartridges and pens should be stored in the fridge.

- August 2001
- 100units insulin administered instead of 10units
- Insulin safety poster developed

# Failure Mode Effects Analysis

	Failure mode (what might happen)	Cause (why)	Effect	Likelihood	Severity	Problem detection	CI
Choice of drug (treatment choice)	wrong amount chosen	<ul style="list-style-type: none"> <li>- don't know</li> <li>- no policy</li> <li>- Don't know policy</li> </ul>	<i>potential for</i> Glucose – Underdose – hypogly.	3	4	9	108
			Ins. – Underdose - K <sup>+</sup> not treated – Overdose - hypogly	3	4	9	108
How much	Wrong insulin Wrong glucose	Don't know product ranges Don't know what should use Policy not comprehensive or explicit	<i>potential for</i> Ins. - Ineffective treatment of K <sup>+</sup>	3	4	9	108
			Glu - Hypogly - Ineffective treatment of K <sup>+</sup>	3	4	9	108
Prescribe	Don't prescribe on chart Wrong chart Incorrect prescription - dose - freq (i.e. not in stat area)	Slip or lapse Wrong chart on bed Kardex design Poor custom and practice (dr admin – not written up)	Prescribed on wrong chart	4	5	7	140
			Duplication of treatment possible	4	5	6	120
			Wrong dose on chart	5	5	5	125
Draw up dose Glucose	Wrong volume	Illegible prescription Lack of knowledge Availability of other volume products (e.g. 50% - 500ml – aseptic stock) No second check	Hyperglycaemia	3	6	7	126
			Hypoglycaemia	3	7	7	147
Insulin	Wrong volume (incl dose as only 1 strength)	Illegible prescription Lack of knowledge Calculation error Wrong syringe No second check Inappropriate abbreviation	Lack of hyper K <sup>+</sup> treatment and hyperglycaemia (underdose) (pot)	1	7	7	49
			Profound hypoglycaemia	7	8 (9)	7	392

# Hyperkalaemia safety solutions

## Preparation of insulin and glucose infusion

- Option 1

- A ready to administer infusion of 10units insulin in 50mls glucose 50%

- Option 2

- A pre-filled syringe / vial containing 10units insulin for addition to 50mls glucose 50%

- Option 3

- A hyperkalaemia kit



# Hyperkalaemia kit



## How to make up 10 units of Actrapid® (soluble) insulin in 50ml glucose 50% vial using the hyperkalaemia kit

Protect the cardiac membrane: give 10ml of calcium gluconate 10% IV over 2 mins (NB if patient on digoxin, and calcium gluconate required, give slowly over 20 mins in 100ml of glucose 5%).

1. With the nurse in charge, obtain an Actrapid® vial from the pharmaceutical fridge.



2. Take the glucose 50% glass vial from the kit. Remove its protective cap.

3. Measure 10 units of insulin using an insulin syringe from the kit:

- Draw the plunger back to the 10 unit mark on the insulin syringe. Check the 10 units of insulin obtained with the senior nurse on duty.
- Note 10 units of insulin is contained in 0.1ml
- Record administration of this and other medicines used to treat hyperkalaemia on the Kardex. Ensure both signatures for double check are documented on the Kardex.



4. Inject the 10 units of insulin into the glucose 50% glass vial.

5. Mix.



6. Take Chemoprotect® Spike from kit and remove protective sheath.



7. Pierce the glucose 50% glass vial with the Chemoprotect® Spike.



8. Screw the 50ml syringe onto Chemoprotect® Spike and draw up the contents of the vial.

9. Remove the 50ml syringe from Chemoprotect® Spike and expel air

10. Administer into a large vein by slow IV injection over 5 mins.



Monitor and document blood glucose 30 mins after administration of insulin/glucose and then hourly up to 6 hours after completion of administration.

Monitor U&Es 30 mins after each administration of insulin/glucose. If good response, check U&Es 1-2 hours after last intervention

**HSC** Belfast Health and Social Care Trust

Adapted from GAIN Guidelines for the treatment of hyperkalaemia in adults (revised 2008). Available at [http://www.gain-ni.org/Publications/Guidelines/hyperkalaemia\\_guidelines.pdf](http://www.gain-ni.org/Publications/Guidelines/hyperkalaemia_guidelines.pdf)  
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# GAIN

GUIDELINES AND AUDIT  
IMPLEMENTATION NETWORK

## Guidelines for the Treatment Hyperkalaemia in Adults

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