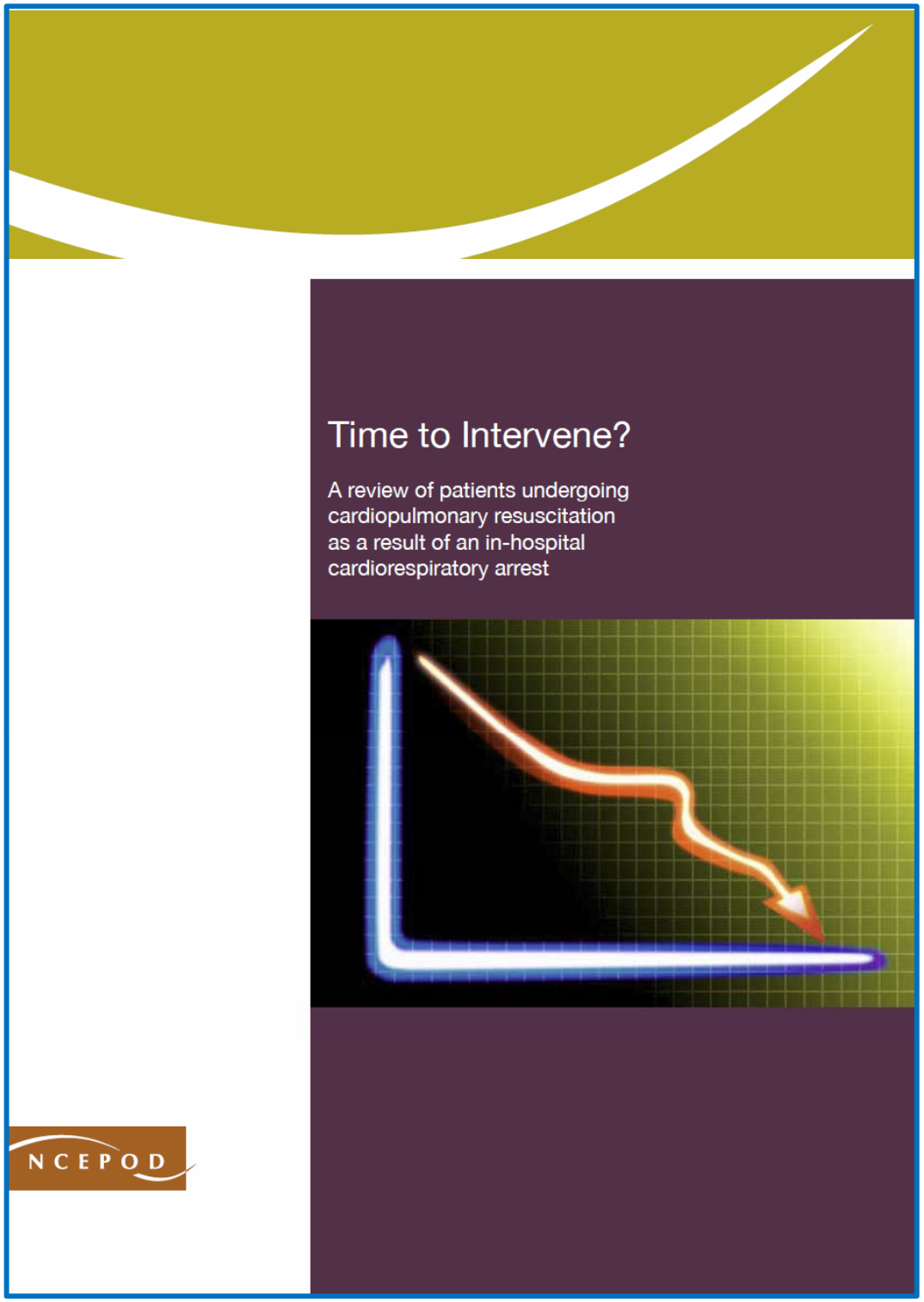


Recognising & responding to deterioration

Simple, yet surprisingly complex

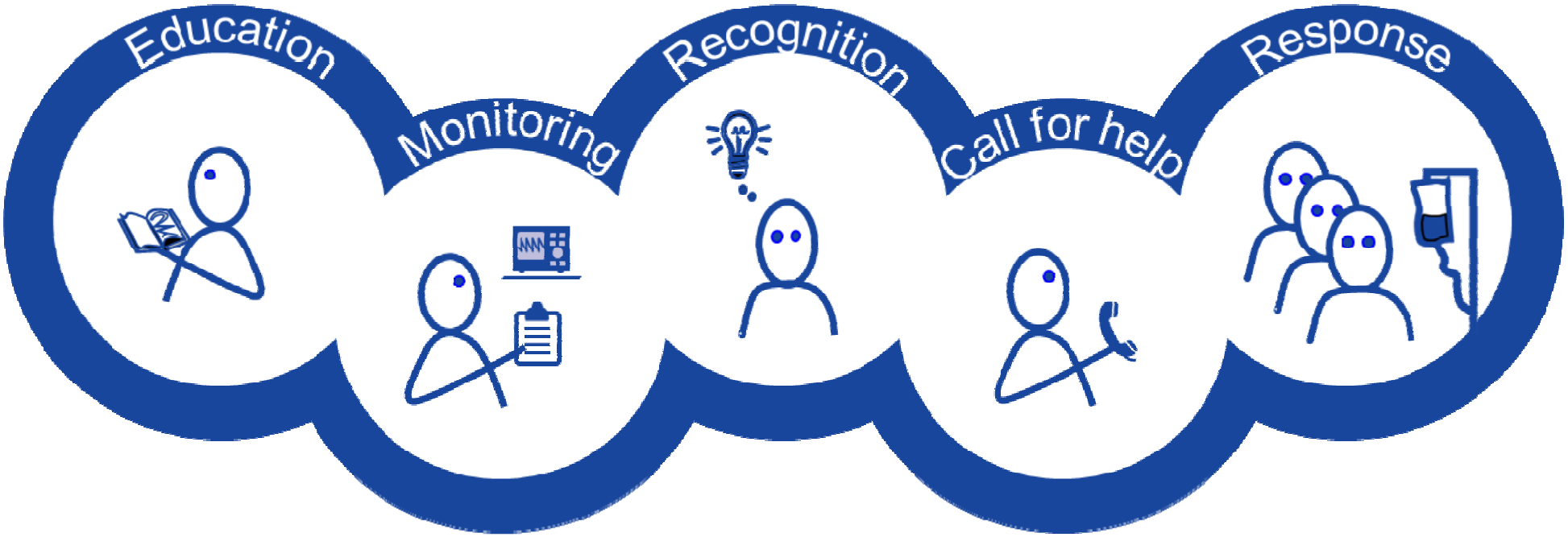
Professor Gary B Smith, FRCA, FRCP

Centre of Postgraduate Medical Research & Education
School of Health and Social Care, Bournemouth University

Were cardiac arrests avoidable?

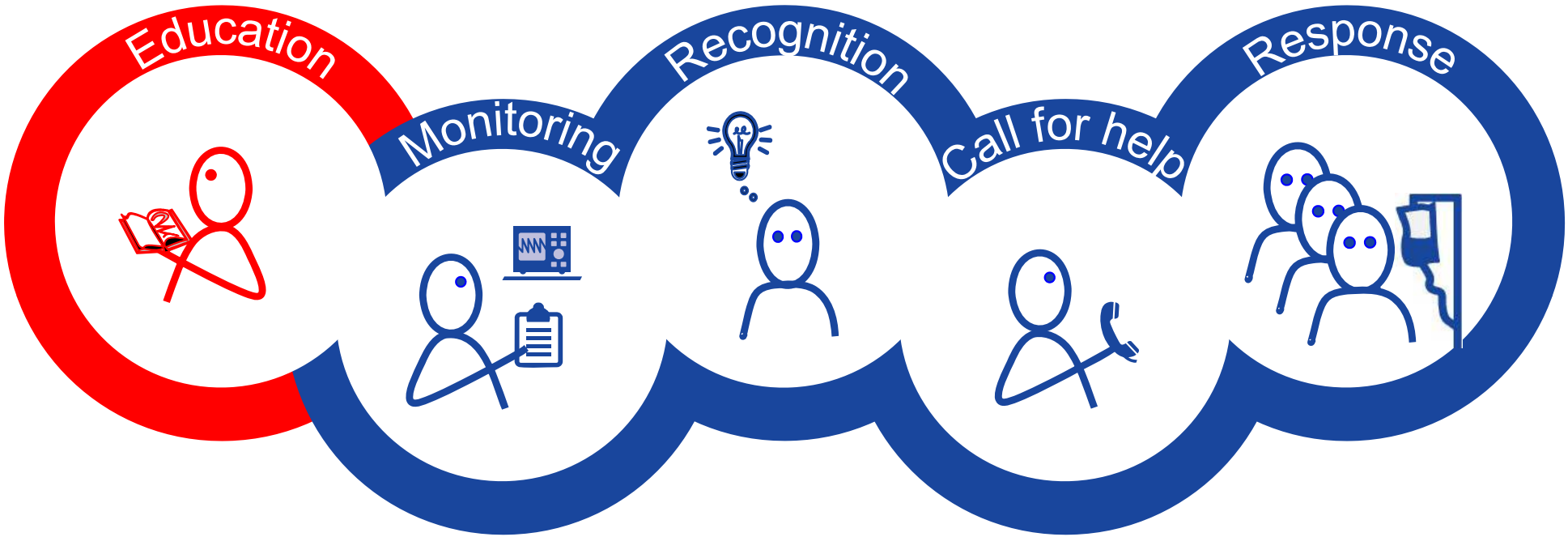
Avoidable cardiac arrest	n	%
Yes	156	37.8
No	257	62.2
Subtotal	**413**	
Insufficient data to assess	113	
Total	**526**	

Chain of prevention



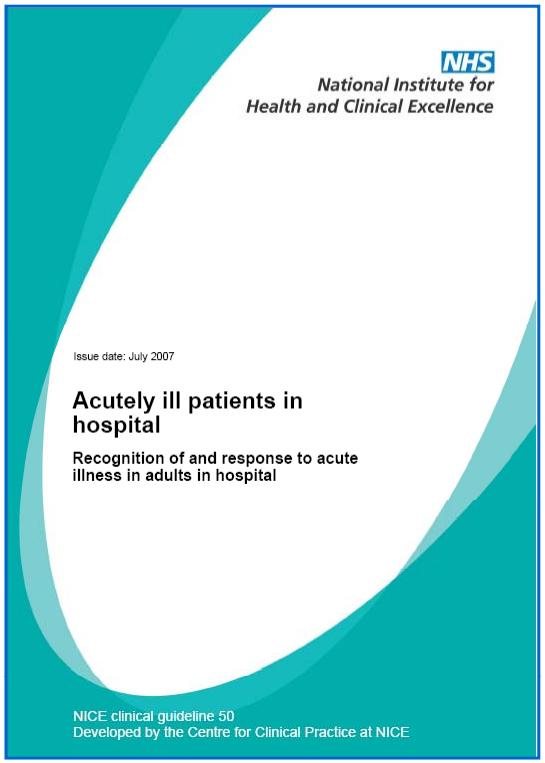
Smith GB. Resuscitation 2010; 81:1209-1211

Education



Smith GB. Resuscitation 2010; 81:1209-1211

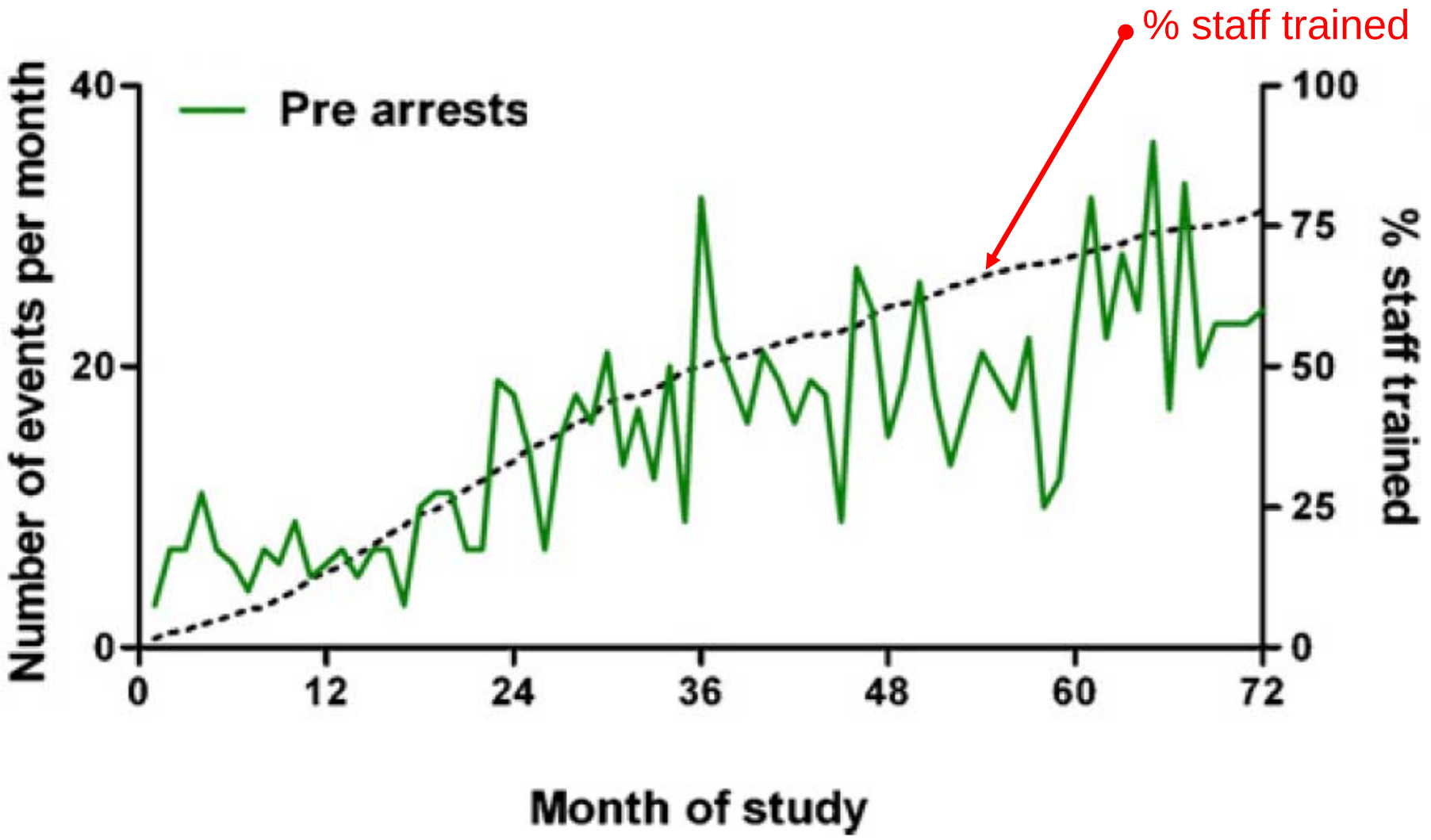
UK guidance on staff training re acutely ill patients in hospital



Staff caring for acutely ill adult patients in any acute hospital setting should:

- ❑ possess competencies in monitoring, recording and interpretation of vital signs
- ❑ be equipped to recognise deteriorating health and respond effectively to acutely ill patients, appropriate to the level of care they are providing.
- ❑ be provided with education and training to permit the development of such competencies and the competencies should be assessed

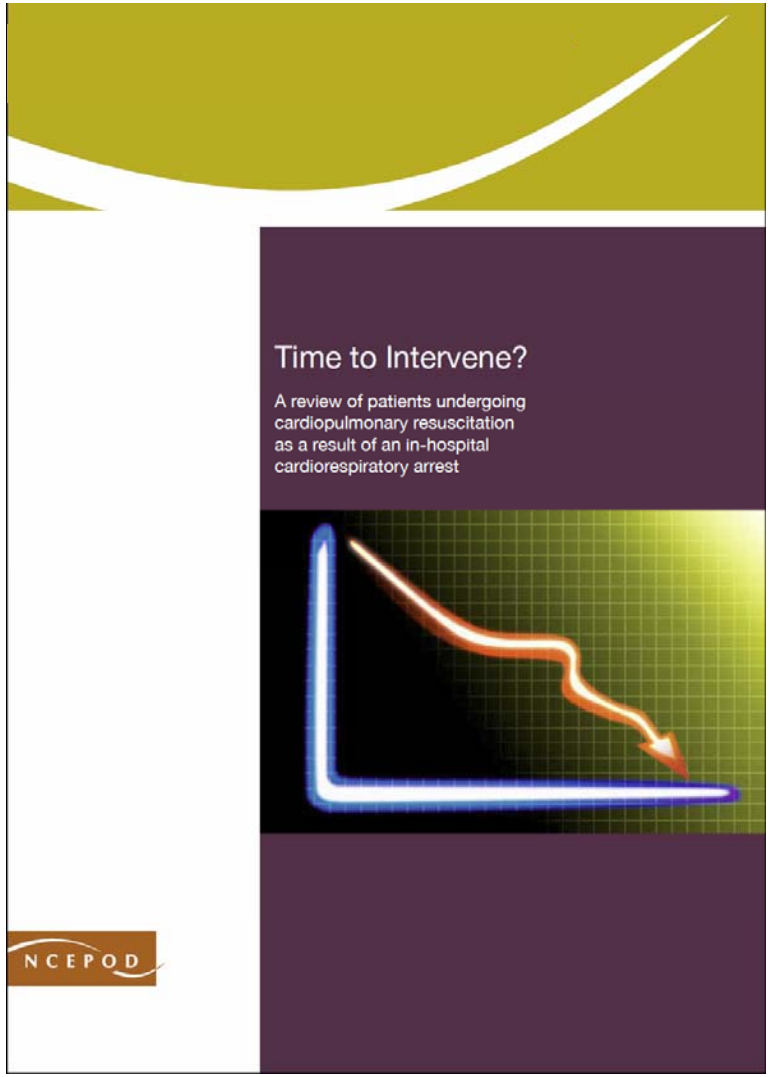
Education: critical mass of trained staff?



Spearpoint et al. Resuscitation 2009; 80:638-643

Competence of basic grade doctors

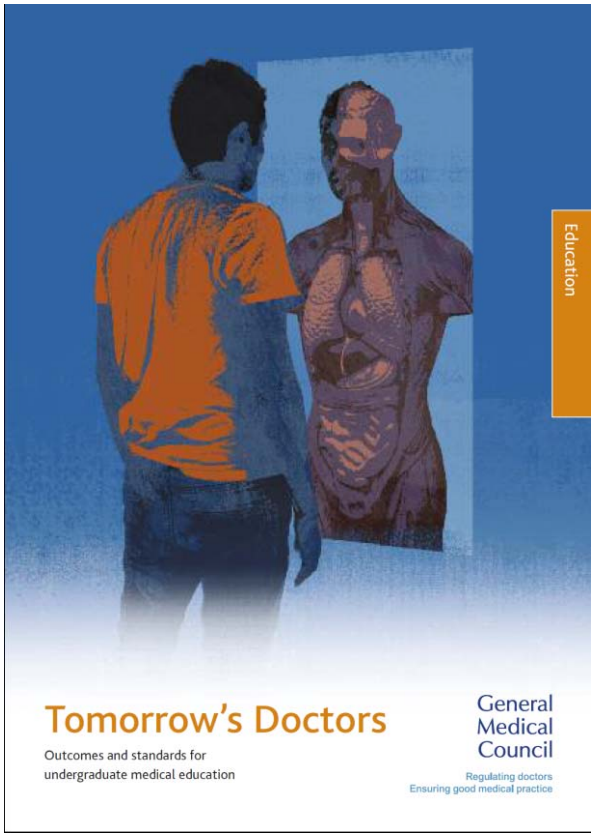
"...It may be that they...[basic grade doctors]...are being asked to assess and provide initial treatment for patients when they do not have the competency to do so. This raises the issue of training, to ensure that doctors are suitably skilled for the tasks they are required to undertake, and suitably supervised, to ensure that delivery of tasks is adequate, that staff are supported and that patient safety is maintained..."



NCEPOD. Time to Intervene? 2012

GMC's expectations of medical graduates

- Lists16 outcomes that medical students must achieve by the time they graduate



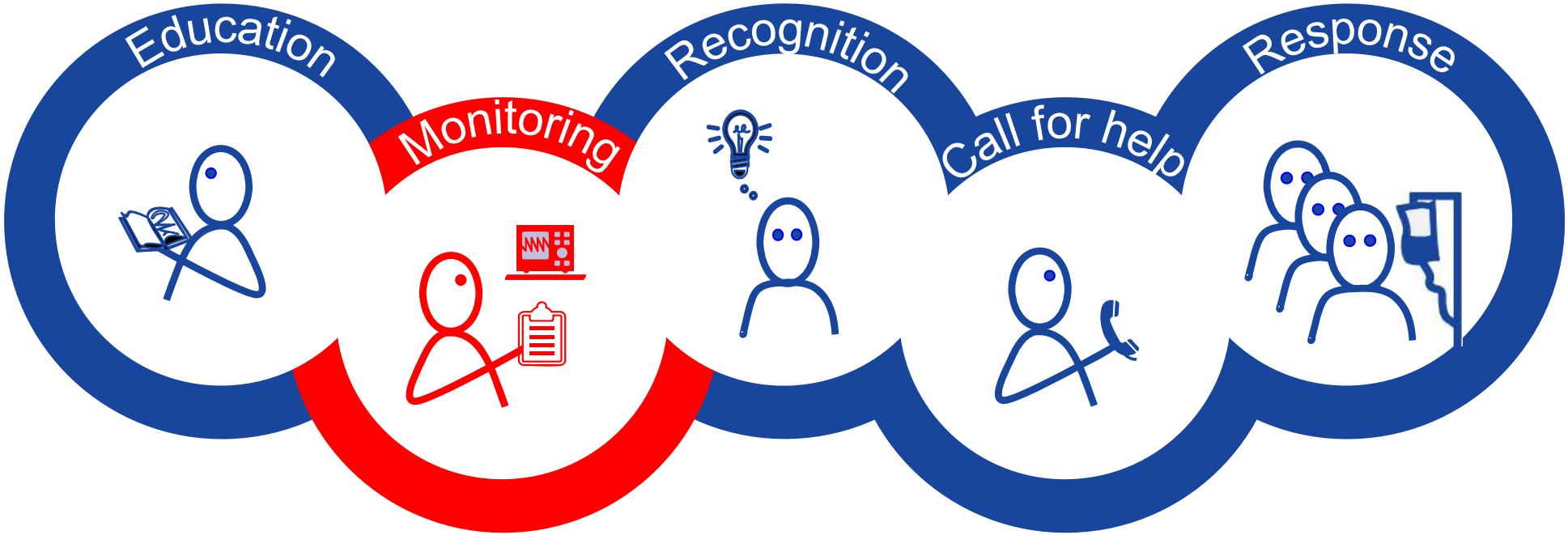
"Immediate care in medical emergencies"

1. Assess and recognise the severity of a clinical presentation and a need for immediate emergency care.
2. Diagnose and manage acute medical emergencies.
3. Provide basic first aid.
4. Provide immediate life support.
5. Provide cardio-pulmonary resuscitation or direct other team members to carry out resuscitation.

To ensure the future safety and care of patients, students who do not meet the outcomes set out in *Tomorrow's Doctors or are otherwise not fit to practise must not be* allowed to graduate with a medical degree.

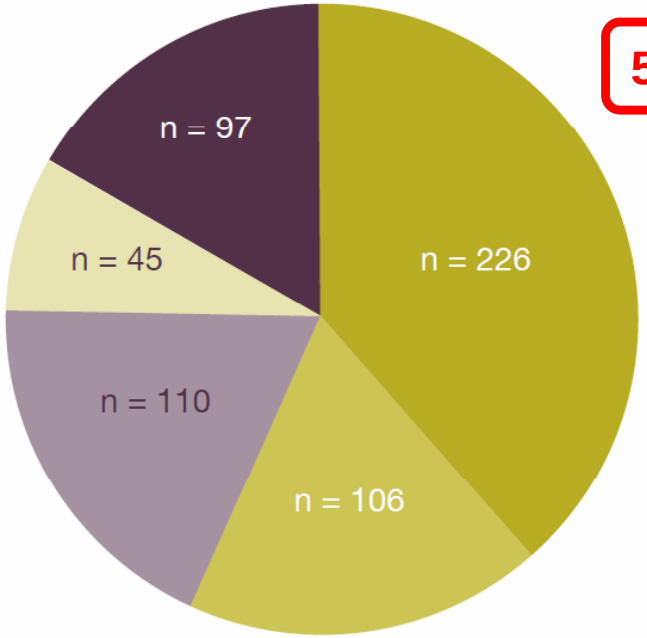
GMC. Tomorrow's Doctors 2009

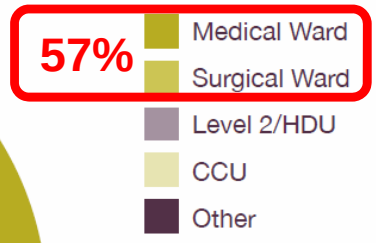
Monitoring

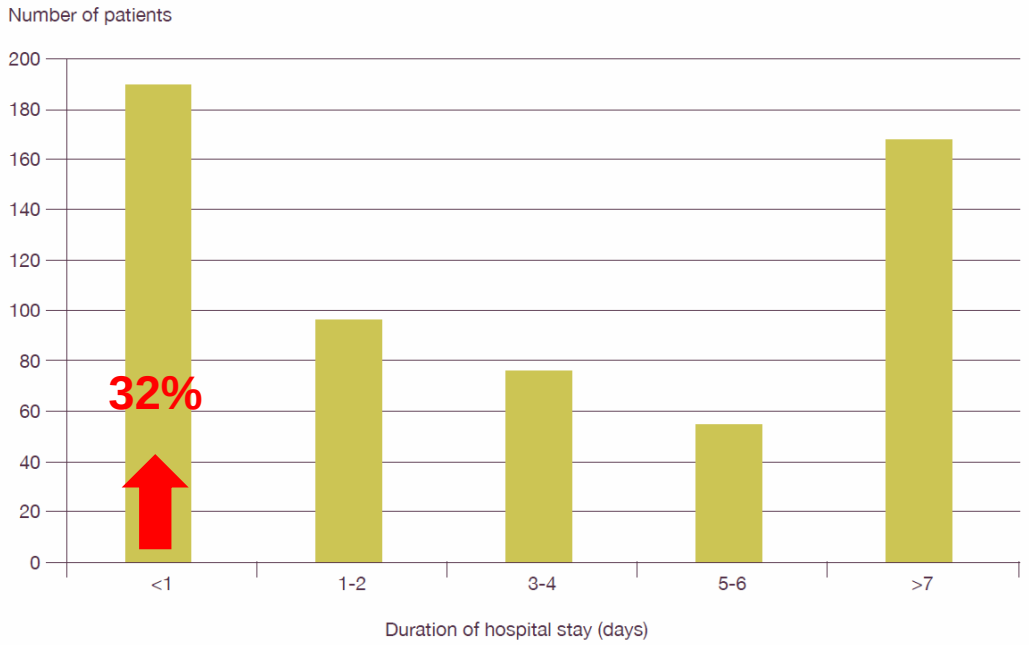


Smith GB. Resuscitation 2010; 81:1209-1211

Location pre-arrest





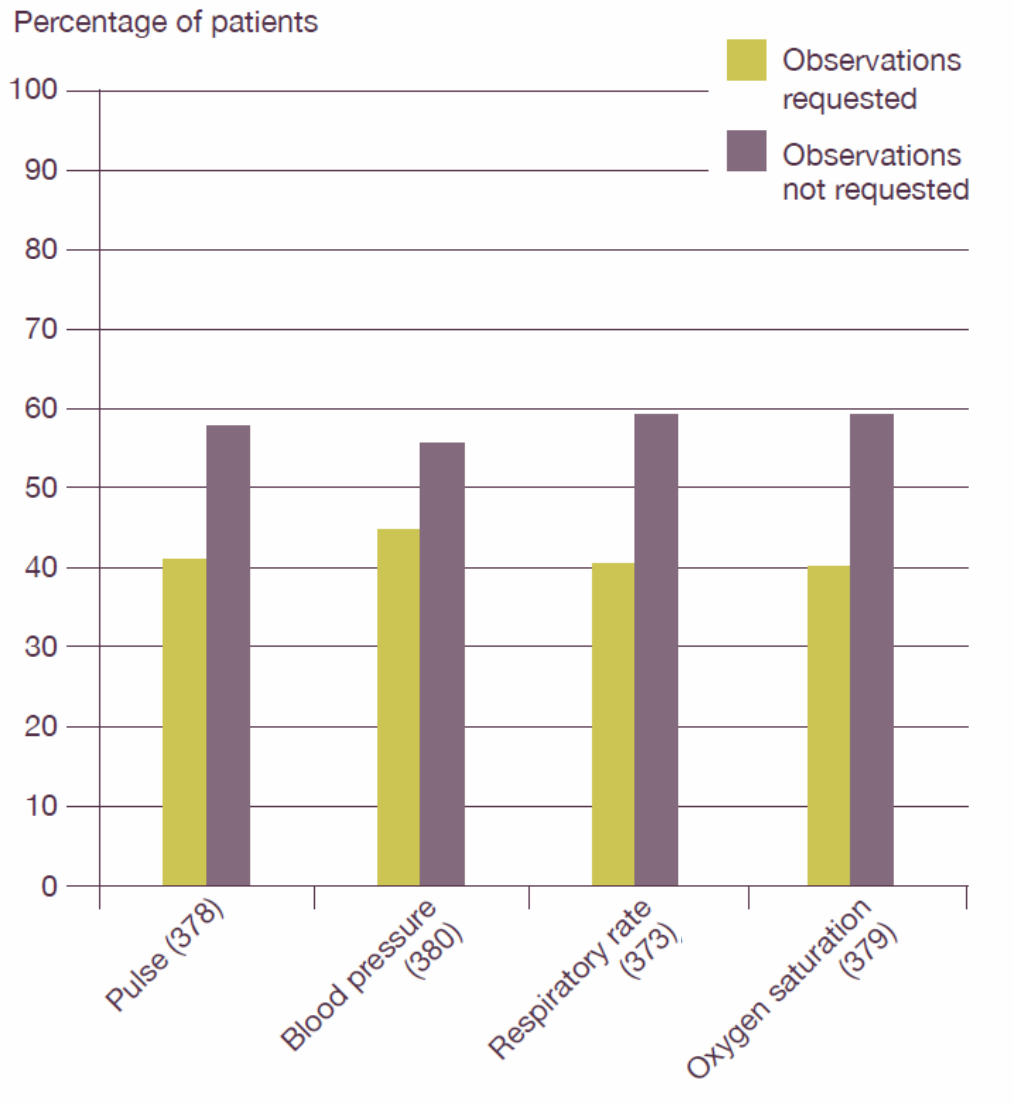


Appropriate ward	n	%
Yes	521	92.2
No	44	7.8
Subtotal	**565**	
Unknown	20	
Total	**585**	

Location	Total
Level 3 care	3
Level 2 care	13
Coronary care unit	8
Surgical ward	2
Medical ward	7
Other	10
Subtotal	**43**
Not answered	1
Total	**44**

56%

The detection of, and response to, patient deterioration



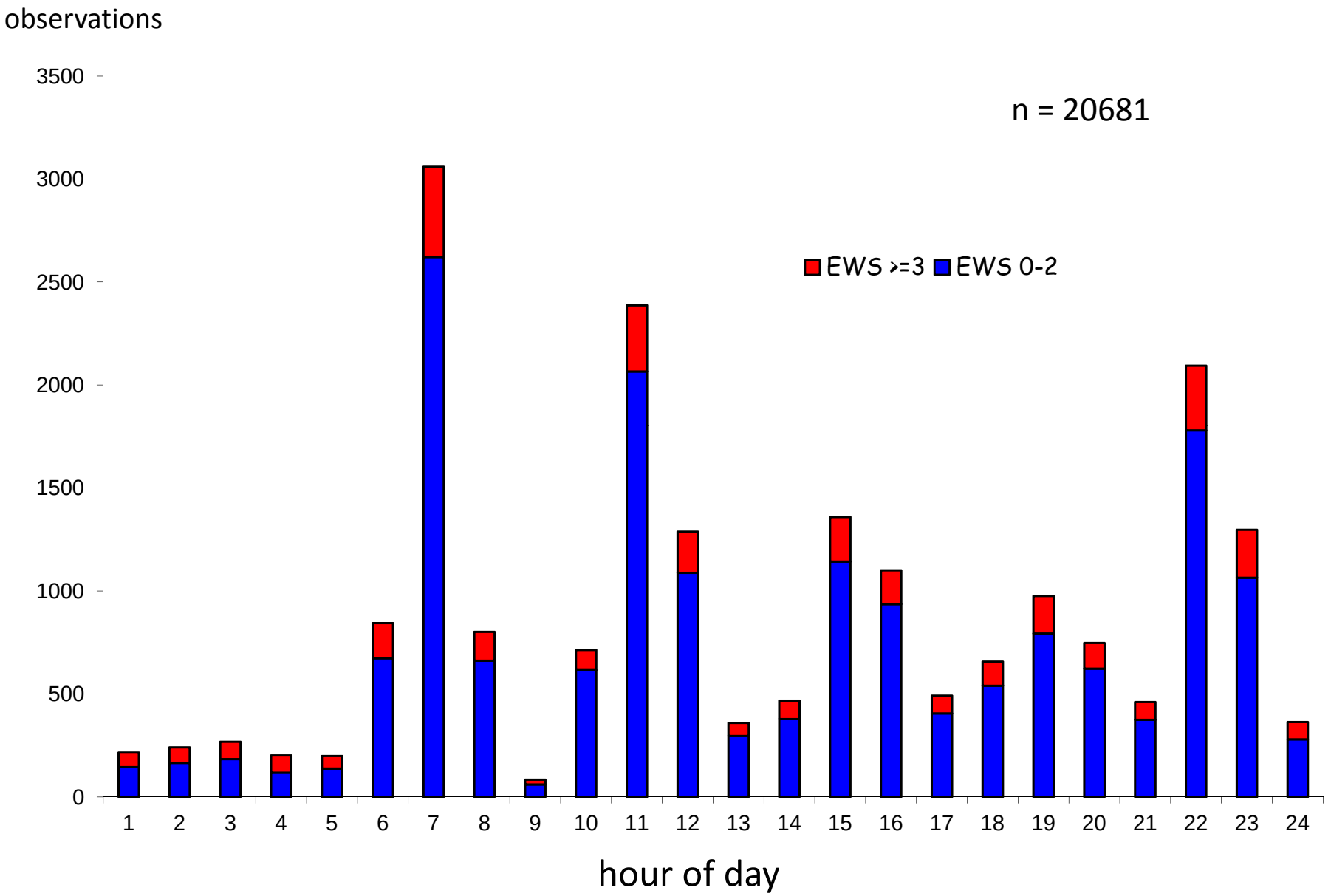
In most cases no monitoring plan was noted.

No observation frequency stated in 20-40% of cases, depending on the parameter considered)

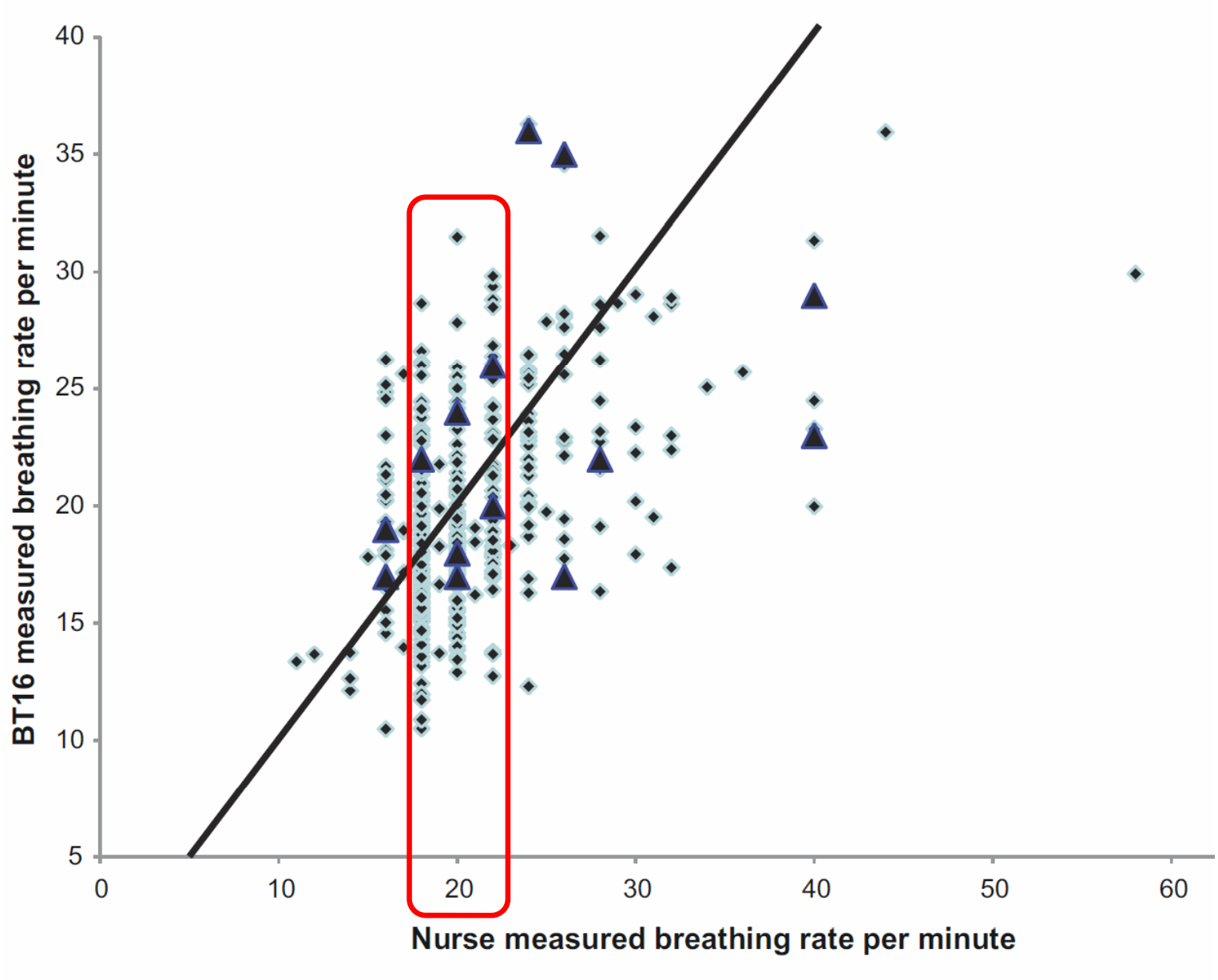
NCEPOD. Time to Intervene? 2012

Pattern of observations throughout 24 hour period

Excludes patient's vital signs first observation set

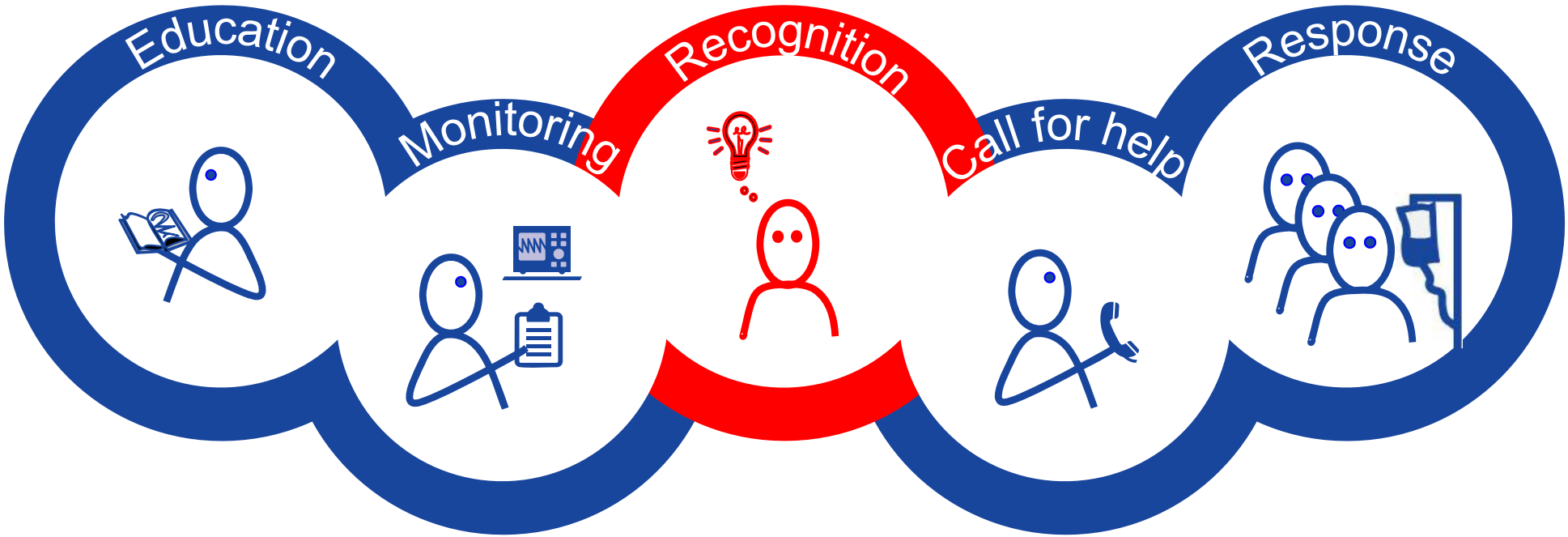


Nurse and machine measured breathing rates



Kellett et al. Resuscitation 2011;82:1381-1386

Recognition



Smith GB. Resuscitation 2010; 81:1209-1211

Early warning scores and escalation protocols

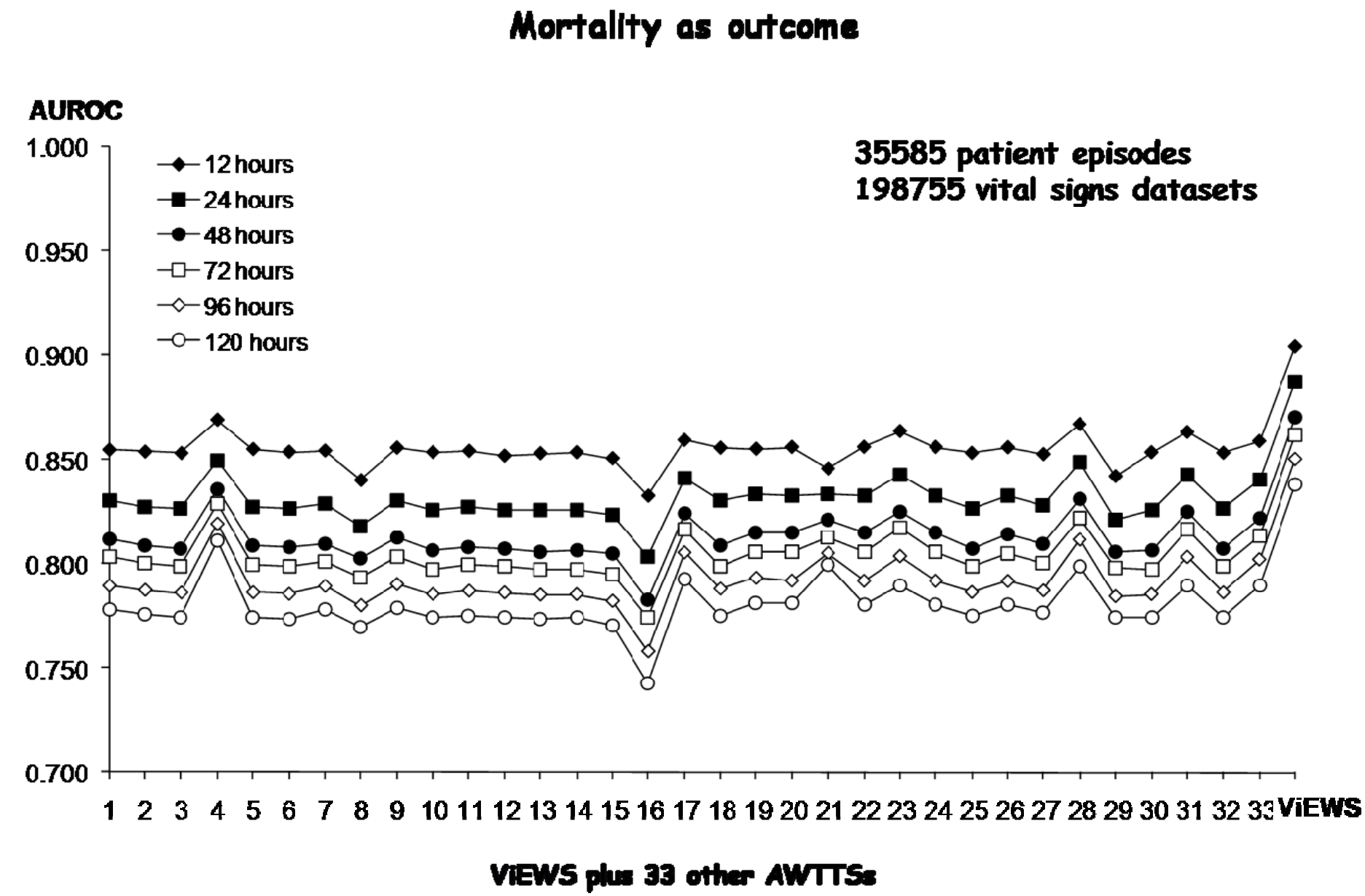
Early warning system was used	n	%
Yes	376	98.9
No	4	1.1
Subtotal	**380**	
Not Answered	3	
Total	**383**	

Early warning system linked to escalation protocols	n	%
Yes	365	97.9
No	8	2.1
Subtotal	**373**	
Not answered	3	
Total	**376**	

Policy (structure)
vs
Use (process)

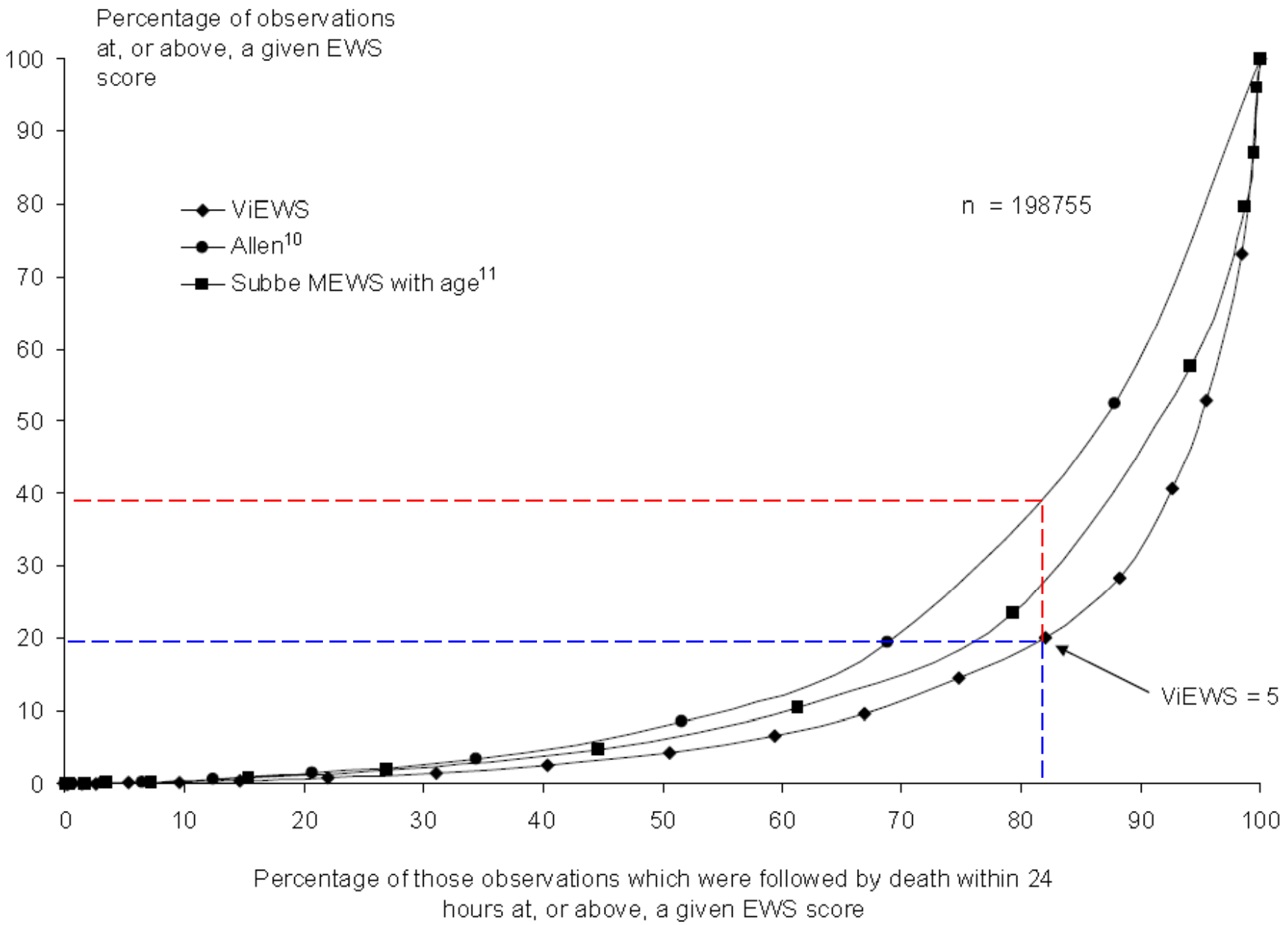
NCEPOD. Time to Intervene? 2012

Early Warning Scores: comparison of performance



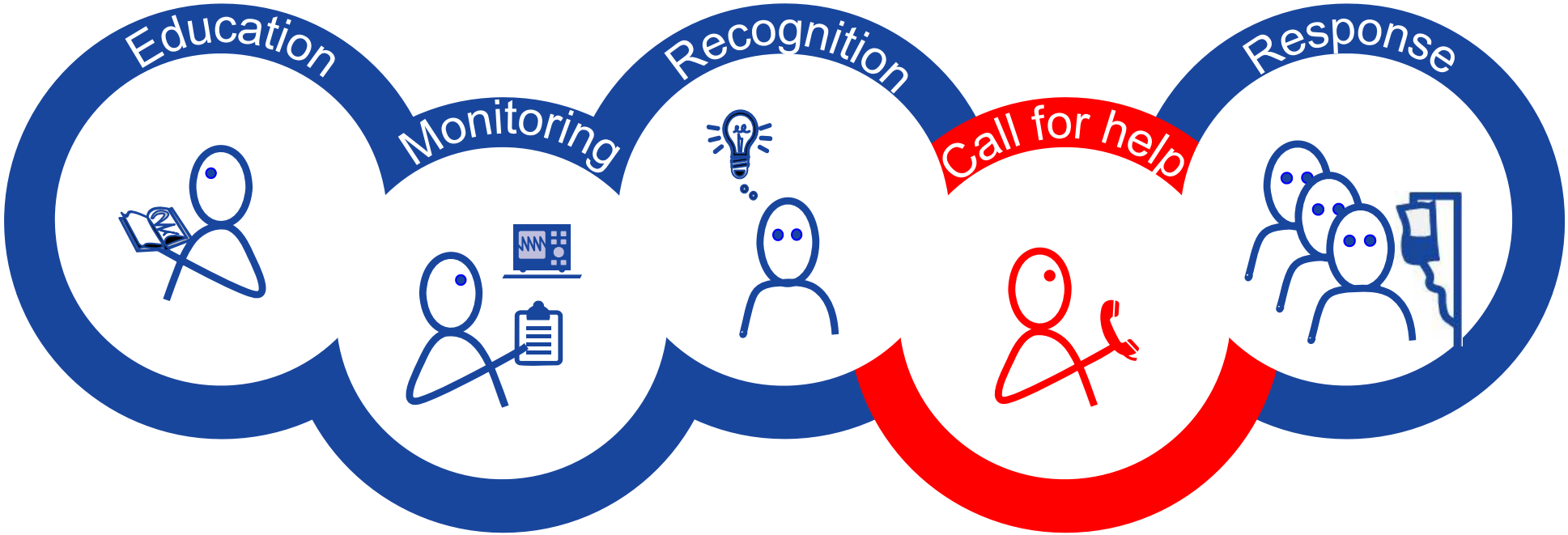
Prytherch et al. Resuscitation 2010; 81: 932–937

Early Warning Score efficiency chart



Prytherch et al. Resuscitation 2010; 81: 932–937

Call for help



Smith GB. Resuscitation 2010; 81:1209-1211

Why no response?

Warning signs were apparent	n	%
Yes	344	74.5
No	118	25.5
Subtotal	**462**	
Insufficient data	64	
Total	**526**	

The signs were:	Yes	%
Recognised	152	64.1
Acted on adequately	104	43.9
Communicated to appropriate senior doctors	106	44.7

?

Instructions recorded	n	%
Yes	85	21.0
No	320	79.0
Subtotal	**405**	
Insufficient data to assess	121	
Total	**526**	

Nurses' attitudes to Medical Emergency Team activation

	agreed or strongly agreed (%)	
	Jones 2006	Bagshaw 2010
I would call a MET on a patient I am worried about even if their vital signs are normal	56	48
If my patient fulfils the listed MET criteria but does not look unwell I would not make a MET call	16	7
When one of my patients is sick I call the covering doctor before calling a MET	72	77
If I cannot contact the covering doctor about my sick patient I call a MET	81	75
I am reluctant to call a MET on my patients because I will be criticised if they are not that unwell	10	15

Jones et al. Qual Saf Health Care 2006;15:427–432.
Bagshaw et al. Am J Crit Care 2010;19:74-83.

Factors affecting trainees' decisions to seek clinical support

"You are expected to make certain decisions by yourself at a certain stage of training and that you are really inconveniencing someone else by asking them, that would be used to judge your level of competence I guess"

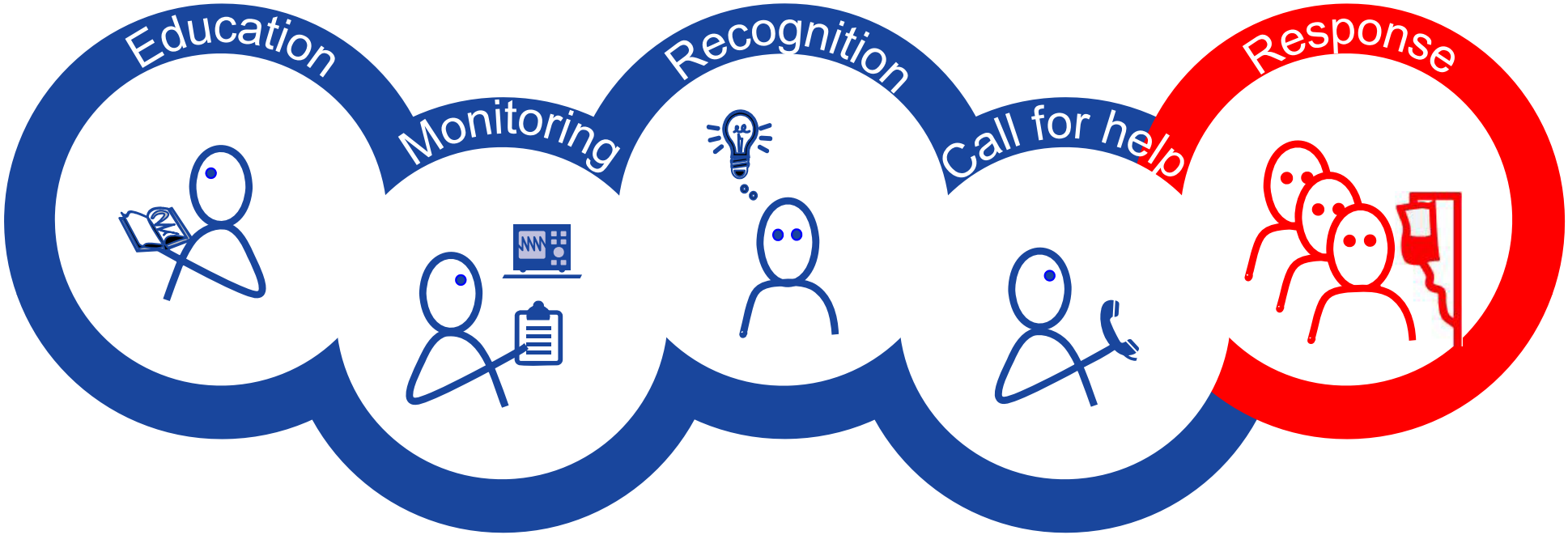
"it's not so hard to ask anything if the staff is standing right there, but if it is 1.30 in the morning and your resident is asleep . . . I think that has a big impact"

"You get a vibe from your staff very quickly on when or when you shouldn't ask for help. And some staff are very open and up-front: '*call me for anything*'— very approachable. And some staff you get the impression that if you call them in the middle of the night it's going to be a huge deal and they'll be talking in the morning and be sort of like '*I can't believe him. He called in the middle of the night*' . . ."

"I want to look like I'm independent and I can handle questions on my own and I don't need to go to the attending for every little thing unless it's big. . . [because] you want to impress and you want to have good things said about you at the end of your rotations"

Kennedy et al. BMJ 2009;338:b128

Response



Smith GB. Resuscitation 2010; 81:1209-1211

Response

- FY1 & FY2 doctor
- Specialist Registrar
- ICU team
- Medical Emergency Teams
- Critical Care Outreach Teams
- Patient at Risk Teams
- Critical Care Liaison Service
- Nurse Emergency Team
- Intensive Care Liaison Nurse

Rationale for early response: delays in MET calls

Panel: MET calling criteria

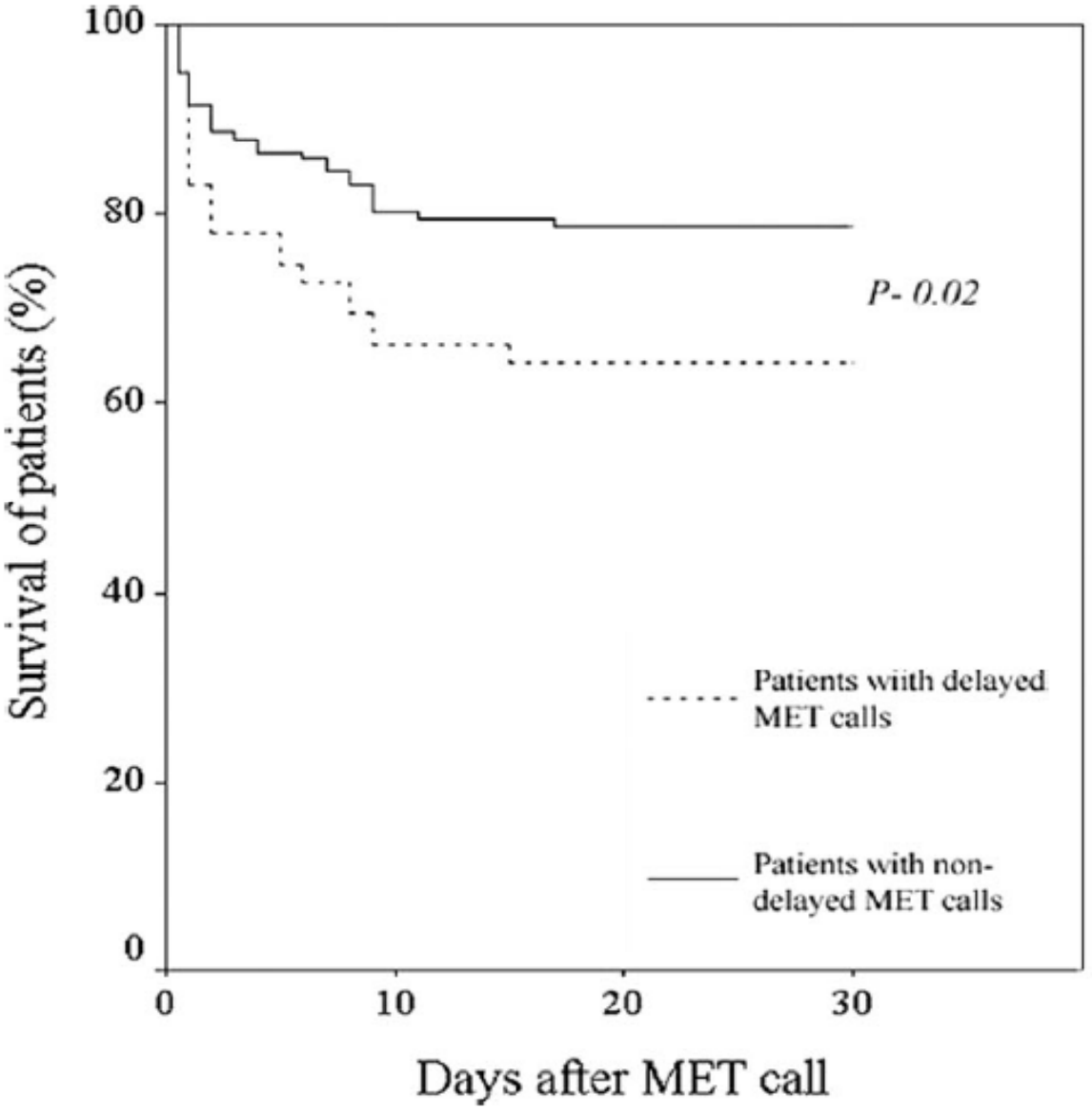
Airway
If threatened

Breathing
All respiratory arrests
Respiratory rate <5 breaths per min
Respiratory rate >36 breaths per min

Circulation
All cardiac arrests
Pulse rate <40 beats per min
Pulse rate >140 beats per min
Systolic blood pressure <90 mm Hg

Neurology
Sudden fall in level of consciousness
(fall in Glasgow coma scale of >2 points)
Repeated or extended seizures

Other
Any patient you are seriously worried about that does not fit the above criteria



- 59/200 MET calls were delayed
- In-hospital mortality: 37% with delayed calls; 22% of those without delay (p=0.025).

Downey et al. CCM 2008; 477-481

Summary

- recognising and responding to patient deterioration are complex issues influenced by:
  - education
  - frequency of observations
  - completeness of observation sets
  - knowledge of meaning of abnormal values
  - design of vital signs charts
  - the impact of EWS sensitivity & specificity
  - human factors
  - decisions to call for assistance
  - nature of the response
  - timing of response
- there remains much room for improvement