essential element 1

MEASUREMENT AND DOCUMENTATION OF OBSERVATIONS

measurement and documentation of observations

the problem

Clinicians do not always measure the appropriate observations to identify clinical deterioration.

Patients in acute care settings often go for extended periods without observations being monitored.

Clinicians sometimes fail to recognise and respond appropriately to abnormal observations.

goals of this essential element

Patients have appropriate physiological observations and assessments monitored to recognise and respond to clinical deterioration.

Patients' physiological observation and assessment monitoring needs are clearly communicated among members of the healthcare team.

Abnormal physiological observations are easily identified from observation charts.

Patients' physiological observations can be tracked over time, with clear triggers for when care should be escalated.

what you need to do

Measure and document core physiological observations with appropriate frequency and for the appropriate duration of the patient's admission.

Document a monitoring plan for each patient.

Use observation charts designed using human factors principles that incorporate track and trigger systems.

common terms used in this essential element

Human factors: 'The environmental, organisational and job factors of humans interacting with systems, as well as the physiological and psychological characteristics which influence behaviour at work.'[1]

Monitoring plan: a plan outlining the minimum observation and assessment requirements for a patient in an acute care setting. May be an individualised plan documented in the patient record or a standardised policy or pathway applying to a group of patients. This includes the required frequency (times per day) and duration (number of days) of physiological observation monitoring.

Observations: the core physiological observations required to identify clinical deterioration (blood pressure, heart rate, level of consciousness, oxygen saturation, respiratory rate and temperature).

Track and trigger systems: systems designed to provide clinicians with an objective decision-making process for recognising and responding to altered physiological observations.[2]

consensus statement recommendations

essential element 1: measurement and documentation of observations

1.1 Observations should be taken on all patients in acute care settings.

1.2 Observations should be taken on patients at the time of admission or initial assessment.

1.3 For every patient, a clear monitoring plan should then be developed that specifies the physiological observations to be recorded and the frequency of observations, taking into account the patient's diagnosis and proposed treatment.

1.4 The frequency of observations should be consistent with the clinical situation of the patient. For the majority of patients in an acute health care facility, observations should be taken at least once per eight hour shift. In some clinical circumstances more frequent or less frequent observations will be appropriate and this should be documented in the monitoring plan.

1.5 The frequency of observations should be reconsidered and possibly modified according to changes in clinical circumstances.

1.6 Physiological observations should include:

- respiratory rate
- oxygen saturation
- heart rate
- blood pressure
- temperature
- level of consciousness.

In some circumstances, and for some groups of patients, some observations will need to be measured more or less frequently than others, and this should be specified in the monitoring plan.

1.7 The minimum physiological observations should be documented on a structured tool such as an observation chart.

1.8 Observation charts should display information in the form of a graph. An observation chart should include:

- a system for tracking changes in physiological parameters over time
- thresholds for each physiological parameter or combination of parameters that indicate abnormality
- information about the response or action required when thresholds for abnormality are reached or deterioration identified
- the potential to document the normal physiological range for the patient.

1.9 Clinicians may choose to document other observations and assessments to support timely recognition of deterioration. Examples of additional information that may be required include fluid balance, occurrence of seizures, pain, chest pain, respiratory distress, pallor, capillary refills, pupil size and reactivity, sweating, nausea and vomiting, as well as additional biochemical and haematological analyses.

STEP 1 roles and responsibilities

Who is responsible?
How does this element apply to your role(s)?
What clinical areas does this element apply to?

A variety of health professionals are involved in measuring and documenting observations to recognise and respond to clinical deterioration. To change practice and improve systems, health professionals need to determine who will be responsible for undertaking the tasks required for this essential element.

The frequency of observations should be consistent with the clinical situation of the patient. For the majority of patients in an acute health care facility, observations should be taken at least once per eight hour shift. In some clinical circumstances more frequent or less frequent observations will be appropriate and this should be documented in the monitoring plan.

table 2 ROLES AND RESPONSIBILITIES RELATING TO MEASURING AND DOCUMENTING OBSERVATIONS

	People involved in measuring and documenting observations	
Clinical areas involved in measuring and documenting observations	**Role**	**Responsibility**
All acute care areas of a facility need to have systems in place to ensure observations and assessments are measured and documented. This includes: • emergency departments • intensive care units or high dependency units • general wards and specialty areas • maternity units • paediatric units • mental health units • operating theatre recovery units • other clinical areas where patients receive acute care treatments	Consumers, patients, families and carers	• Alert clinicians to any worries or concerns • Participate in developing observation and monitoring policies
	Non-clinical workforce	• Alert clinicians to abnormal observations and assessments, and any worries or concerns
	Clinical workforce	• Follow agreed practices for measuring and documenting physiological observations • Participate in education • Participate in evaluating practices and policies • Ensure agency and locum clinicians are aware of observation practices and policies before delegating care to them
	Educators	• Develop education programs to promote understanding of physiological observations (normal and abnormal) • Train clinicians on observation practices and policies and the significance of abnormal observations • Participate in evaluating observation practices and policies
	Health professionals with responsibility for policy or quality improvement	• Develop policies and procedures for: – minimum standards for measuring physiological observations – minimum standards for measuring other observations and assessing specific patient groups (e.g. maternity, mental health) – documenting an individualised monitoring plan for each patient • Develop data measures and undertake audits of observation and assessment practices
	Health service managers	• Develop agreed practices and policies for measuring physiological observations with appropriate frequency and duration • Train clinicians on observation monitoring practices and policies and the significance of abnormal observations • Lead and support review of staffing levels and clinical supervision, if these affect observation monitoring practices • Participate in evaluating observation monitoring practices • Ensure agency and locum clinicians are aware of observation monitoring practices and policies before delegating care to them

table 2 ▸ CONTINUED...

	People involved in measuring and documenting observations	
Clinical areas involved in measuring and documenting observations	**Role**	**Responsibility**
	Health service boards, executives and owners	• Assign responsibility, personnel and resources to support development, implementation and evaluation of: – practices and policies for measuring physiological observations – training on observation policies and practices – barriers to better monitoring practices, such as inadequate equipment and staffing levels • Support managers to implement protocols and policies in their areas

implementation tip

Developing systems for monitoring and documenting observations

- To improve systems for measuring and documenting observations, medical, nursing and allied health teams need to agree on the frequency and duration of observations and assessments, and on processes to communicate and modify observation frequencies, if required. Be sure to seek representation from these different clinical teams when developing systems for measuring and documenting observations
- Clinicians are often concerned about disturbing patients to conduct observations and assessments at night. Remember to work with night staff when developing observation measurement policies. By stimulating interest and clarifying concerns in different clinical areas, you can promote a culture that is conducive to change
- Observations are often documented on a variety of charts. For example, physiological observations may initially be recorded on a general observation chart, but may then be recorded on a blood observation chart when a patient receives blood products. Collect all charts used to document observations before starting work on this essential element. This will help you identify clinical areas and practices that need to change
- National clinical guidelines can help identify observations and assessments that are needed for specific clinical conditions. Identify any guidelines that are relevant to your clinical area.

STEP 2 self-assessment and planning tool

Use the self-assessment tool to identify gaps in your systems for measuring and documenting observations and develop an action plan.

Prioritise your changes.

The self-assessment and planning tool has been designed to assess one clinical area, or an entire facility's current practice, in relation to this essential element. A modifiable electronic version of this tool, and other supporting tools to help answer the self-assessment questions, are available on the Commission's web site.

The action plan for this essential element begins on page 27. Follow the instructions in the self-assessment and planning tool to complete the action plan.

NAME OF WARD OR AREA BEING ASSESSED:

task 1 **Measure and document core physiological observations with appropriate frequency and duration**		**Data or documentation that proves the criteria have been met** **Type of data or name of document**
AGREEMENT Are you measuring the core physiological observations that identify clinical deterioration (i.e. temperature, heart rate, blood pressure, respiratory rate, oxygen saturation, level of consciousness)?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of agreement' in your action plan	
PROCESS OR POLICY Do you have guidelines and policies outlining the minimum frequencies and duration of core physiological observation measurements in all acute care areas?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of process/ policy' in your action plan	
RESOURCES Have you got enough equipment to measure physiological observations?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of resources' in your action plan	
Do you have enough clinicians and is there appropriate clinical supervision?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of resources' in your action plan	
KNOWLEDGE Do clinicians understand the significance of core physiological observations?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of knowledge' in your action plan	
SYSTEMS TO SUPPORT MONITORING AND EVALUATION Do you audit to ensure complete sets of core physiological observations are measured?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of monitoring and evaluation' in your action plan	
Do you audit to ensure core physiological observations are measured with appropriate frequency and duration?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of monitoring and evaluation' in your action plan	
Do you audit clinicians' practice regarding the techniques of physiological observation measurement?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of monitoring and evaluation' in your action plan	

Where is it kept?	Are these policies/processes/ resources operating as planned? Does your data demonstrate effective operation at all times?
	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan
	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan
	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan
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	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan

NAME OF WARD OR AREA BEING ASSESSED:

task 2 Document a monitoring plan for each patient		Data or documentation that proves the criteria have been met Type of data or name of document
AGREEMENT Have you reached agreement on additional observations and assessments for specific patient groups (e.g. renal, respiratory, maternity)?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of agreement' in your action plan	
PROCESS OR POLICY Do you have policies or guidelines outlining additional observations and assessments for specific patient groups?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of process/ policy' in your action plan	
Do you have a process for documenting a clear monitoring plan for each patient in all areas?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of process/ policy' in your action plan	
RESOURCES Is there enough equipment to measure additional observations and assessments?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of resources' in your action plan	
KNOWLEDGE Do clinicians understand the significance of observations and assessments for specific patient groups and treatments?	☐ YES ▸ fill in next two columns ☐ NO ▸ tick 'Lack of knowledge' in your action plan	
Are clinicians educated on the process for developing a clear monitoring plan for each patient?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of knowledge' in your action plan	
SYSTEMS TO SUPPORT MONITORING AND EVALUATION Do you audit to ensure each patient has a documented monitoring plan?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of monitoring and evaluation' in your action plan	
Do you audit the content of monitoring plans to ensure they meet policy or guideline requirements?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of monitoring and evaluation' in your action plan	

Where is it kept?	Are these policies/processes/ resources operating as planned? Does your data demonstrate effective operation at all times?
	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan
	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan
	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan
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	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan
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	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan
	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan

NAME OF WARD OR AREA BEING ASSESSED:

⊙ task 3 Use observation charts designed using human factors principles that incorporate a track and trigger system		Data or documentation that proves the criteria have been met Type of data or name of document
AGREEMENT Have you decided on the type of track and trigger system to use?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of agreement' in your action plan	
PROCESS OR POLICY Have trigger thresholds and responses been developed?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of process/ policy' in your action plan	
RESOURCES Has your track and trigger system been incorporated into an observation chart designed using human factors principles?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of resources' in your action plan	
KNOWLEDGE Do clinicians know how to use these charts?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of knowledge' in your action plan	
SYSTEMS TO SUPPORT MONITORING AND EVALUATION Do you audit clinical areas to identify if the correct charts are being used?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of monitoring and evaluation' in your action plan	
Do you monitor incidents and critical events to identify problems with observation charts?	☐ YES ▸ Fill in next two columns ☐ NO ▸ Tick 'Lack of monitoring and evaluation' in your action plan	

Where is it kept?	Are these policies/processes/ resources operating as planned? Does your data demonstrate effective operation at all times?
	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan
	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan
	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan
	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan
	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan
	YES ▸ WELL DONE! Continue to monitor NO ▸ Why not? What are the barriers? Add these to your action plan

action plan ▸ MEASUREMENT AND DOCUMENTATION OF OBSERVATIONS

NAME OF WARD OR AREA BEING ASSESSED:

what do you need to do?		how will you do it?
Task not yet achieved	Why has this task not been achieved (barriers)? What actions are needed?	Go to the recommended section of this guide for information on tasks and actions. List the tools and resources from the guide to address this gap here. Also consider other resources that may be available to you to address this gap.
task 1 Measure and document core physiological observations with appropriate frequency and duration	☐ Lack of agreement ▸ DECIDE ▸ p33 ☐ Lack of process/policy ▸ DEVELOP ▸ p34 ☐ Lack of resources ▸ RESOURCE ▸ p36 ☐ Lack of knowledge ▸ EDUCATE ▸ p38 ☐ Lack of monitoring and evaluation ▸ EVALUATE ▸ p40	
OTHER POSSIBLE BARRIERS:		
task 2 Document a monitoring plan for each patient	☐ Lack of agreement ▸ DECIDE ▸ p44 ☐ Lack of process/policy ▸ DEVELOP ▸ p45 ☐ Lack of resources ▸ RESOURCE ▸ p47 ☐ Lack of knowledge ▸ EDUCATE ▸ p48 ☐ Lack of monitoring and evaluation ▸ EVALUATE ▸ p49	
OTHER POSSIBLE BARRIERS:		
task 3 Use observation charts designed using human factors principles that incorporate a track and trigger system	☐ Lack of agreement ▸ DECIDE ▸ p54 ☐ Lack of process/policy ▸ DEVELOP ▸ p56 ☐ Lack of resources ▸ RESOURCE ▸ p57 ☐ Lack of knowledge ▸ EDUCATE ▸ p60 ☐ Lack of monitoring and evaluation ▸ EVALUATE ▸ p61	
OTHER POSSIBLE BARRIERS:		

OTHER COMMENTS AND PLANS:

Use the information from the self-assessment and planning tool to complete the action plan. The action plan links the barriers identified by the self-assessment and planning tool with specific actions, tools and resources to address them.

Who will be responsible?	When will this happen? Consider undertaking actions that are low cost, easy to implement and support meeting the *National safety and quality health service standards* first.

STEP 3 information and resources

Use the information and resources in this guide to help implement your action plan.

For each task, the following actions may be required: Decide, Develop, Resource, Educate and Evaluate

Each of the tasks for this essential element is discussed in detail in this section. Each task includes a brief summary of its importance and a series of actions that can be taken to complete it. Links to resources are included in Appendix C and additional tools to support implementation are available on the Commission's web site.

key tasks
for measurement and documentation of observations

task 1
Measure and document core physiological observations with appropriate frequency and duration

task 2
Document a monitoring plan for each patient

task 3
Use observation charts designed using human factors principles that incorporate a track and trigger system

why this task is important

This task is needed because:

- physiological observations play a significant role in detecting clinical deterioration; abnormalities may occur early or late in the deterioration process, or at any time during a patient's acute hospital admission
- correct observations to identify clinical deterioration are not always measured
- patients in acute care settings often go for prolonged periods without having physiological observations measured.

Several factors contribute to observations not being measured or documented in acute care areas, including:[3]

- no clear agreement on the correct physiological observations to identify clinical deterioration
- lack of research and guidelines to guide optimal frequencies and duration
- poor communication of patient monitoring needs among healthcare teams
- differences in clinical judgement
- varying views on the importance of measuring physiological observations
- fluctuating staffing levels.

Multiple studies and adverse events have shown that patients in acute care settings often go for prolonged periods without having physiological observations measured.[4–6] This can mean that clinical deterioration may not be recognised, and treatment may be delayed.

learning from coronial inquests

The importance of regular observations

Vanessa Anderson was a 16-year-old girl admitted to hospital suffering a closed head injury. She had been in considerable pain and received multiple doses of opioid medications, which the coroner determined led to her death from a respiratory arrest.

'Observations were due again at 4:00 am; however, the nurse decided not to do these observations because Vanessa had been neurologically unchanged when she conducted the observations at around 2:00 am. At around 5:30 am the nurse entered Vanessa's room and found her unresponsive. An emergency was called and CPR administered. The treatment was unsuccessful and Vanessa was certified as being Life Extinct at 6:35 am.'[7]

It is common practice to reduce the frequency of observation monitoring after a patient has been in hospital for several days, or as a patient is nearing discharge. However, this practice may result in clinical deterioration going unrecognised, as its occurrence is difficult to predict. Clinical deterioration can occur at any time during a patient's hospital admission.[8]

Hospitalisation places patients at risk of complications other than those related to their presenting diagnosis (e.g. pulmonary embolism, hospital-acquired infections). Ongoing measurement of observations and assessments is therefore necessary to detect clinical deterioration and other possible complications.

The optimal frequency and duration for measuring physiological observations is not known. Frequencies often vary due to differences in an individual clinician's judgement, poor communication among teams, varying views on the importance of observations and lack of guidelines to inform practice.[3,9–11]

practice point

Deaths in acute care

An audit of 778 deaths across three acute care hospitals in Australia identified that death occurred:[8]

- on the day of admission 10.3%
- on day 1 16.6%
- after 2–7 days 33.7%
- after 8–14 days 16.6%
- after more than 14 days 22.9%

Of these deaths, 29.4% occurred without a treatment-limiting decision such as a 'do not resuscitate' order in place, highlighting the potential for unexpected clinical deterioration.

practice point

Variations in the frequency of physiological observation measurement

A 700-bed specialist tertiary referral hospital in Australia surveyed nurses to examine the beliefs and current practices related to observation measurement.

The survey results (shown below) identified 22 reported variations in physiological observation monitoring times when it was specified that observations were to be measured four times a day. Several nurses working on the same ward reported using different frequencies.

The results demonstrate that prolonged periods of time can occur between measurements of observations, and that variations in practice currently exist.

1.	06:00	10:00	16:00	20:00	
2.	06:00	11:00	16:00	21:00	
3.	06:00	11:00	16:00	22:00	
4.	06:00	12:00	18:00	22:00	12-hour gap
5.	06:00	10:00	16:00	22:00	
6.	08:00	12:00	16:00	20:00	
7.	08:00	12:00	18:00	20:00	
8.	06:00	10:00	14:00	18:00	
9.	02:00	09:00	16:00	20:00	
10.	09:00	14:00	16:00	20:00	
11.	06:00	10:00	16:00	21:00	
12.	06:00	14:00	18:00	20:00	14-hour gap
13.	06:00	12:00	18:00	24:00	
14.	10:00	14:00	18:00	20:00	
15.	06:00	10:00	14:00	20:00	
16.	06:00	11:00	16:00	20:00	
17.	06:00	10:00	15:00	20:00	
18.	06:00	10:00	15:00	21:00	
19.	06:00	11:00	16:00	22:00	
20.	06:00	11:30	16:00	21:30	13-hour gap
21.	06:00	10:00	16:00	24:00	
22.	10:00	14:00	18:00	21:00	

A. Jones, Royal Prince Alfred Hospital, personal communication, 2011

Facilities also need to ensure that clinical areas are measuring the correct physiological observations to identify clinical deterioration. Several studies have demonstrated that an abnormal respiratory rate is one of the most sensitive indicators of clinical deterioration and unplanned intensive care unit admissions; however, it is one of the most frequently omitted measurements.[4,6,12–13] Similarly, level of consciousness is often not measured or documented with adequate frequency or duration.[4] This increases the risk of clinical deterioration going unrecognised and treatments being delayed.

how to complete this task

DECIDE › DEVELOP › RESOURCE › EDUCATE › EVALUATE

task 1 - measure and document core observations with appropriate frequency and duration

DECIDE	▶ ▶ ▶	Reach agreement on the core physiological observations to be measured
DEVELOP	▶ ▶ ▶	Develop policies outlining the minimum frequency and duration for measurement of core physiological observations
RESOURCE	▶ ▶ ▶	Provide equipment for monitoring physiological observations Ensure staffing levels are adequate and appropriate clinical supervision is provided
EDUCATE	▶ ▶ ▶	Educate clinicians on measurement and interpretation of core physiological observations
EVALUATE	▶ ▶ ▶	Audit current practices regarding the measurement and documentation of physiological observations

DECIDE

REACH AGREEMENT ON THE CORE PHYSIOLOGICAL OBSERVATIONS TO BE MEASURED

Clinicians often have varying views on the physiological observations required to recognise clinical deterioration. Agreeing on this issue is an important step towards identifying clinical deterioration.

A growing body of evidence demonstrates the association between abnormal physiological observations and assessments, and critical illness and serious adverse events.[11,14]

National Consensus Statement recommendation

CORE PHYSIOLOGICAL OBSERVATIONS

The *National Consensus Statement: Essential elements for recognising and responding to clinical deterioration* draws on evidence about the association between abnormal physiology and subsequent adverse outcomes. The consensus statement recommends that the core physiological observations for recognising clinical deterioration are:

- respiratory rate
- oxygen saturation
- heart rate
- blood pressure
- temperature
- level of consciousness.

Abnormalities in any of the core physiological observations may indicate that a patient's condition is deteriorating. All facilities need to ensure that acute care areas measure this core set of physiological observations. This practice should be agreed by clinicians, health professionals with responsibility for policy or quality improvement, and health service managers within an organisation.

DEVELOP

DEVELOP POLICIES OUTLINING THE MINIMUM FREQUENCY AND DURATION FOR MEASUREMENT OF CORE PHYSIOLOGICAL OBSERVATIONS

The consensus statement recommends that the frequency of observations should be consistent with the clinical situation of the patient. For the majority of patients in an acute health facility, observations should be taken at least once per eight-hour shift.

Some patients may require more or less frequent observations, depending on their current clinical situation, treatment goals and requirements. For example, when the goal is to provide comfort and dignity to patients who are dying, observations may be measured less frequently.

Policies and guidelines that outline the minimum frequencies for measuring and documenting observations can improve monitoring practices.[6]

practice point

Policies about the measurement of observations can improve monitoring practices

A retrospective observational study of patient observation charts from two wards in an Australian hospital found that most physiological observations were documented more frequently in the ward that had a policy outlining measurement requirements.[6]

	Frequency of observation readings per day	
	WARD A (MEDICAL, NO POLICY)	WARD B (SURGICAL, OBSERVATION POLICY)
All observations	3.0	5.0
Blood pressure	3.8	5.5
Heart rate	3.8	5.0
Respiratory rate	1.3	0.5
Temperature	3.0	5.0

Acute care areas need to develop policies that outline the minimum frequency (times per day) and duration (number of days) of physiological observation monitoring. Health professionals who are responsible for clinical governance of recognition and response systems would usually develop these policies (see *Essential element 5: Organisational supports* for further information on clinical governance systems). Policies may be developed for a whole facility, or within individual wards or clinical areas.

Observation frequencies may vary between clinical areas based on differences in patient populations, clinical conditions and treatment requirements. Clinical areas may have several observation policies, depending on the number and types of clinical conditions and treatments they manage.

Clinical areas that are likely to need policies with different frequencies for physiological observation monitoring include:

- emergency departments
- general wards (medical and surgical)
- high-dependency, coronary care and intensive care units
- theatres and recovery units
- specialist units (e.g. paediatrics, mental health, neurology, renal, maternity, oncology, diagnostic radiology).

RESOURCE

PROVIDE EQUIPMENT FOR MONITORING PHYSIOLOGICAL OBSERVATIONS

ENSURE STAFFING LEVELS ARE ADEQUATE AND APPROPRIATE CLINICAL SUPERVISION IS PROVIDED

Equipment for measuring physiological observations should be readily available and in good working order. Lack of equipment may delay measurement of physiological observations and management of clinical deterioration. Clinical areas should establish systems for regular checking and maintenance of observation monitoring equipment.

Reduced staffing levels can prevent health professionals from measuring physiological observations with adequate frequency.[3] Nurses report regularly missing patient fluid intake and output, and being unable to regularly check patients due to insufficient staff.[10] Lower staffing levels overnight can mean that patients do not have observations measured for more than eight hours.[3] Clinical areas need to consider if staffing levels affect their ability to measure physiological observations, and develop strategies to address this problem.

Clinical areas need to consider if staffing levels affect their ability to measure physiological observations, and develop strategies to address this problem.

Adequate clinical supervision and effective communication within the healthcare team is important to ensure the correct physiological observations are measured, recognised and responded to.[3] Clinical areas should develop processes to ensure health professionals receive adequate clinical supervision, including those who are casual or from an agency.

Clinicians who are not familiar with local observation monitoring practices should be informed of the minimum frequency and core observations to be measured before caring for patients. This process may be delegated to the person in charge of a clinical area to allow both direct and indirect supervision. These practices should be clearly defined in local work procedures, and form part of education and orientation programs in each clinical area.

practice point

Defining clinical supervision

The Australian Nursing and Midwifery Council sets out definitions for clinical supervision:[15]

- "Direct clinical supervision *is when the supervisor is present and personally observes, works with, guides and directs the person being supervised."*
- "Indirect supervision *is when the supervisor works in the same facility or organisation as the supervised person, but does not constantly observe their activities. The supervisor must be available for reasonable access. What is reasonable will depend on the context, the needs of the consumer and the needs of the person who is being supervised.*"

implementation tip

Orientation checklist for observations

Checklists are a reliable, high-impact intervention for improving safety.[16] A one-page orientation checklist can be used by those responsible for orientating casual clinicians or those from an agency to clinical areas. As part of your checklist, include:

- core physiological observations to be measured
- observation monitoring frequencies
- who to report abnormal physiological observations to.

These steps will help reduce the risk of clinical deterioration going unrecognised in your clinical area.

EDUCATE

EDUCATE CLINICIANS ON MEASUREMENT AND INTERPRETATION OF CORE PHYSIOLOGICAL OBSERVATIONS

Recognising the significance of altered physiological observations is complex, and develops from integrating knowledge with clinical experience. Monitoring patient observations is often delegated to the most junior nurses, who may have been taught to undertake observations, but may not have the skills or training to interpret the results.[3] Clinicians may also regard observation monitoring as a 'task' and undervalue its importance.[3,10] This is demonstrated by the case review below.

case review

Monitoring observations of paediatric patients

A four-month-old baby, Sarah Cook, was admitted to a tertiary hospital for a hemi-nephrectomy. The following is a summary of events that occurred after her surgery.

Time	Event
11:30	Baby Sarah transferred to the recovery room and was noted to be irritable and unsettled. It was difficult to attend to a full set of physiological observations when she arrived in recovery.
11:40	Sarah was noted to be peripherally cool, but had a temperature of 36ºC. Nurses were unable to obtain an oxygen saturation measurement, as she was unsettled and screaming. A blood pressure reading could not be obtained [not palpable]; however, it was assumed that the equipment was faulty. Slight ooze was noted on Sarah's wound dressing, and her abdomen was soft.
11:45	Sarah was noted to be hungry and a trial of fluids was given. Sarah settled for short periods. Nurses had been informed that Sarah usually settled following breast feeding, so a decision was made to return her to the ward to enable her mother to breast feed her.
12:15	On admission to the ward, Sarah was cool to touch. Oxygen saturation was unrecordable. Sarah was irritable. A warm blanket was applied and her blood glucose level was measured. At this point Sarah became unresponsive, bradycardic, and had no audible breathing. Cardiopulmonary resuscitation was started.
12:30	A blood gas measurement showed that Sarah's haemoglobin was 60 g/L, and the drain site was noted to be bleeding. Her abdomen was distended and firm.

Facilities need to identify which clinicians are suitably trained for measuring physiological observations, and incorporate this information into policies and training programs. This will ensure that clinicians are made aware of individual roles and responsibilities.

Education on the significance of physiological observations (normal and abnormal) and measurement practices should be a priority for every clinical area. This should include information on:

- core physiological observations and their role in identifying clinical deterioration
- the need for policies on monitoring practices
- the minimum frequency of physiological observations
- the minimum duration of physiological observations
- the clinician to report or escalate abnormal physiological observations to
- the person responsible for orientation of new, relief or agency clinicians on observation monitoring policies in each clinical area.

Education on measurement and interpretation of physiological observations may be delivered as part of facility-wide education programs, or within individual clinical areas. Strategies to provide this education may include:

- self-directed learning packages
- competency-based skills assessment
- face-to-face structured learning courses
- peer review.

See *Essential element 6: Education* for more information about education methods and programs that can be used to provide this education.

Where physiological observation practices fall outside policy requirements, individual clinicians should receive feedback through a supportive and validated process such as peer review. This ensures that optimal observation practices are maintained, promotes learning, and reduces the risk of clinical deterioration being unrecognised in the future.

comments from colleagues

Use of education to change practice

'The scope of the education needs to target every group. It has helped us shift culture because nobody feels that they are being targeted.'

Nurse unit manager, focus groups, 2010

Education on the significance of physiological observations (normal and abnormal) and measurement practices should be a priority for every clinical area.

EVALUATE

AUDIT CURRENT PRACTICES REGARDING THE MEASUREMENT AND DOCUMENTATION OF PHYSIOLOGICAL OBSERVATIONS

All clinical areas should audit physiological observation practices. Audits may occur as part of a facility-wide audit program, or through quality improvement activities in individual clinical areas.

Audits should be based on the area's observation policy or policies, and should evaluate whether core physiological observations are measured:

- accurately
- according to minimum frequencies
- for the minimum duration.

Two types of audit may be useful: observational and documentation. Observational audit can assist to determine clinicians' practices regarding the techniques of physiological observation measurement. Documentation audit measures compliance with policy regarding minimum frequency and duration of core physiological observations.

Audit tools for evaluation of current practices related to the measurement and documentation of observations are available on the Commission's web site. Specifications for quality measures regarding completion and frequency of observations are in Appendix B.

Healthcare teams should receive the audit data, and strategies should be developed to address barriers or deficiencies in physiological observation measurement practices.

Healthcare teams should receive the audit data, and strategies should be developed to address barriers or deficiencies in physiological observation measurement practices.

implementation tip

Auditing observation and monitoring practices

- Audit and feedback is an effective strategy for changing behaviour. Remember to undertake a baseline audit before implementing your observation policy
- After physiological observation measurement policies have been introduced, initial audits should be relatively frequent (e.g. fortnightly) and results should be displayed for staff to see
- Audits should sample different staff allocation areas to ensure results reflect the ward's or unit's overall monitoring practices. For example, you could audit all even bed numbers, or odd bed numbers
- Once observation measurement practices are consistent with policy recommendations, reduce the frequency of audits (e.g. every 3–6 months).

why this task is important

This task is needed because:

- additional observations and assessments can indicate clinical deterioration and may need to be measured for specific clinical conditions
- it is difficult for all clinicians to identify which assessments and observations are needed to detect deterioration for each clinical condition
- processes are needed to ensure that relevant observations and assessments are made for each patient and communicated among the healthcare team.

Not all clinicians have enough knowledge and experience to identify the assessments and observations (other than core physiological observations) needed to detect clinical deterioration. Understanding the significance of altered assessments and observations can be complex, given the vast array of abnormalities that can occur.

Clinical deterioration may be indicated by additional observations such as pain, respiratory distress, pallor, capillary refill, pupil size and reactivity, sweating, nausea and vomiting, as well as alterations in biochemical and haematological markers.

case review

Escalating pain, vomiting and haematological markers as signs of clinical deterioration

Ruth Wright, a 71-year-old woman, was admitted to hospital with abdominal pain and diarrhoea. Her white cell count was $17x10^9$/L. An abdominal X-ray showed no bowel obstruction. She was given clear fluids and intravenous therapy. The following is a summary of events.

Time	Event
23:30	Patient requested pain relief. Tramadol and paracetamol given.
24:00	Patient vomited medication, still requesting analgesia. Resident medical officer ordered 100 mg tramadol intramuscularly, same given.
04:45	Patient crying in pain, pointing to abdominal area, rolling around the bed. RMO notified, phone order received for 5 mg morphine, 20 mg hyoscine butylbromide, same given.
12:00	Phone call from pathology: patient's white cell count $37x10^9$/L. Patient's abdomen distended.
16:30	Patient's blood pressure 92/60 mmHg, abdomen blue and mottled, medical emergency team called.
17:00	Urgent laparotomy performed for ischaemic bowel. Bowel wall was extensively gangrenous, secondary to acute mesenteric ischaemia. There was a loss of peristalsis. The damaged bowel was not resectable or viable.

Clinicians can only recognise and respond to clinical deterioration if appropriate observations and assessments are measured with adequate frequency. This also relies on the healthcare team's knowledge, experience and critical thinking.

learning from coronial inquests

Critical thinking about potential causes of deterioration

Vicki Greeuw was a 45-year-old woman involuntarily admitted to a psychiatric hospital. She was taking a number of drugs that can cause constipation, and had a documented history of previous abdominal pain and constipation. Vicki died 11 days after her admission. It was found on post mortem that Vicki had aspirated vomit after developing a bowel obstruction due to faecal impaction.

'It would appear obvious from the massive extent of the faeces that if at any stage during her period of involuntary admission the deceased had been competently physically examined her gross state of constipation would have been discovered and action would have been taken to remedy the situation. Evidence at the inquest, however, revealed that the deceased was never physically examined by any doctor prior to the day of her death.'[17]

Identifying observations and assessments for measurement (other than core physiological observations) requires a team approach that draws on each clinician's knowledge, experience and critical thinking skills. A clear monitoring plan for each patient is needed to ensure that:

- appropriate observations and assessments are monitored, considering the patient's diagnosis and proposed treatments
- the frequency of observations and assessments is suitable, considering the patient's clinical condition and proposed treatment plan
- the monitoring requirements for each patient are clearly communicated to all members of the healthcare team.

comments from colleagues

Clinical deterioration for long-term patients

'The ones who are day cases – they're easy. It's the medical patients – it's day 30, no one has checked their electrolytes and their potassium because they have been in for 30 days and they have been stable and that's when staff switch off. That's when you get problems.'

Role unknown, focus groups, 2010

how to complete this task

DECIDE → DEVELOP → RESOURCE → EDUCATE → EVALUATE

task 2 – document a monitoring plan for each patient		
DECIDE	▶▶▶	Agree on additional observations and assessments for specific patient groups
DEVELOP	▶▶▶	Develop policies or guidelines outlining additional observations and assessments for specific patient groups and treatments Develop and implement processes for documenting a clear monitoring plan for each patient
RESOURCE	▶▶▶	Provide equipment to measure additional observations and assessments
EDUCATE	▶▶▶	Educate clinicians on observations and assessments relevant to specific patient groups and treatments Educate clinicians on processes for documenting a clear monitoring plan for each patient
EVALUATE	▶▶▶	Audit documentation of monitoring plans

DECIDE

AGREE ON ADDITIONAL OBSERVATIONS AND ASSESSMENTS FOR SPECIFIC PATIENT GROUPS

Different clinical conditions and treatments need different observations and assessments to detect clinical deterioration, and to monitor treatment. Clinicians need to agree on additional observations and assessments – and the frequency of these – that specific patient groups need.

Standardising care improves the likelihood of patients having appropriate observations and assessments measured for their clinical condition.[18–19] National clinical guidelines often provide minimum requirements for observations and assessments for specific clinical conditions. Using these guidelines will help clinicians agree on minimum standards for observations and assessments for specific patient groups and treatments.

Different clinical conditions and treatments need different observations and assessments to detect clinical deterioration, and to monitor treatment. Clinicians need to agree on additional observations and assessments – and the frequency of these – that specific patient groups need.

implementation tip

Clinical practice guidelines

The Australian Clinical Practice Guidelines Portal was developed to help Australian health professionals access high-quality, evidence-based clinical practice guidelines via a single entry point. The portal is an initiative of the National Institute of Clinical Studies, an institute of the National Health and Medical Research Council.

The portal provides links to clinical practice guidelines for use in Australian healthcare settings. Each guideline is assessed according to rigorous selection criteria.

www.clinicalguidelines.gov.au

DEVELOP

DEVELOP POLICIES OR GUIDELINES OUTLINING ADDITIONAL OBSERVATIONS AND ASSESSMENTS FOR SPECIFIC PATIENT GROUPS AND TREATMENTS

DEVELOP AND IMPLEMENT PROCESSES FOR DOCUMENTING A MONITORING PLAN FOR EACH PATIENT

Clinical areas will then need to individualise care by developing processes for documenting a clear monitoring plan for each patient throughout the duration of their admission to an acute care facility.

Policies or guidelines should be developed once agreement has been reached on the additional observations and assessments for specific patient groups and treatments. The policies or guidelines should specify which additional observations and assessments are to be undertaken, how often, and by whom. These policies may apply to patient care in one or several clinical areas within a facility.

Clinical areas will then need to individualise care by developing processes for documenting a clear monitoring plan for each patient throughout the duration of their admission to an acute care facility. For many clinical areas, this will be a new process that will require changes to existing work practices. When designing these processes, clinical areas need to consider the following questions.

- Which member(s) of the healthcare team will prepare and document the monitoring plan?
- Where during the patient's journey will monitoring plans be prepared and documented?
- How will minimum observation and assessment requirements (from policy or guidelines) be incorporated into the monitoring plan?
- What format will be used to document monitoring plans?
- How frequently will monitoring plans be reviewed and updated, and who will document any changes?

Clinical pathways, diagnostic order sets and care bundles aim to ensure correct observations and assessments are made, and provide an effective method for integrating evidence into practice.[18–20] Many of these tools are already available in facilities, and should be used where possible.

practice point

Use of monitoring plans in a critical care area

An observation policy, which outlines the need for each patient to have a clear monitoring plan documented on admission, is in place in the emergency department. It is the responsibility of the nurse and the medical officer caring for the patient to prepare the monitoring plan together at initial assessment, taking into consideration the current observations, provisional diagnosis and proposed treatment plans.

The monitoring plan is documented on a specific section of the patient's emergency care plan document. The plan is reviewed and modified (if required) on team rounds, which occur three times per 24 hours, or if the patient's observations deteriorate.

All clinicians are aware of the policy, as they were required to read and sign the policy when it was first implemented. All new staff receive information on this process when they begin work in the department.

The department also uses a cardiac and stroke clinical pathway, which outlines the minimum physiological observations and other assessments (e.g. electrocardiograph, biochemistry, pupil size) required to detect clinical deterioration in these patient groups. This pathway forms the basis of the monitoring plan for these patients. The frequency of observations and assessments is reviewed and increased (if required) during team rounds, or if the patient's clinical condition deteriorates.

The department conducts quarterly audits of observation and assessment monitoring as part of its safety and quality program to ensure compliance with this process.

implementation tip

Care bundles

A care bundle is a small but critical set of processes determined by evidence of the highest quality. The processes may include observations and assessments, as well as specific interventions that improve patient outcomes for a specific diagnostic group. A variety of care bundles have been developed, including sepsis management, sepsis resuscitation, transient ischaemic attack and stroke, acute coronary syndrome and chronic obstructive pulmonary disease.

Care bundles are used widely overseas and are becoming more common in Australia. Facilities may like to use care bundles as part of a patient's monitoring plan to support appropriate observation and assessment of specific diagnostic groups. Examples of care bundles are available from:

National Institute of Clinical Studies:
www.nhmrc.gov.au/nics

Institute for Healthcare Improvement:
www.ihi.org/IHI

RESOURCE

PROVIDE EQUIPMENT TO MEASURE ADDITIONAL OBSERVATIONS AND ASSESSMENTS

Equipment for measuring additional observations and assessments should be readily available and in good working order. Lack of equipment may delay measurement of observations and management of clinical deterioration. Clinical areas should establish systems for regular checking and maintenance of equipment.

Lack of equipment may delay measurement of observations and management of clinical deterioration.

comments from colleagues

Missing observations because of missing equipment

'When we audited for complete sets of observations, we often found bits missing, and they [nurses] are telling me that it is because they had to wait for equipment, so they did what they could, and they were waiting to take the temperature or measure the saturations.'

Nurse unit manager, focus groups, 2010

EDUCATE

EDUCATE CLINICIANS ON OBSERVATIONS AND ASSESSMENTS RELEVANT TO SPECIFIC PATIENT GROUPS AND TREATMENTS

EDUCATE CLINICIANS ON PROCESSES FOR DOCUMENTING A CLEAR MONITORING PLAN FOR EACH PATIENT

Clinicians need education and training to understand observations and assessments that are relevant to specific patient groups and clinical treatments. This includes the new and continuing workforce.

Clinicians also need to understand the importance of each patient having a clear monitoring plan, and the agreed processes for developing such a plan. These processes should be incorporated into orientation programs or other educational forums.

Clinicians need education and training to understand observations and assessments that are relevant to specific patient groups and clinical treatments.

EVALUATE

AUDIT DOCUMENTATION OF MONITORING PLANS

All clinical areas should conduct audits of patient monitoring plans. These may be undertaken with audits of the frequency and duration of observations. Audits should be based on the content of policies or guidelines, and should evaluate whether:

- a monitoring plan exists for each patient
- core physiological observations are included in the monitoring plan
- observations and assessments for specific patient groups and individual patient requirements are included in the monitoring plan
- observations and assessments are planned according to minimum frequencies and duration, and measured according to the monitoring plan
- monitoring plans are reviewed and updated according to policy
- observations and assessments are being measured as specified in the monitoring plan.

A quality measure for compliance with monitoring plans is included in Appendix B.

Healthcare teams should have access to audit data, and strategies should be developed to address barriers or deficiencies in observation and assessment practices.

comments from colleagues

Local ownership of problems and strategies for improvement

'I think because the initial baseline audit was done – we saw what practice was (and it was terrible) and we identified that there were gaps in documentation. People were a little bit wary of that – they didn't believe that respiratory rate was not filled in – when you present the evidence and people have to think again about what their working practice is and they have to think [about the] safety of the patient, and then you start to see some change. With the front line clinicians this is where it starts. They have to see what's happening now – it just can't be this great message from above.'

Nurse unit manager, focus groups, 2010

why this task is important

This task is needed because:

- poorly designed observation charts reduce clinicians' ability to recognise abnormal physiological observations
- understanding the significance of altered physiological observations and initiating appropriate care is a complex process
- an objective decision-making process helps to ensure altered physiological observations and assessments are recognised and responded to.

Observation charts are tools for documenting, monitoring and communicating changes in physiological observations. The charts play a key role in recognising and responding to clinical deterioration.

Until recently, there has been very little research on the optimal design of observation charts and their effect on clinician performance. Observation chart design varies considerably within Australia. In the past, most observation charts were developed by individual hospitals, with little consideration to the design and its effect on usability and patient outcomes.[21]

Human factors research demonstrates that observation chart design affects clinicians' ability to accurately document and identify abnormal physiological measurements. Charts identified as having a better design tend to yield fewer errors and shorter decision times in simulation experiments.[22–23]

practice point

What are human factors principles?

Human factors are 'concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance.'[24]

Problems that affect the usability of observation charts include colour, font size, page layout, information layout, language and labelling, use of scales and graphs, integration of track and trigger systems, photocopying legibility and low-light legibility.[21]

practice point

The impact of chart design on the identification of abnormal physiology

Identify the abnormal physiological observations in the observation chart below.
How many abnormalities did you find?
How long did it take you to identify them?

DATE / TIME	T	P	R	BP	SPO_2 / O^3 L/rr in	Sedation	Pain
	36.5	74	12	138/82	97	1	0
	36.9	83	14	135/78	98	1	0
	37.2	70	13	132/86	96	1	0
	36.8	76	16	138/82	98	1	0
	37.8	68	12	126/72	98	1	0
	36.3	80	14	116/75	97	1	0
	37	82	14	126/82	98	1	0
	38.9	95	11	137/78	97	1	0
	37.5	86	14	127/80	98	1	0
	37.8	97	17	120/75	97	1	0
	38.3	90	21	110/80	98	1	0
	37.9	89	26	113/80	96	1	0
	39.7	118	26	85/60	94	1	0

Now review the same physiological observations in the chart below. How many abnormalities did you find? Did you identify the signs of clinical deterioration more quickly and easily using this chart?

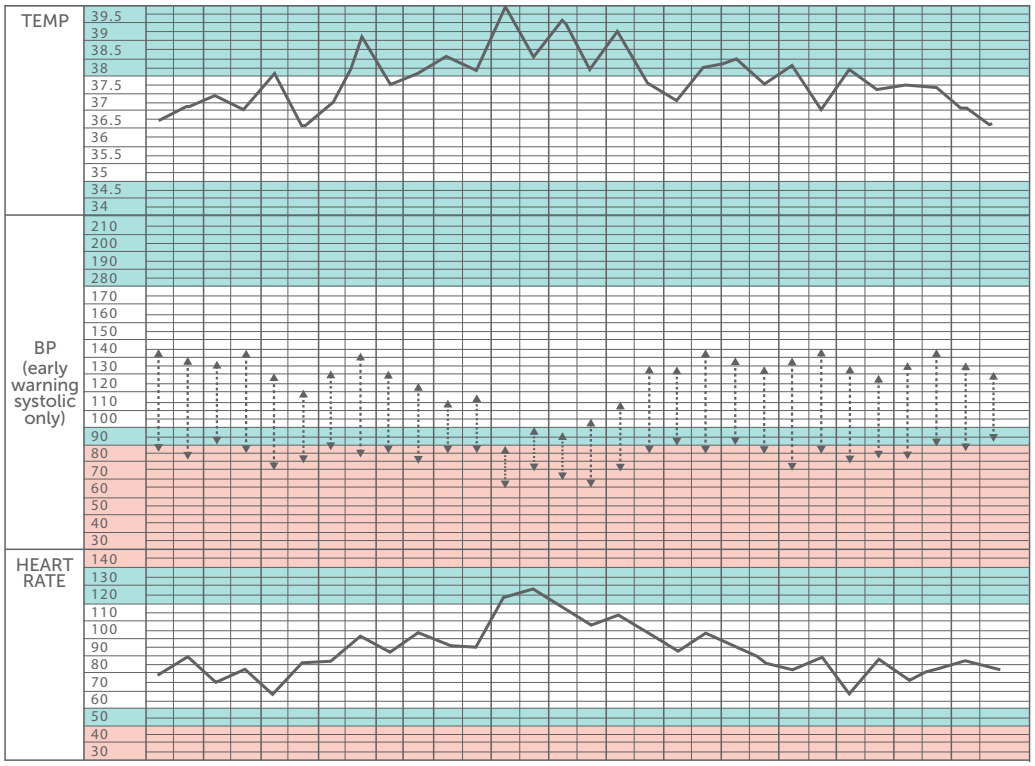


Chart design has significant impact on clinician performance, and on clinicians' ability to recognise and respond to clinical deterioration.[21]

The design of observation charts is important for identifying altered physiological observations. However, understanding the significance of these abnormalities and initiating appropriate care is a complex process, which depends on individual knowledge, critical thinking and past experiences.

Track and trigger systems – also known as early warning systems – were developed to provide an objective decision-making processes for recognising and responding to altered physiological observations and assessments.[2] These systems have had variable success in predicting admission to critical care, hospital mortality and cardiac arrest.[11]

In general, track and trigger systems provide:[11,25]

- a system for tracking changes in physiological parameters over time
- thresholds for each parameter or combination of parameters that indicate abnormality
- the response or action required when thresholds are reached or deterioration is identified.

Incorporating track and trigger systems into observation charts streamlines the processes of tracking physiological observations and triggering a set response. The system can operate at the point of care, and clinicians do not need to rely on memory to recall trigger parameters and responses.

how to complete this task

DECIDE › DEVELOP › RESOURCE › EDUCATE › EVALUATE

task 3 – use observation charts designed using human factors principles that incorporate a track and trigger system

DECIDE	▶▶▶	Decide on the type of track and trigger system to be used
DEVELOP	▶▶▶	Develop trigger thresholds and responses, considering available resources and different patient groups
RESOURCE	▶▶▶	Incorporate track and trigger systems into an observation chart designed using human factors principles
EDUCATE	▶▶▶	Educate clinicians on the use of observation and response charts
EVALUATE	▶▶▶	Audit clinical areas where observation and response charts are used Monitor incidents and critical events to identify problems with observation charts

DECIDE

DECIDE ON THE TYPE OF TRACK AND TRIGGER SYSTEM TO BE USED

There are several hundred track and trigger systems available for adult and paediatric populations.[26] Many Australian hospitals use these systems, and work is underway in Australia to develop track and trigger systems for other patient groups.

Decisions on the type of track and trigger system to use are usually made by a group of health professionals, including those with responsibility for policy and quality improvement, managers, hospital executives, and private hospital owners. These decisions are usually made as part of local clinical governance processes for recognition and response systems (see *Essential element 5: Organisational supports* for further information on clinical governance systems). Some statewide services and private hospital groups have decided what type of track and trigger system their facilities will use, and health professionals in these groups will need to use the prescribed system. Links to information about statewide charts are included in Appendix C.

A common type of single-parameter system in Australia is the calling criteria for a medical emergency team.

The National Institute for Health and Clinical Excellence in the United Kingdom has identified three types of track and trigger systems.[11]

1. Single-parameter systems: periodic observations of selected physiological parameters are compared with a simple set of criteria with predefined thresholds. A response algorithm is activated when any threshold is reached. A common type of single-parameter system in Australia is the calling criteria for a medical emergency team.

2. Aggregate scoring systems: weighted scores are assigned to values of physiological parameters and compared with predefined trigger thresholds. The modified early warning score (MEWS) is one of the most common aggregated scoring systems. These systems are more complex than single parameter systems, and usually require measurement of a number of parameters and calculation of a score.[11,27] These systems can be prone to human calculation errors, but this can be addressed by automated electronic systems such as handheld computers.[11]

3. Combination systems: single-parameter and aggregate scoring systems systems used in combination.

Systems vary in the type and number of physiological measures included. Most systems use a core set of parameters: heart rate, respiratory rate, blood pressure, consciousness, temperature, oxygen saturation and urine output. Others are more complex and include parameters that are not routinely measured on general wards, such as base excess, creatinine, and blood oxygen and carbon dioxide pressure.[11,27] There is also variation in the cut-off points that trigger a response (the trigger thresholds), the weighting of measures and scoring algorithms.

It is difficult to compare different track and trigger systems – a large number of systems are available that have been developed in different ways.[27] Reviews of track and trigger systems have found that performance of most systems is imperfect, with questions raised about their validity and reliability in accurately identifying patients whose condition will deteriorate. Despite the results of such reviews and a lack of consensus on which system to use, national and international patient safety organisations and experts recommend using track and trigger systems to improve the recording of observations and avoid delays in recognising and responding to clinical deterioration.[11,25]

practice point

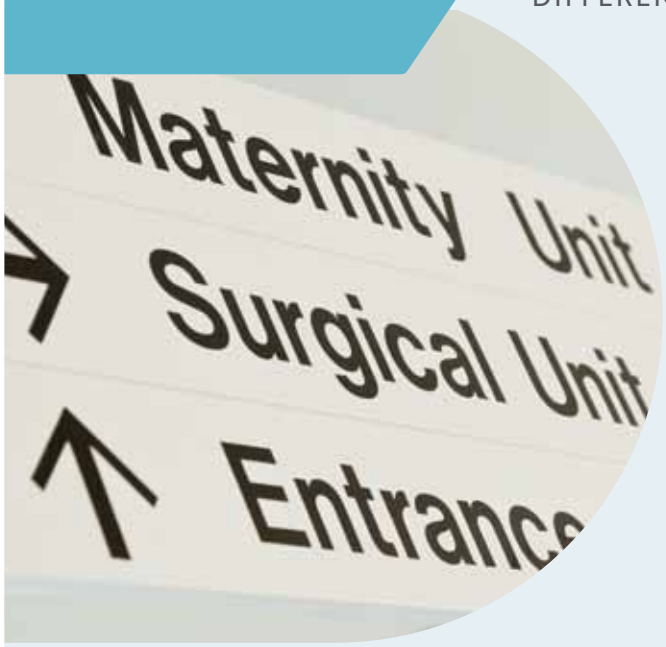
What's in a name?

The name of a track and trigger system, such as modified early warning score (MEWS), does not necessarily mean that all MEWS will have the same physiological scores and trigger thresholds. In the United Kingdom, MEWS scores and thresholds can vary considerably between hospitals.

Despite a lack of consensus on which systems to use, national and international patient safety experts recommend using track and trigger systems to improve the recording of observations and avoid delays in recognising and responding to clinical deterioration.

DEVELOP

DEVELOP TRIGGER THRESHOLDS AND RESPONSES, CONSIDERING AVAILABLE RESOURCES AND DIFFERENT PATIENT GROUPS



Thresholds in a track and trigger system are a single physiological parameter, observation or assessment, or a group of parameters, that triggers escalation of care and clinical response.

Thresholds in a track and trigger system are a single physiological parameter, observation or assessment, or a group of parameters, that trigger escalation of care and clinical response. Thresholds and responses need to be developed with consideration of treatment and monitoring needs of the patient, the level of physiological abnormality each threshold represents, and locally available resources.

Some statewide services and private hospital groups in Australia have set trigger thresholds. Facilities need to ensure that local trigger thresholds and responses are consistent with any decisions made by these jurisdictions. In some cases, local facilities can make changes to trigger thresholds after a consultation process and agreement.

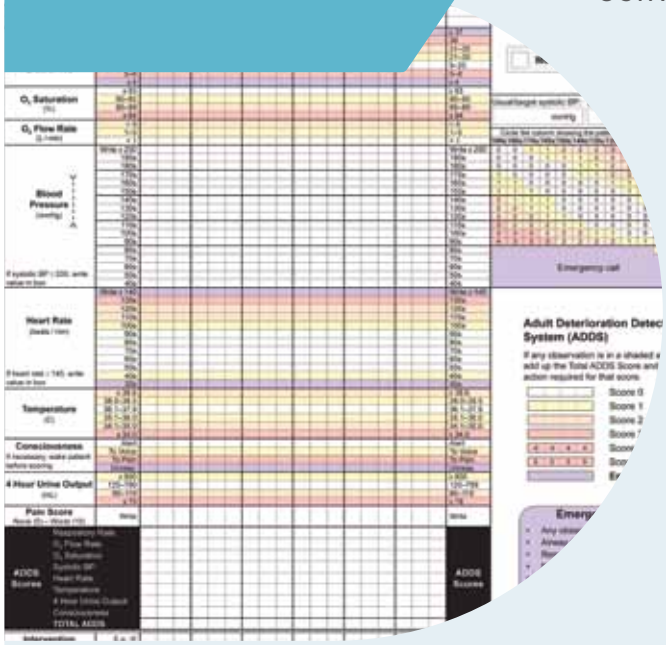
As a minimum, track and trigger systems should include measurement of the core physiological parameters required to detect clinical deterioration: heart rate, respiratory rate, systolic blood pressure, level of consciousness, oxygen saturation and temperature.

Developing trigger thresholds and associated responses is a complex process. Facilities developing their own thresholds will need to identify the threshold for each parameter, and consider the:

- treatments and timeframe required to respond to trigger thresholds
- appropriate skill level of the responder to safely manage the clinical deterioration
- resources available to safely manage the clinical deterioration and possible treatment.

This process will provide a graded response according to the level of physiological abnormality. This is explored in detail in *Essential element 2: Escalation of care*.

RESOURCE:



INCORPORATE TRACK AND TRIGGER SYSTEMS INTO AN OBSERVATION CHART DESIGNED USING HUMAN FACTORS PRINCIPLES

The Australian Commission on Safety and Quality in Health Care (the Commission), in partnership with Queensland Health and the University of Queensland, has designed a number of observation and response charts based on human factors principles.

The observation and response charts allow facilities to incorporate the specific details of their track and trigger system – including thresholds and responses – into a chart with optimal design characteristics for recognition and response to clinical deterioration.

practice point

Human factors usability principles for observation charts

The usability principles that have driven the design of the Commission's observation and response charts are as follows.[28]

- Page layout: avoid including information that is rarely needed and would lead to clutter; lay out the page to match the user's task as naturally as possible; use a landscape layout to maximise the amount of information that the user can attend to.
- Information layout: present the exact information the user needs at the exact time and place it is needed; display the most important information at the top left of the page in decreasing order of importance.
- Recording observations: ensure that data points for two observations cannot be confused; provide enough space to accurately record information and ensure trends are clear; use clear and descriptive labels.
- Integration of track and trigger systems: include clear instructions for use of the track and trigger system; keep information relevant to the track and trigger system close together; ensure that the basic functionality of the system is understandable in one hour.
- Language and labelling: use clear expressions; avoid abbreviations that could be misinterpreted.
- Cognitive and memory load: avoid information that needs to be compared or transcribed over more than one area of a page or multiple pages; where possible, provide options to circle or tick rather than write information.
- Use of fonts: avoid fonts that are too small (less than 11 point) or too large (12 or 14 point); avoid fonts that can slow reading (serif fonts, capitalisation); only use one font.
- Use of colour: use colour in a meaningful way; ensure that colours are distinguishable for colourblind users; ensure that the chart does not look too busy by using no more than five colours (including white, text and logos).
- Photocopying legibility: ensure the chart (particularly the observation measurements) is legible at a range of photocopier settings.
- Low light legibility: ensure that the chart is legible in realistic low light settings.

Five observation and response charts have now been developed:

- adult deterioration detection system (ADDS): an aggregate weighted scoring system with a single parameter emergency response category
- adult deterioration detection system (ADDS with blood pressure table): an aggregate weighted scoring system with a single parameter emergency response category, including a look up table regarding the patient's normal blood pressure
- single-parameter system with four response categories (increased surveillance, senior nurse review, clinical review, emergency call)
- single-parameter system with two response categories (clinical review or emergency call)
- single-parameter system with one response category (emergency call).

implementation tip

Customising observation and response charts

The observation and response charts provided by the Commission should be considered as templates because they need to be customised for local use. The Commission's work with the observation and response charts focused on the design of the chart, and each chart needs to be customised according to the clinical and organisational systems in place within each facility. Each chart contains trigger thresholds and response actions; however, these should be considered as placeholders only. Facilities should go through the processes described in *Essential element 2: Escalation of care* to identify appropriate trigger thresholds and responses for their circumstances.

Although the clinical and organisational aspects of the observation and response charts need to be customised for local use, the Commission **does not recommend making changes to the design** of the charts. The charts have been designed with the benefit of human factors expertise to ensure that they are user friendly, and fit for the purpose of supporting accurate and timely recognition of clinical deterioration.

The University of Queensland has prepared a developer's guide that discusses each part of an observation and response chart in detail.[28] It describes what should and should not be changed in a chart to maintain the human factors principles and patient safety benefits. Reading and understanding the developer's guide is essential for correctly incorporating local information into the observation and response charts. The developer's guide should be used when customising the charts for local use. If further design changes are made to observation and response charts, it is important to demonstrate that the changes will not have a detrimental impact on patient safety.

Decisions about observation charts generally occur at a facility level, following consultation with the health professionals responsible for clinical governance of recognition and response systems (see *Essential element 5: Organisational supports* for further information on clinical governance systems).

Some statewide jurisdictions and private hospital groups in Australia have developed and implemented observation charts for use in their facilities. Facilities need to ensure that any actions they take to change their existing observation charts are consistent with any decisions or programs about observation charts that may be in place within these jurisdictions.

Where there is no statewide or similar chart, and facilities need to have their own chart, the Commission strongly recommends using one of the five observation and response charts that have been designed according to human factors principles. It should be noted that these charts are currently the subject of research regarding their use in a clinical environment, and they should be regarded as drafts at this stage. They are likely to change following research conducted by the Commission in 2011–12.

All observation and response charts are available from the Commission's web site, along with regular updates on the ongoing research.

The observation and response charts are general adult observation charts. The charts themselves (particularly the template and design principles) may be useful for a variety of clinical areas, including general wards, mental health units, emergency departments, paediatric units and maternity units. Other speciality clinical areas may choose to use these charts in combination with supplementary charts to record additional observations such as neurological observations.

implementation tip

Observation charts for paediatric and maternity settings

Observation charts specifically for paediatric patients have been developed in Australia. The trigger thresholds in these charts vary according to the age of the child.

In New South Wales, a series of paediatric charts have been developed as part of the Between the Flags program. These are single parameter charts with three response categories, and align with the standard adult general observation (SAGO) chart that is in place across NSW.

In Queensland, the children's early warning tool (CEWT) is a chart with an aggregate weighted scoring system built in. The chart was designed according to human factors principles and has been the subject of a prospective trial regarding the trigger thresholds used.

In the Australian Capital Territory, paediatric charts have been developed as part of the COMPASS program. These charts are available from the COMPASS web site (www.health.act.gov.au/c/health?a=sp&did=11025490).

There is now a focus on the development of charts and track and trigger systems that can be used in a maternity setting, and these states and territories are undertaking work in this area.

EDUCATE

EDUCATE CLINICIANS ON THE USE OF OBSERVATION AND RESPONSE CHARTS

Clinicians need education on how to use observation and response charts. This should include a skills-based component that allows clinicians to use the chart and the trigger response system.

Clinicians need education on how to use observation and response charts.

implementation tip

Plotting patient observations

A powerful way to demonstrate the value of new observation and response charts with built in trigger thresholds is to plot the physiological observations of patients on new and old charts. Identify patients who may have had an adverse outcome associated with a failure to recognise clinical deterioration, or a delayed call to a medical emergency team. Plot their observations for a period of time before the call or adverse outcome. Generally, it will be much easier to identify deterioration with the new chart. This will show where action could have been taken earlier to intervene and potentially stabilise the patient.

EVALUATE

AUDIT CLINICAL AREAS WHERE OBSERVATION AND RESPONSE CHARTS ARE USED

MONITOR INCIDENTS AND CRITICAL EVENTS TO IDENTIFY PROBLEMS WITH OBSERVATION CHARTS

Observation charts that have not been designed according to human factors principles are commonly used in certain situations, such as when the frequency of observations increases (e.g. during blood transfusions). This practice may increase the risk of unrecognised clinical deterioration, and can delay responses if the charts do not have track and trigger systems.

Observation and response charts can be used as general observation charts in most clinical areas. Facilities should audit relevant clinical areas to ensure they are using observation charts that meet the requirements of the consensus statement and the *National safety and quality health service standards* (the standards).

Incidents and critical events may also identify problems with observation chart design or use. Facilities should monitor these events as part of their evaluation processes.

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summary of tasks and actions for essential element 1

Task	What is required?	Who is responsible?	Consensus statement recommendations	National safety and quality health service standards actions
task 1 **Measure and document core physiological observations with appropriate frequency and duration**	**DECIDE** Reach agreement on the core physiological observations to be measured	Health professionals with responsibility for policy or quality improvement Clinicians	1.6 Physiological observations should include: • respiratory rate • oxygen saturation • heart rate • blood pressure • temperature • level of consciousness	9.3.1 When using a general observation chart, ensure that it: • includes the capacity to record information about respiratory rate, oxygen saturation, heart rate, blood pressure, temperature and level of consciousness graphically over time
	DEVELOP Develop policies outlining the minimum frequency and duration for measurement of core physiological observations	Health service managers Health professionals with responsibility for policy or quality improvement Clinicians	1.1 Observations should be taken on all patients in acute care settings 1.2 Observations should be taken on patients at the time of admission or initial assessment 1.4 The frequency of observations should be consistent with the clinical situation of the patient. For the majority of patients in an acute health facility, observations should be taken at least once per eight hour shift 1.5. The frequency of observations should be reconsidered and possibly modified according to changes in clinical circumstances	9.1.2 Policies, procedures and/or protocols for the organisation are implemented in areas such as: • measurement and documentation of observations
	RESOURCE Provide equipment for monitoring physiological observations Ensure staffing levels are adequate and appropriate clinical supervision is provided	Health service executive and owners Health service managers	5.1 A formal policy framework regarding recognition and response systems should exist and should include include issues such as: • roles and responsibilities • resources for the rapid response system, such as staff and equipment	N/A

summary of tasks and actions for essential element 1

Task	What is required?	Who is responsible?	Consensus statement recommendations	National safety and quality health service standards actions
task 1 **Measure and document core physiological observations with appropriate frequency and duration**	**EDUCATE** Educate clinicians on measurement and interpretation of core physiological observations	Educators Health service managers Clinicians	6.2 All doctors and nurses should be able to: • understand and interpret abnormal physiological parameters and other abnormal observations	1.4.1 Orientation and ongoing training programs provide the workforce with the skill and information needed to fulfil their safety and quality roles and responsibilities 1.4.2 Annual mandatory training programs to meet the requirements of these standards 1.4.3 Locum and agency workforce have the necessary information, training and orientation to the workplace to fulfil their safety and quality roles and responsibilities 1.4.4 Competency-based training is provided to the clinical workforce to improve safety and quality
	EVALUATE Audit current practices regarding the measurement and documentation of core physiological observations	Health professionals with responsibility for policy or quality improvement Health service managers	7.1 Data should be collected and reviewed locally and over time regarding the implementation and effectiveness of recognition and response systems	9.3.2 Mechanisms for recording physiological observations are regularly audited to determine the proportion of patients that have complete sets of observations recorded in agreement with their monitoring plan 9.3.3 Action is taken to increase the proportion of patients with complete sets of recorded observations, as specified in the patient's monitoring plan
task 2 **Document a monitoring plan for each patient**	**DECIDE** Agree on additional observations and assessments for specific patient groups	Health professionals with responsibility for policy or quality improvement Clinicians	1.9 Clinicians may choose to document other observations and assessments to support timely recognition of deterioration	N/A

summary of tasks and actions for essential element 1

Task	What is required?	Who is responsible?	Consensus statement recommendations	National safety and quality health service standards actions
task 2 **Document a monitoring plan for each patient**	**DEVELOP** Develop policies or guidelines outlining additional observations and assessments for specific patient groups and treatments Develop and implement processes for documenting a clear monitoring plan for each patient	Health professionals with responsibility for policy or quality improvement Health service managers Clinicians	1.3 For every patient, a clear monitoring plan should be developed that specifies the physiological observations to be recorded and the frequency of observations, taking into account the patient's diagnosis and proposed treatment	1.7.1 Agreed and documented clinical guidelines and/or pathways are available to the clinical workforce
	RESOURCE Provide equipment to measure additional observations and assessments	Health service boards, executives and owners	5.1 A formal policy framework regarding recognition and response systems should exist and include issues such as: • roles and responsibilities • resources for the rapid response system, such as staff and equipment	N/A
	EDUCATE Educate clinicians on observations and assessments relevant to specific patient groups and treatments Educate clinicians on processes for documenting a clear monitoring plan for each patient	Educators Health service managers Clinicians	6.2 All doctors and nurses should be able to: • systematically assess a patient • undertake tasks required to properly care for patients who are deteriorating, such as developing a clinical management plan, writing plans and actions in the healthcare record and organising appropriate follow up	1.4.1 Orientation and ongoing training programs provide the workforce with the skill and information needed to fulfil their safety and quality roles and responsibilities 1.4.2 Annual mandatory training programs to meet the requirements of these standards 1.4.3 Locum and agency workforce have the necessary information, training and orientation to the workplace to fulfil their safety and quality roles and responsibilities 1.4.4 Competency-based training is provided to the clinical workforce to improve safety and quality

summary of tasks and actions for essential element 1

Task	What is required?	Who is responsible?	Consensus statement recommendations	National safety and quality health service standards actions
	EVALUATE Audit documentation of monitoring plans	Health service managers Health professionals with responsibility for policy or quality improvement	7.1 Data should be collected and reviewed locally and over time regarding the implementation and effectiveness of recognition and response systems	N/A
task 3 **Use observation charts designed according to human factors principles that incorporate a track and trigger system**	**DECIDE** Decide on the type of track and trigger system to be used	Health professionals with responsibility for policy or quality improvement Clinicians Health service managers	1.8 Observation charts should display information in the form of a graph. An observation chart should include: • a system for tracking changes in physiological parameters over time	N/A
	DEVELOP Develop trigger thresholds and responses, considering available resources and different patient groups	Health professionals with responsibility for policy or quality improvement Clinicians Health service managers	1.8 Observation charts should display information in the form of a graph. An observation chart should include: • thresholds for each physiological parameter or combination of parameters that indicate abnormality • information about the response or action required when thresholds for abnormality are reached or deterioration identified	9.3.1 When using a general observation chart, ensure that it: • includes thresholds for each physiological parameter or combination of parameters that indicate abnormality • specifies the physiological abnormalities and other factors that trigger the escalation of care
	RESOURCE Incorporate track and trigger systems into an observation chart designed using human factors principles	Health professionals with responsibility for policy or quality improvement Health service managers	1.7 The minimum physiological observations should be documented in a structured tool such as an observation chart	9.3.1 When using a general observation chart, ensure that it: • is designed according to human factors principles

summary of tasks and actions for essential element 1

Task	What is required?	Who is responsible?	Consensus statement recommendations	National safety and quality health service standards actions
task 3 **Use observation charts designed according to human factors principles that incorporate a track and trigger system**	**EDUCATE** Educate clinicians on the use of observation and response charts	Educators Health service managers	6.2 All doctors and nurses should be able to: • undertake tasks required to properly care for patients who are deteriorating, such as developing a clinical management plan, writing plans and actions in the healthcare record and organising appropriate follow up	1.4.1 Orientation and ongoing training programs provide the workforce with the skill and information needed to fulfil their safety and quality roles and responsibilities 1.4.2 Annual mandatory training programs to meet the requirements of these standards 1.4.3 Locum and agency workforce have the necessary information, training and orientation to the workplace to fulfil their safety and quality roles and responsibilities 1.4.4 Competency-based training is provided to the clinical workforce to improve safety and quality
	EVALUATE Audit clinical areas where observation and response charts are used Monitor incidents and critical events to identify problems with observation charts	Health professionals with responsibility for policy or quality improvement Health service managers	7.1 Data should be collected and reviewed locally and over time regarding the implementation and effectiveness of recognition and response systems	9.2.2 Deaths or cardiac arrests for a patient without an agreed treatment-limiting order (such as not for resuscitation or do not resuscitate) are reviewed to identify the use of the recognition and response systems, and any failures in these systems

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