5. Patient observations and review criteria

Observation recording

Early recognition relies on the correct physiological observations being performed at an interval appropriate to the condition of the patient. 439 sets of notes of deceased patients were available for analysis. Table 1 shows that it was unusual for a request to be made for the type and frequency of physiological observations. This is a potential source of error and delayed recognition of clinical deterioration.

Table 1. Type and frequency of physiological observations requested for patients

	Number of patients by requested frequency of observations				Total *n* = *439*					
	Hourly	**Four hourly**	**Other**	**Not specified**	**Observations requested**	***(%)***	**Not requested**	***(%)***	**Unknown**	***(%)***
Pulse	6	1	8	13	**28**	***(6)***	**337**	***(77)***	**74**	***(17)***
Blood pressure	6	2	9	16	**33**	***(8)***	**335**	***(76)***	**71**	***(16)***
Respiratory rate	2	2	7	7	**18**	***(4)***	**345**	***(79)***	**76**	***(17)***
Urine output	25	0	8	29	**62**	***(14)***	**303**	***(69)***	**74**	***(17)***
Fluid balance	5	1	10	40	**56**	***(13)***	**306**	***(70)***	**77**	***(17)***
Central venous pressure	4	0	1	14	**19**	***(4)***	**335**	***(76)***	**85**	***(20)***
SpO_2	6	2	8	14	**30**	***(7)***	**334**	***(76)***	**75**	***(17)***
Other	4	0	6	2	**12**	***(3)***	**355**	***(81)***	**72**	***(16)***

However, whilst it is rare to document a physiological observation plan it is clear that nursing staff did perform observations. Table 2 illustrates the total number of observation points for each parameter in the three days prior to ICU admission. This is expressed as observations per patient per day. Table 3 shows the number of patients in hospital at each timepoint prior to ICU admission. As expected, the rate of observations per patient per day increased, as ICU referral became closer, except for the day of referral to ICU. It is most likely that the trend did not continue for the day of referral to ICU due to the proportionately large number of patients arriving in hospital on that day, giving a large number of incomplete days on which to base the rate. It is clear that pulse and blood pressure and temperature were most frequently recorded and that respiratory rate was the least recorded variable. This is especially worrying, as respiratory rate has been shown to be an early and sensitive indicator of deterioration [5]. This has been shown in all inpatients irrespective of specialty [26] and has been validated in acute medical admissions [27].

The use of pulse oximetry monitoring has increased considerably during recent years. As can be seen in this study, it was used with greater frequency than respiratory rate monitoring. Whilst pulse oximetry can add additional information it is also open to misinterpretation [28]. This study revealed that junior doctors and staff nurses were untrained in pulse oximetry, lacked knowledge of basic principles, and made serious errors in interpretation of readings. In addition, there is a common misconception that pulse oximetry measurements obviate the need for respiratory rate monitoring.

Table 2. Observations per patient per day for the three days prior to ICU admission		
Observation	**Day**	**Rate per patient**
Pulse	Three days before referral to ICU	3.17
	Two days before referral to ICU	4.24
	One day before referral to ICU	4.36
	Day of referral to ICU	3.66
Blood pressure	Three days before referral to ICU	3.87
	Two days before referral to ICU	4.72
	One day before referral to ICU	5.09
	Day of referral to ICU	3.66
Respiratory rate	Three days before referral to ICU	1.70
	Two days before referral to ICU	2.48
	One day before referral to ICU	2.62
	Day of referral to ICU	2.12
Temperature	Three days before referral to ICU	2.93
	Two days before referral to ICU	3.34
	One day before referral to ICU	3.29
	Day of referral to ICU	1.49
Oxygen saturation	Three days before referral to ICU	2.54
	Two days before referral to ICU	3.71
	One day before referral to ICU	3.86
	Day of referral to ICU	3.20

Table 3. Number of patients in hospital	
Patients present in hospital (Answers may be multiple)	**Number of patients**
Three days before referral to ICU	109
Two days before referral to ICU	128
One day before referral to ICU	190
Day of referral to ICU	356