

# Clinical instability criteria: An early warning system for EDs

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# Background

Majority of patients suffering in-hospital adverse events have clear warning signs

- abnormal vital signs
- new complaint / change in behaviour

Early warning systems

- aim to decrease mortality & morbidity
- early & appropriate management of clinical instability
- current systems focused on in-patient care
  - Medical Emergency Teams (METs)
  - Medical Early Warning Systems (MEWS)

- few systems for EDs

# Problem

## Lack of ED early warning systems

- EDs manage clinically unstable patients within their own resources
- no consistent approach to defining clinical instability
- inexperienced staff may be reluctant to report clinical instability
- delays to intervention or under treatment
- ED CIC implemented in 2006
  - loaded onto ED clinical guidelines
  - in-service education
  - CIC log book
  - Jan 2009 = 1 CIC activation

# Aims & methods

## Aim

- to evaluate changes made to the Clinical Instability Criteria in the Emergency Department at The Northern Hospital

## Design

- retrospective audit

## Sample

- 1522 CIC activations from May 09 to Dec 10
- random sample of 10% of CIC activations per month selected from CIC log book
- total sample: 147 patients



# Aims

## Setting - Emergency Department

- over 61,700 patients pa
  - 20% paediatrics
  - 25% admission rate
- 46 treatment areas
- triage distribution
  - Cat 1: 1.1% ( seen immediately)
  - Cat 2: 12.6% ( seen <10 mins)
  - Cat 3: 34.7% ( seen <30 mins)
  - Cat 4: 47.9% ( seen <1 hr)
  - Cat 5: 3.4% ( seen < 2hrs)



# Intervention

## Revised ED CIC May 2009

- CIC log book
- posters in each cubicle
  - adult & paediatric ED CIC
  - CIC activation process
- in-service education
- ED CIC core component of orientation for medical and nursing staff

# ED Clinical Instability Criteria - adults

<b>Airway / Breathing</b>	RR <ul style="list-style-type: none"> <li>• &lt;10 / min</li> <li>• &gt;30 / min</li> </ul>	<ul style="list-style-type: none"> <li>• SpO<sub>2</sub> &lt;90% (on O<sub>2</sub> 10 L/min via mask)</li> </ul>	<ul style="list-style-type: none"> <li>• Stridor</li> <li>• Upper airway obstruction</li> <li>• Threatened airway</li> </ul>	ABG <ul style="list-style-type: none"> <li>• pH &lt;7.20</li> </ul>
<b>Circulation</b>	SBP <ul style="list-style-type: none"> <li>• &lt;90 mmHg</li> <li>• &gt;200 mmHg</li> </ul>	HR <ul style="list-style-type: none"> <li>• &lt;50 / min</li> <li>• &gt;120 / min</li> </ul>	Urine output <ul style="list-style-type: none"> <li>• &lt;20 mls / hr</li> <li>• &lt;100 mls / 6 hrs</li> </ul>	
<b>Disability</b>	<ul style="list-style-type: none"> <li>• Sudden decrease in consciousness (fall in GCS &gt; 2)</li> </ul>	<ul style="list-style-type: none"> <li>• Repeated or prolonged seizures</li> </ul>		

## Worried?

those patients who may not meet the above criteria but have a sudden deterioration in their medical condition, requiring urgent medical review

# ED Clinical Instability Criteria - paediatrics

Airway/Breathing	Tachypnoea	<ul style="list-style-type: none"> <li>• SpO<sub>2</sub> &lt;90% (on O<sub>2</sub> 10 L/min via mask)</li> </ul>	<ul style="list-style-type: none"> <li>• Stridor</li> <li>• Upper airway obstruction</li> <li>• Threatened airway</li> </ul>	ABG <ul style="list-style-type: none"> <li>• ph &lt;7.2</li> </ul>
• Term - 3 mths	>60			
• 4-12 mths	>50			
• 1-4 yrs	>40			
• 5-12 yrs	>30			
• 12 yrs+	>30			
Circulation	Hypotension	Bradycardia	Tachycardia	
• Term - 3 mths	<50	<100	>180	
• 4-12 mths	<60	<90	>180	
• 1-4 yrs	<70	<80	>160	
• 5-12 yrs	<80	<60	>140	
• 12 yrs+	<90	<100	>130	
Disability	<ul style="list-style-type: none"> <li>• Sudden decrease in consciousness (fall in GCS &gt; 2)</li> </ul>	<ul style="list-style-type: none"> <li>• Repeated or prolonged seizures</li> </ul>		

Worried?

those patients who may not meet the above criteria but have a sudden deterioration in their medical condition, requiring urgent medical review

# ED CIC - activation process

The CIC process should be followed if a patient meets one or more of the CIC criteria.

The initiation of CIC should be irrespective of the allocated triage category

Do not call a MET call in the ED

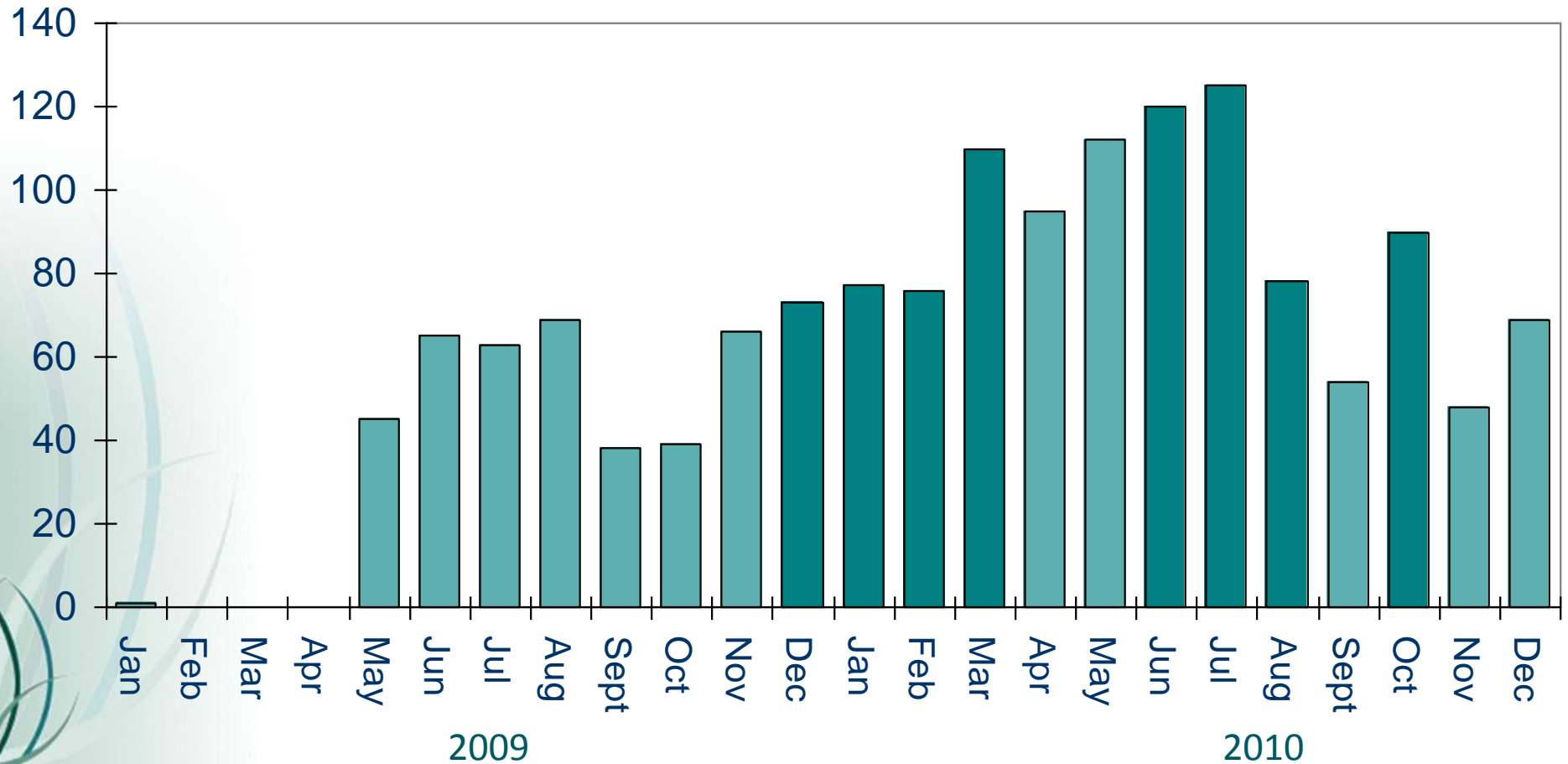
Inform the nurse I/C and the ED Physician of the patient's condition

A Bradman must be placed in the CIC book

The patient must be reviewed within 5 minutes by the ED Physician or ED Registrar overnight

# Results

## CIC activations



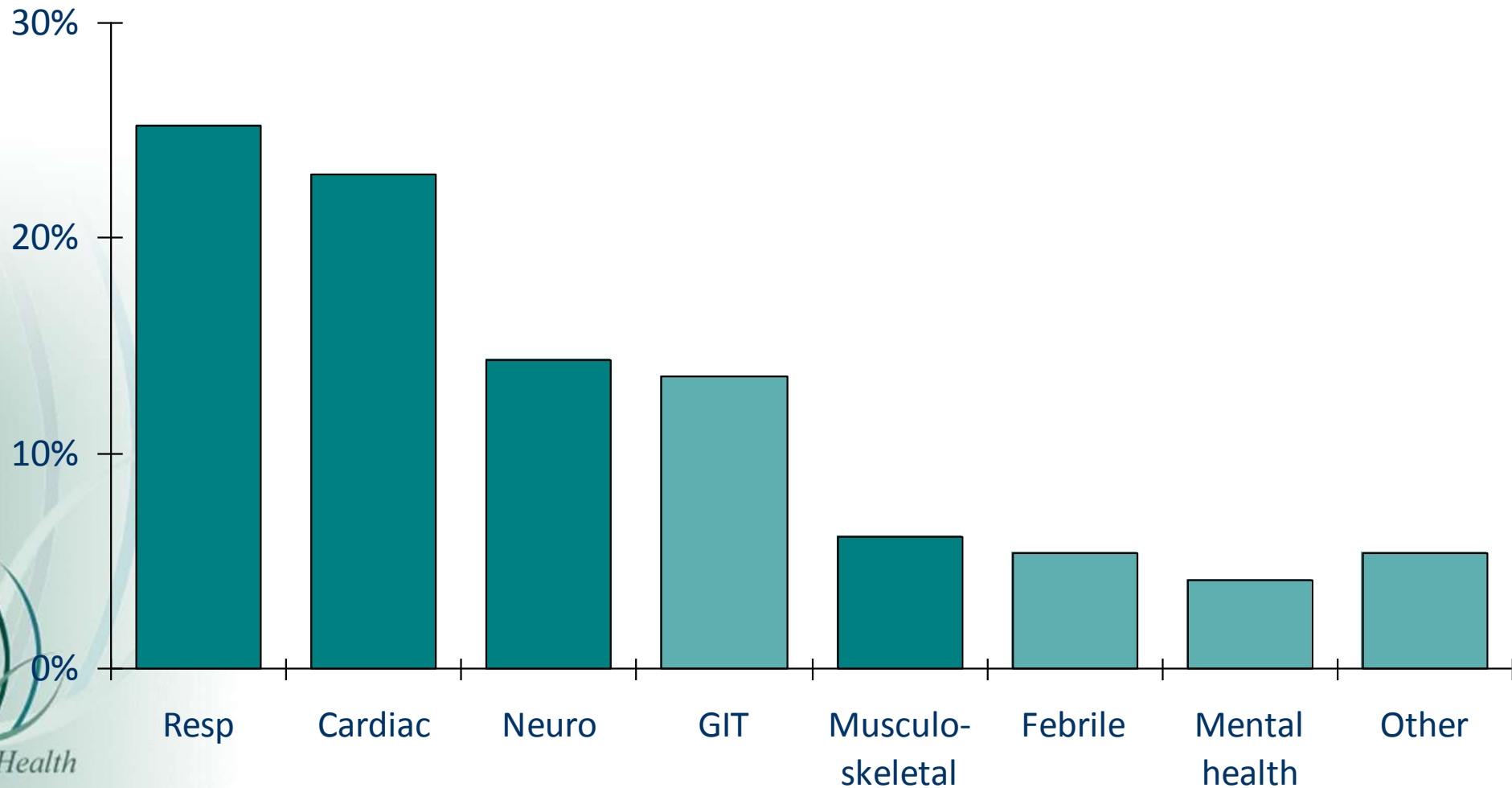
# Results

## Patient characteristics

- age = 65 years (Mdn)
- 53% males
- 65% transported to ED by ambulance
- triage category distribution
  - 3% ATS 1 (seen immediately)
  - 45% ATS 2 (seen within 10 mins)
  - 42% ATS 3 (seen within 30 mins)
  - 10% ATS 4 (seen within 60 mins)

# Results

## Presenting problem



# Results

## Activations

- location
  - 8% resuscitation cubicles
  - 55% monitored cubicles
  - 31% general adult cubicles
  - 5% paediatric cubicles



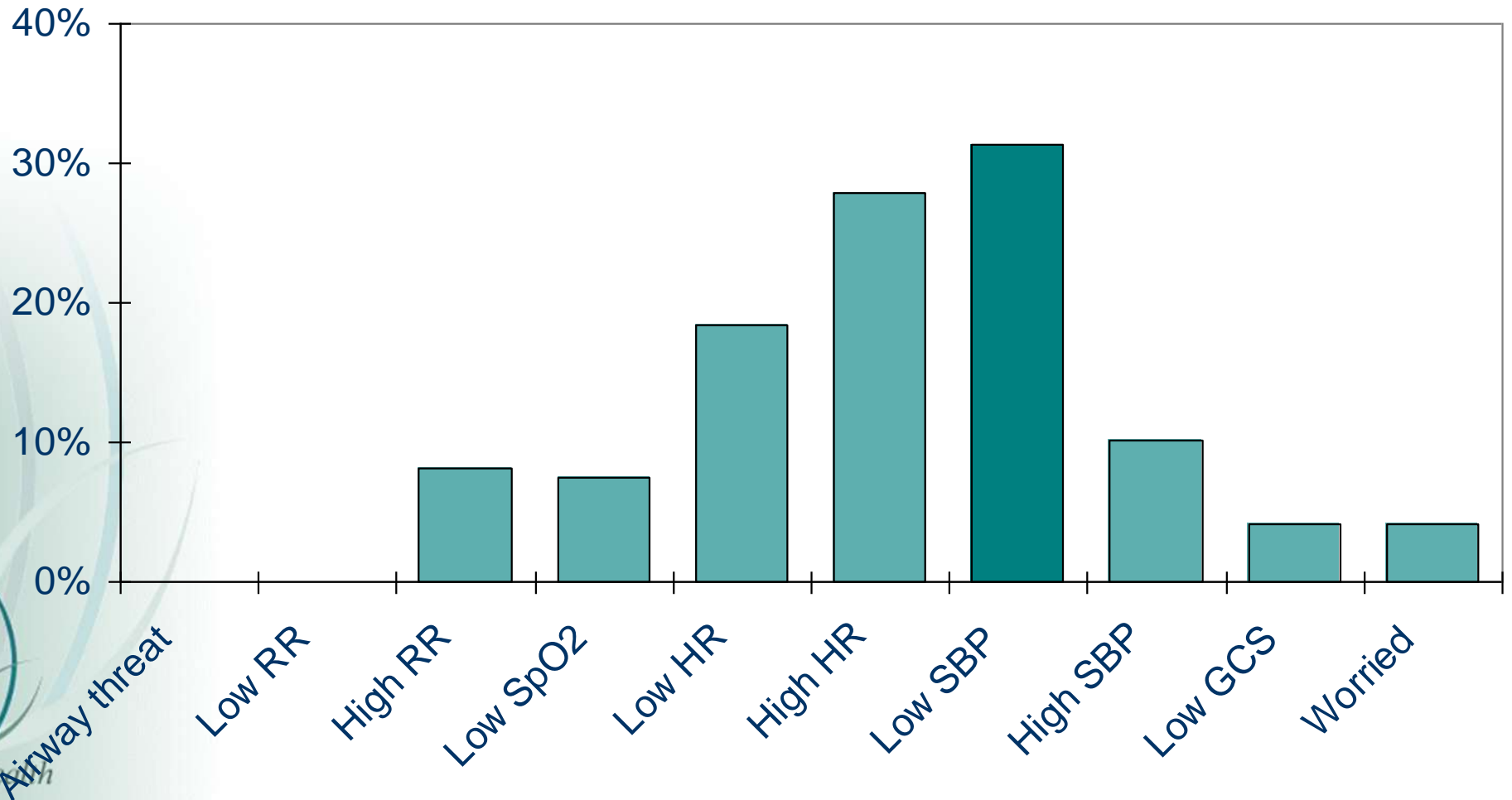
# Results

## Activations

- personnel
  - 91% nurses
    - 69% - no PG qualification in emergency nursing
    - 21% - PG qualifications in emergency nursing
  - 1% medical staff
  - 8% missing
- » documentation
  - 85% nursing notes
  - 16% medical notes

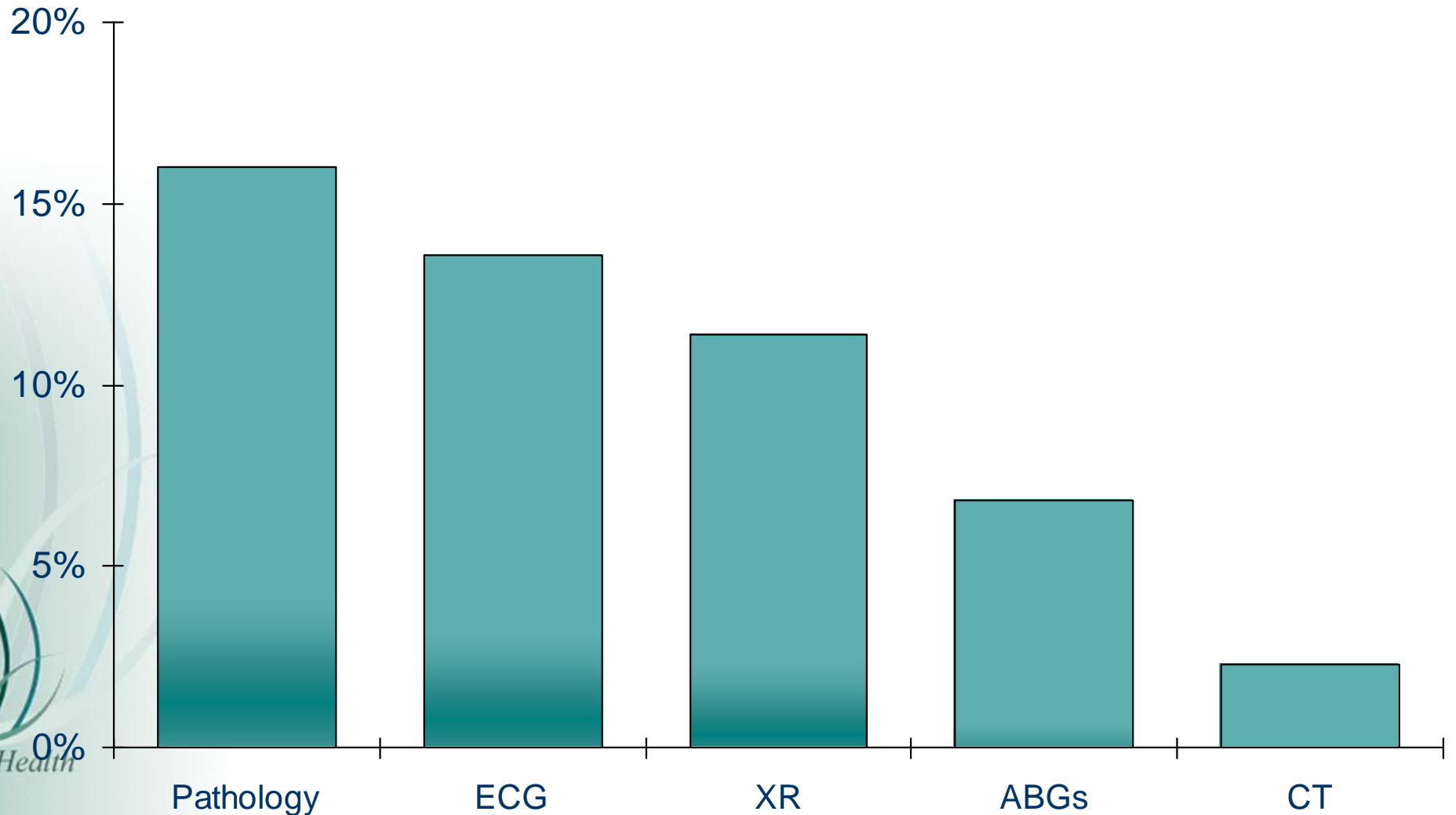
# Results

## Indications for CIC activation



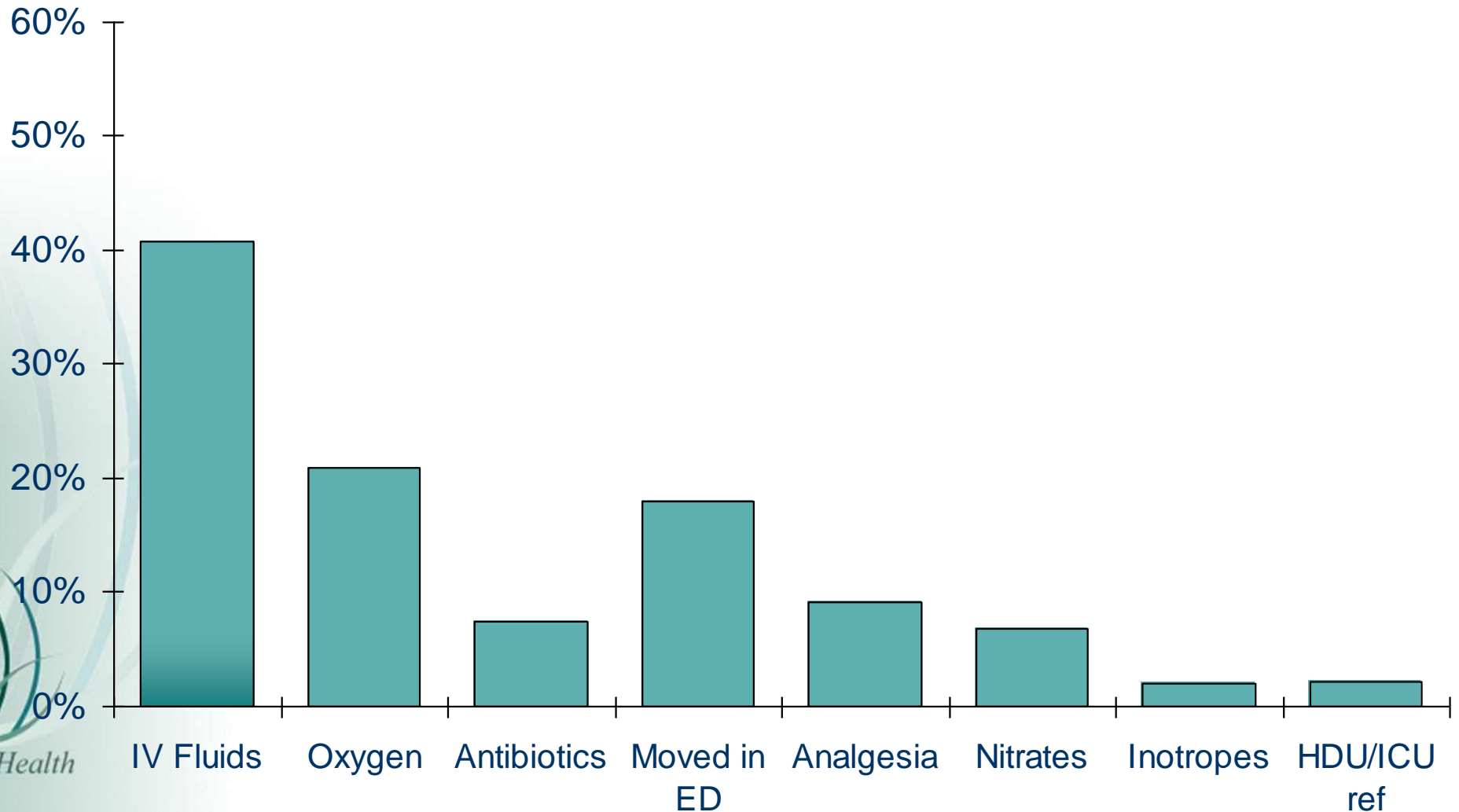
# Results

## Investigations from CIC activation



# Results

## Interventions from CIC activation



# Results

## Timing of CIC activations

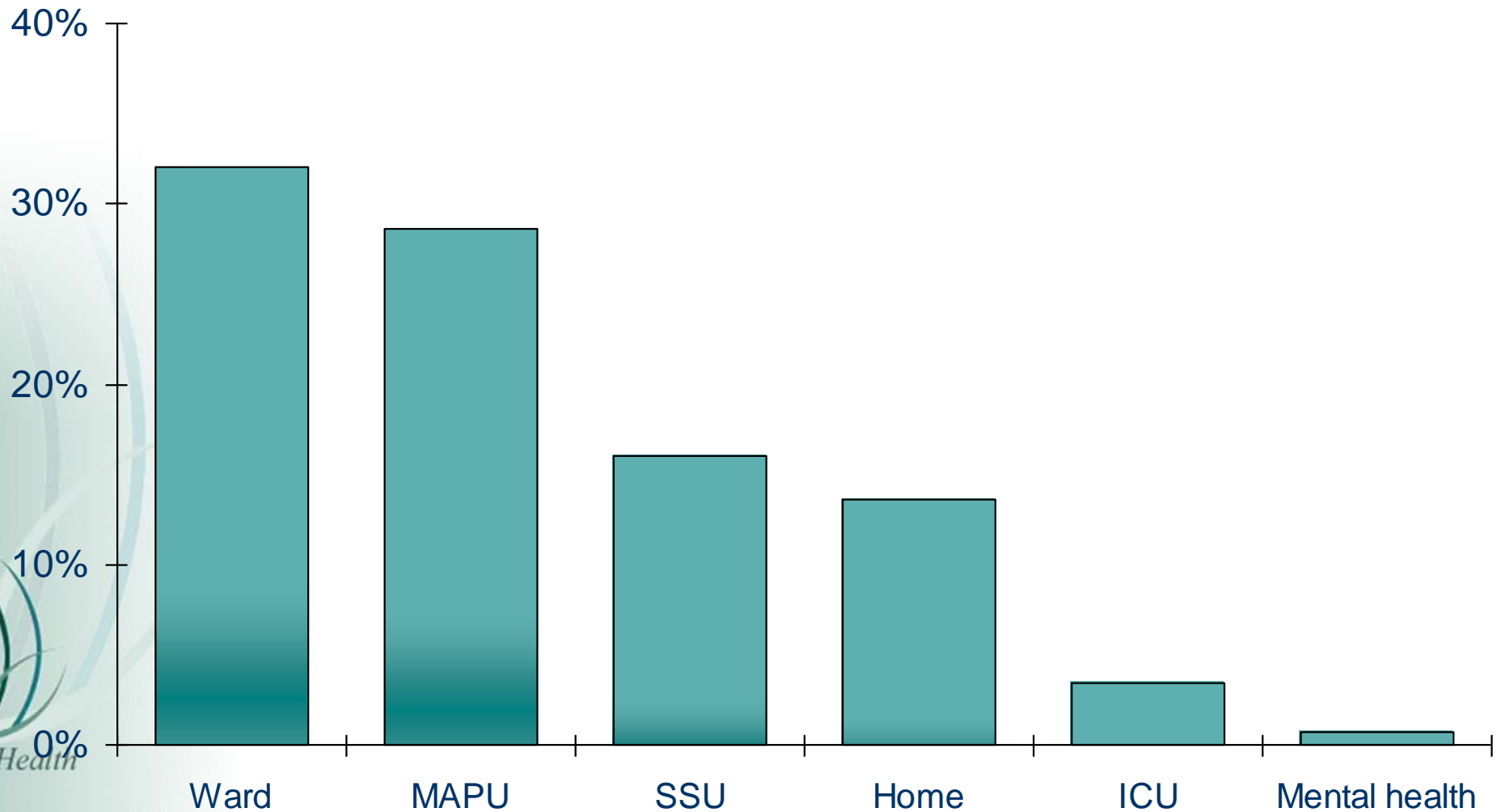
- duration between normal and abnormal observations = 30 mins (Mdn)
- median time to CIC activation after documented abnormalities = 5 minutes (Mdn)

## Resolution of clinical instability

- 72% resolved clinical instability
- duration of clinical instability = 45 minutes (Mdn)
- 6% required recurrent CIC activations

# Results

## Patient disposition



# Conclusion

## ED Clinical Instability Criteria

- enables rapid identification of patients at risk of clinical deterioration
  - particularly by less experienced staff
- empowers nurse - doctor communication
- facilitates expert clinician review & decision making
- expedites treatment & referral

