Healthcare Improvement Scotland | SIGN Evidence-based clinical guidelines

SIGN 167

Care of deteriorating patients

A national clinical guideline

First published June 2023

NHS SCOTLAND

Key to evidence statements and recommendations

Levels of evidence

1^{++}	High-quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias
1^{+}	Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias
1^{-}	Meta-analyses, systematic reviews, or RCTs with a high risk of bias
2^{++}	High-quality systematic reviews of case-control or cohort studies High-quality case-control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal
2^{+}	Well-conducted case-control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal
2^{-}	Case-control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal
3	Non-analytic studies, eg case reports, case series
4	Expert opinion

Recommendations

Some recommendations can be made with more certainty than others. The wording used in the recommendations in this guideline denotes the certainty with which the recommendation is made (the 'strength' of the recommendation).

The 'strength' of a recommendation takes into account the quality (level) of the evidence. Although higher-quality evidence is more likely to be associated with strong recommendations than lower-quality evidence, a particular level of quality does not automatically lead to a particular strength of recommendation.

Other factors that are taken into account when forming recommendations include: relevance to the NHS in Scotland; applicability of published evidence to the target population; consistency of the body of evidence; and the balance of benefits and harms of the options.

R For '**strong**' recommendations on interventions that '**should**' be used, the guideline development group is confident that, for the vast **majority** of people, the intervention (or interventions) will do more good than harm. For '**strong**' recommendations on interventions that '**should not**' be used, the guideline development group is confident that, for the vast **majority** of people, the intervention (or interventions) will do more harm than good.

R For '**conditional**' recommendations on interventions that should be '**considered**', the guideline development group is confident that the intervention will do more good than harm for **most** patients. The choice of intervention is therefore more likely to vary depending on a person's values and preferences, and so the healthcare professional should spend more time discussing the options with the patient.

Good-practice points

✓ Recommended best practice based on the clinical experience of the guideline development group.

NICE has accredited the process used by Scottish Intercollegiate Guidelines Network to produce clinical guidelines. The accreditation term is valid until 31 March 2025 and is applicable to guidance produced using the processes described in SIGN 50: a guideline developer's handbook, 2019 edition (www.sign.ac.uk/our-guidelines/sign-50-a-guideline-developers-handbook). More information on accreditation can be viewed at www.nice.org.uk/accreditation

Healthcare Improvement Scotland (HIS) is committed to equality and diversity and assesses all its publications for likely impact on the six equality groups defined by age, disability, gender, race, religion/belief and sexual orientation.

SIGN guidelines are produced using a standard methodology that has been equality impact assessed to ensure that these equality aims are addressed in every guideline. This methodology is set out in the current version of SIGN 50, our guideline manual, which can be found at www.sign.ac.uk alongside the EQIA assessment of the manual. The full report in paper form and/or alternative format is available on request from the Healthcare Improvement Scotland Equality and Diversity Officer.

Every care is taken to ensure that this publication is correct in every detail at the time of publication. However, in the event of errors or omissions corrections will be published in the web version of this document, which is the definitive version at all times. This version can be found on our website www.sign.ac.uk

Scottish Intercollegiate Guidelines Network

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First published June 2023

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Contents

1 Introduction

1.1 The need for a guideline

Patient outcomes can be significantly affected by the processes in place to identify, monitor, respond to and escalate the care of the deteriorating patient. Effective systems should be developed and adapted to the needs of the local patient population, the skills and training of clinical staff and institutional capability.

In 2014, the Scottish Intercollegiate Guidelines Network (SIGN) published consensus recommendations to underpin a national approach to the care of deteriorating patients. These recommendations set out the essential elements for prompt and reliable recognition of deteriorating patients, based on the National Early Warning Score (NEWS), which was developed by the Royal College of Physicians in 2012 and updated to NEWS2 in 2017.[1] There have been significant developments in the processes of care for deteriorating patients since the original guideline was published in 2014. There has also been a growing appreciation that it is key to have reliable processes in place to identify and manage deteriorating adults in both primary and secondary healthcare settings.

This document aims to provide updated guidance for best practice, based on current evidence, expert opinion and lived experience.

1.1.1 Patient perspective

Patients may have different perspectives on healthcare processes and outcomes from those of healthcare professionals. The involvement of patients in guideline development is therefore important to ensure that guidelines reflect their needs and concerns and address issues that matter to them.

Common concerns raised by patient groups and through research include the fact that patients, and their relatives, may intuitively sense that they are deteriorating. The opinions of patients and carers should therefore be considered in the overall assessment of clinical deterioration.

1.2 Remit of the guideline

1.2.1 Overall objectives

This guideline provides evidence-based and consensus recommendations for best practice in the management of clinical deterioration in non-pregnant adult patients. The focus is on timely planning, recognition and escalation of those experiencing acute deterioration. It is acknowledged that many with life-limiting illness may have a different focus of care, with the overall aim of palliation of symptoms rather than disease recovery – this is covered by the Scottish Palliative Care Guidelines.

The remit of the present guideline includes deteriorating patients within:

- community care settings
- primary care settings
- secondary care settings, including ambulance services.

It excludes:

- pregnant patients (see specific guidance in the Royal College of Physicians' Managing acute medical problems in pregnancy toolkit alongside the Scottish Maternity Early Warning System)
- children under 16 years
- patients undergoing palliation at the end of life.

1.2.2 Target users of the guideline

This guideline will be of interest to:

- healthcare professionals who are involved in the care of deteriorating patients in all settings
- relatives and carers of deteriorating patients
- service commissioners.

1.2.3 Plain language summary

A plain language summary of this guideline is available from the SIGN website, www.sign.ac.uk

1.3 Statement of intent

This guideline is not intended to be construed or to serve as a standard of care. Standards of care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge and technology advance and patterns of care evolve. Adherence to guideline recommendations will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results.

The ultimate judgement must be made by the appropriate healthcare professional(s) responsible for clinical decisions regarding a particular clinical procedure or treatment plan. This judgement should only be arrived at through a process of shared decision making with the patient, covering the diagnostic and treatment choices available. It is advised, however, that significant departures from the national guideline or any local guidelines derived from it should be documented in the patient's medical records at the time the relevant decision is taken.

1.3.1 Influence of financial and other interests

It has been recognised that financial or academic interests may have an influence on the interpretation of evidence from clinical studies.

It is not possible to completely eliminate any possible bias from these sources, nor even to quantify the degree of bias with any certainty. SIGN requires that all those involved in the work of guideline development should declare all financial and academic interests, whether direct or indirect, annually for as long as they are actively working with the organisation. By being explicit about the influences to which contributors are subjected, SIGN acknowledges the risk of bias and makes it possible for guideline users or reviewers to assess for themselves how likely it is that the conclusions and guideline recommendations are based on a biased interpretation of the evidence.

Signed copies of declaration of interests forms are retained by the SIGN Executive and are available on request from the SIGN Executive and a register of interests is available in the supporting material section for this guideline at www.sign.ac.uk.

1.4 How this guideline was developed

To develop this guideline, an evidence review was conducted for each key question. Where studies were too limited to support an evidence-based conclusion, the guideline development group used their clinical expertise to develop consensus statements, which were then voted on using a modified Delphi process *(see section 11, Development of the guideline)*.

Recommendations based on the evidence review are marked **E**, while those based on the consensus process are marked **C**.

1.5 Terms used in this guideline

The following definitions are used in the context of this guideline.

Anticipatory care plan (ACP) An ACP documents a care plan with recommendations to guide treatment and care decisions should a patient become acutely unwell at some point in the future.

Clinical deterioration The physiological decompensation that occurs when a patient experiences worsening conditions or an acute onset of a serious physiological disturbance.[2]

Clinical staff Any member of the multidisciplinary team delivering direct patient care.

Community care setting Any non-acute inpatient setting, such as a community hospital or rehabilitation facility.

Critical care outreach teams (CCOTs) Teams that offer intensive care interventions to patients with, or who are at risk of, critical illness who are receiving care in locations outside the intensive care unit, for example in standard wards.[3] These can also be referred to as 'rapid response teams'.

Prehospital setting Any setting whereby a deteriorating patient is being assessed prior to hospital, such as primary care, care home and ambulance services.

Track and trigger systems Track and trigger systems are a way of recording standard observations (such as heart rate, respiratory rate, blood pressure, oxygen saturation, temperature and level of consciousness) and converting these into a score.[4]

Treatment escalation plan (TEP) A TEP defines which interventions might benefit an individual when they present to acute care or if they deteriorate further during an episode of acute care.

2 Planning and decision making

2.1 Anticipatory care plans

An anticipatory care plan (ACP) documents a care plan with recommendations to guide treatment and care decisions should a patient become acutely unwell at some point in the future. An ACP is often completed in an outpatient setting or at the point of hospital discharge. It will often include decisions about escalation to critical care, other interventions and hospital admission. An ACP will usually address decisions about cardiopulmonary resuscitation status. It may also define in what situations other treatment options such as palliative care may be considered. The ACP may also include preferred place of care, and statements of values (eg patient views on balancing extending life with maximising comfort and dignity, *see section 8*).

A feasibility study in a community setting came to no clear conclusions regarding outcomes after ACP intervention.[5] A systematic review from 2014 dealt specifically with decision making in relation to DNACPR (do not attempt cardiopulmonary resuscitation).[6] While some inference could be made regarding ACPs and treatment escalation plans (TEPs), it is not possible to draw firm conclusions. 1⁻ 2⁺

The SIGN-endorsed guideline on shared decision making (NG197) from the National Institute for Health and Care Excellence (NICE) provides advice on how to support patients and families with decision making, which could help with creating ACPs or TEPs, as might Healthcare Improvement Scotland's anticipatory care planning toolkit. The Chief Medical Officer for Scotland's Realistic Medicine report (published 2022) endorses ReSPECT for emergency care planning.

R C **All patients at risk of clinical deterioration should have a documented anticipatory care plan that is completed with input from the patient and their family. Documented plans should be accessible to all care providers.**

R C **The anticipatory care plan should include a decision on cardiopulmonary resuscitation in the event of cardiac or respiratory arrest.**

R C **Cardiopulmonary resuscitation status should not be the sole focus of the anticipatory care plan.**

2.2 Treatment escalation plans

Treatment escalation plans (TEPs) define which interventions might benefit an individual when they present to acute care or if they deteriorate further during an episode of acute care. The TEP may be informed by a patient's ACP but also address the fact that the patient has presented to acute care services, and therefore by definition their clinical status is in flux. The interventions addressed by a TEP should include levels of invasive care to be considered. This may include consideration of advanced therapy in critical care such as invasive ventilation or renal replacement therapy. The TEP should also include consideration of cardiopulmonary resuscitation status. It may also define when other treatment options, such as palliative care, may be of benefit.

A narrative review outlines the current evidence regarding clinical outcomes associated with the use of TEPs.[7] 4

R C **A treatment escalation plan should be formulated for patients at risk of clinical deterioration where the risks or benefits of certain therapies may be in doubt. The treatment escalation plan should be formulated with input from the patient and their family.**

R C **The treatment escalation plan should incorporate a decision about cardiopulmonary resuscitation in the event of cardiac or respiratory arrest.**

R C **Cardiopulmonary resuscitation status should not be the sole focus of the treatment escalation plan.**

R C **The treatment escalation plan should include a comment on the patient's medically assessed suitability for advanced therapy should further deterioration occur.**

✓ Treatment escalation plans should be reviewed regularly if the patient's clinical status is changing.

3 Recognition of clinical deterioration

3.1 Observations

3.1.1 Taking observations

The previous version of this guideline[8] identified that healthcare professionals should take observations for acutely ill adult patients. Taking full observations may not be appropriate for all patients, such as those receiving palliative care at the end of life. Recognition of deterioration should not be based solely on taking observations; it can also be identified from clinician or carer concern.

- Physiological observations should be recorded at the time of admission or initial assessment.
- A clear written monitoring plan should specify which physiological observations should be taken and how often.
- Observations should be performed by staff trained to undertake these procedures and who understand their clinical significance, including when to seek urgent clinical assistance.
- In certain settings, regular assessment of staff taking observations should be undertaken, to defined competency standards.
- As a minimum, observations should include:
  - pulse rate
  - respiratory rate
  - systolic blood pressure
  - level of consciousness or new confusion
  - oxygen saturation including percentage/flow rate of administered oxygen therapy
  - temperature.

In specific situations additional monitoring may be required to recognise deterioration, for example biochemical analysis (such as blood glucose or lactate), state of hydration, urine output or pain assessment.

Four high-quality systematic reviews were inconclusive in their comparison of electronic and manual observation taking.[9–12] 1++ 2++

3.1.2 Transcribing and charting observations

There was limited high-quality evidence for different types of observation recording. None of the studies identified focused on transcribing or charting observations.

R C **Observations should be transcribed electronically, charted electronically and displayed electronically and be underpinned by effective information technology (IT) systems, protocols and support to ensure ease of use. Appropriate paper-based systems should be readily available as a safeguard in the event of IT failure.**

3.2 Escalation of care and the response to deterioration

Some electronic observation systems collate and display observations electronically but still rely on a bedside healthcare worker manually contacting a co-worker (eg junior doctor) if the observations are concerning (such as by pager or telephone). Other electronic observation systems automatically contact a healthcare worker when a set level of deterioration is met (eg automatically messaging a junior doctor when the NEWS2 score is 7). This is termed 'automated escalation'. The group considered that automated escalation may be more reliable than a manual system, but may also add to the overall burden of task management of front-line staff.

Three studies were identified, all of which suggested an improvement in clinical outcomes, including reduced numbers of cardiac arrests, with automated escalation.[13–15] However, they are limited in their quality as before-and-after studies, and do not provide sufficient evidence on which to base a recommendation. 3

Consensus could not be reached on the automated escalation of care in primary and community care settings.

R C **Within an acute care setting, consider the use of automated prompts based on NEWS2 or other criteria alongside traditional methods of escalating care (such as direct telephone calls or paging systems). Implementation of such systems relies on adequate staffing resource to manage the generated automated alerts.**

4 Early warning scores

The majority of NHS boards across Scotland use NEWS2 as their observation system in the acute setting. It is increasingly used in both prehospital and community settings. Any observation system should be used as an aid to clinical assessment and can never fully replace clinical judgement or concern.

A systematic review that included seven studies in the prehospital setting and 13 in the emergency department setting was inconclusive in favouring any one scoring system over another in either patient setting.[16] In prehospital settings NEWS2 and NEWS (when applied at high thresholds) were comparable in identifying short-term (3 days) mortality but could not predict 30-day mortality. In addition, the predictive ability of these scores did not progressively increase in a consistent manner when increasing thresholds were applied. Although NEWS2 and NEWS were comparable in predicting 30-day mortality in emergency department settings, no clear thresholds were identified. 2+

There were no comparator studies in the community or inpatient healthcare setting.

Scoring systems require healthcare professionals to be familiar with their application and meaning. In the absence of clear superiority of one scoring system over another, maintaining the status quo will maintain familiarity with, and reduce the need for, new training and embedding of learning. Universal adoption of a single scoring system across prehospital, community and secondary care settings may reduce variance and help with training and embedding into practice. Over-reliance on early warning scores to predict deterioration may falsely reassure clinicians or fail to identify at-risk patients.

R C **NEWS2 should be used to monitor all acutely ill adult patients in prehospital, emergency department, acute hospital and community settings.**

5 Sepsis

5.1 Secondary healthcare settings

The Academy of Medical Royal Colleges (AoMRC) 2022 'Statement on the initial antimicrobial treatment of sepsis'[17] – endorsed by a wide range of national stakeholders, including the Scottish Antimicrobial Prescribing Group and the Scottish Intensive Care Society and with a number of Scottish representatives in the working group – includes all the available studies on timing of antimicrobials. The paper relates to adult patients presenting with sepsis and septic shock in the emergency department or hospital setting. The AoMRC working group unanimously agreed on changing the timing of the first administration of antimicrobials in the context of sepsis, basing the urgency of treatment on an assessment of illness severity using vital signs summarised where possible by NEWS2 scores. This may affect how the Sepsis Six clinical care bundle is delivered. 4

The change in timing of initial antimicrobial has the advantages of treating infections based on severity of illness, reducing antimicrobial consumption in those patients who present with a sepsis-like illness but in whom further investigations reveal another primary diagnosis, reducing the use of broad-spectrum antimicrobials and increasing the use of targeted antimicrobials in patients who present with sepsis. Patients who are acutely unwell with septic shock or sepsis with multiorgan failure will still receive timely antimicrobials. The evidence shows that timely antimicrobials related to NEWS scores does not increase mortality or adversely affect outcomes. Economically, the reduced use of broad-spectrum antimicrobials, as well as judicious use of these in stable patients, should result in a reduction in total antimicrobial usage for patients presenting with sepsis in hospital or emergency department. There will, however, be some patients with sepsis who will not show signs of severe illness and who could be disadvantaged in not receiving appropriate timely antimicrobials.

In patients who are documented to be actively dying, the advent of sepsis may be a terminal event and intervention has the potential to be of low benefit or harmful. Decisions for not treating will need to be documented in the medical notes and TEP.

RE

The management of the deteriorating adult patient with a suspicion of sepsis within the emergency department and hospital setting should be based on the National Early Warning Score 2 (NEWS2).

The clinical decision support framework developed by AoMRC should be used. The framework provides a severity score based on NEWS2 bands of 0, 1–4, 5–6 and ≥7. This severity score should be interpreted in the light of clinical assessment, rapidity of deterioration, likely diagnosis, immune status and evidence of organ dysfunction.

At time zero, defined as the time of the first NEWS2 assessment on presentation to the emergency department or ward deterioration, the administration of appropriate antimicrobials should be completed within:

- **6 hours of recording a NEWS2 score of 1–4 for patients with possible infection**
- **3 hours of recording a NEWS2 score of 5–6 for patients with probable infection, or**
- **1 hour of recording a NEWS2 score ≥7 for patients with definite infection.**

Consult local antimicrobial policy for empirical therapy.

This stratification for the timing of initial antimicrobial based on NEWS2 will allow the prescriber to have more diagnostic information on which to base the choice of antimicrobial so as to target the organism(s) most likely involved.

5.2 Community and primary care

There is no robust evidence to guide the use of the AoMRC approach within the community or in primary care.

✓ The AoMRC clinical decision support framework should be extended to such instances when the right monitoring of antimicrobials is available within community or primary care.

6 Response to deterioration

6.1 Structured response tools

Quality improvement programmes have proposed that the response to a deteriorating patient by acute care staff who are based outside of critical care settings could be improved by using a specific structure that could take the form of a checklist or standardised proforma, such as the Scottish Patient Safety Programme (SPSP) Principles of Structured Response. Conceptually, such tools may improve the reliability of care and the early identification of goals of care.

The evidence base for structured response tools is minimal. A high-quality systematic review was inconclusive in its findings because of the poor quality of evidence available.[18] Studies included were inconsistent in outcomes, members of the response team and the content of the response. Some small, low-quality studies included showed a reduction in cardiac arrests. However, the studies included were consistent in their finding that social, environmental and professional behaviours, not just the intervention alone, play a role. A narrative review showed that having defined thresholds for escalating to a structured response can remove some barriers to escalation, such as a staff member's perceived need to justify escalation decision, with a potential benefit to safety culture.[19] A structured response tool could result in generating workload if thresholds for activating the response team are set incorrectly. Finally, a case study used increased numbers of unplanned intensive care unit (ICU) admissions and increased numbers of inappropriate DNACPR decisions as balancing measures, but these did not increase during the study.[20] 2++ 2+ 3

R C **Use of a structured response tool could be considered for deteriorating patients in hospital. The structured response does not replace clinical judgement, but can outline elements required, such as minimum frequency of observations, time to review by an appropriate healthcare professional and what to do if the patient deteriorates despite review.**

6.2 Critical care outreach teams

Many healthcare systems use either a nurse- or doctor-based rapid response team to respond to the deteriorating patient within secondary care. These teams are usually led or include those with critical care skills and are operated by the hospital's critical care service. They are often referred to as critical care outreach teams.

A systematic review concluded that much available evidence is of low quality.[21] Some, but not all, of the studies included showed a benefit. More studies suggested benefit in in-hospital surgical populations than other groups. The composition of the response team was not consistent across the included studies. 2++

A low-quality before-and-after study (Australian study of 296 patients) concluded that implementing medical emergency teams in a regional hospital was associated with reduced hospital-wide mortality rates, ICU admissions and cardiopulmonary arrests.[22] 3

R C **A critical care outreach team to support the response to the deteriorating patient in hospital settings should be considered. Where this is not possible, there should be clear escalation guidelines and a senior decision maker should be available to assist the deteriorating patient.**

6.3 Prehospital response

Within secondary care, scoring systems such as NEWS2 are widely used. These are accompanied by a plan that stipulates specific interventions for each level of NEWS2 score. This plan is termed a 'standardised clinical response' and may vary across specific hospital settings.

With the increasing adoption of scoring such as NEWS2 within primary care and community settings, it has been proposed that similar standardised clinical response tools could be adapted for these healthcare settings. Presently, there is a lack of high-quality evidence for such interventions in these settings.

The evidence, consisting of one RCT,[23] a high-quality systematic review,[24] a well-conducted cohort study,[25] a cross-sectional appraisal[26] and a cross-sectional study,[27] was inconclusive. In addition, consensus could not be reached on the use of a standardised clinical response tool in primary care. 1+ 2+ 3

7 Handover communication

Handover is universally accepted as best practice and is recommended as such by international bodies such as the World Health Organization.[28] Most Scottish healthcare settings already use some form of a formal handover tool and their use is encouraged in the interest of patient safety. These can be used within specific care settings or for transitions between care settings, such as between paramedic and emergency medicine staff on arrival at hospital.

The evidence reviewed (all from hospital settings) does not robustly support structured handovers, with no impact on defined outcomes such as mortality reported, but it does indicate that, overall, handovers are a positive aspect of care and that structured handovers improve communication in terms of the quality and quantity of information handed over.[29–31] Theoretically, harm could arise from a poor-quality or excessively long handover. There was no evidence on the use of structured handovers in community settings, and none of the studies involved patient satisfaction or feedback as an outcome. 1+ 2++

Despite this lack of clear evidence of benefit, the group considered the use of structured handover to be best practice in all care settings and between care settings.

R C **Standardised structured handovers should be used in all areas of clinical care.**

R C **Development of checklists appropriate to the clinical setting and workload should be considered as an aide memoire when needed alongside a structured handover.**

8 Provision of information

This section reflects the issues likely to be of most concern to patients and their carers. These points are provided for use by health professionals when discussing management of deterioration with patients and carers and in guiding the development of locally produced information materials.

8.1 Publications from SIGN

SIGN plain language summaries of guidelines are documents that 'translate' guideline recommendations and their rationales, originally developed for healthcare professionals, into a form that is more easily understood and used by patients and the public. They are intended to:

- help patients and carers understand what the latest evidence supports around diagnosis, treatment and self care
- empower patients to participate fully in decisions about management of their condition in discussion with healthcare professionals
- highlight for patients where there are areas of uncertainty.

The plain language summary of this guideline is available from the patient publications page of the SIGN website.

8.2 Sources of further information

Organisations

ICUsteps
Kemp House, 152–160 City Road, London EC1V 2NX
Tel: 0300 302 0121
contact@icusteps.org
www.icusteps.org

ICUsteps is a charity run by former intensive care patients and their relatives. They aim to improve the care and support available to people recovering from critical illness during their recovery.

NHS 24
Tel: Freephone 111
www.nhs24.scot

NHS 24 is an online and out-of-hours phone service providing the Scottish people with access to health advice and information 24 hours a day, 365 days a year.

NHS Inform
Tel: 0800 224 488
www.nhsinform.scot

NHS Inform provides health information for anyone living in Scotland. They have a helpline for questions about health and local NHS services.

Breathing Space
Tel: 0800 838 587
www.breathingspace.scot

Breathing Space is a free confidential phone and webchat service for anyone in Scotland over the age of 16 experiencing low mood, depression or anxiety.

Health in Mind
40 Shandwick Place, Edinburgh EH2 4RT
Tel: 0131 225 8508
hello@health-in-mind.org.uk
www.health-in-mind.org.uk

Health in Mind is a mental health charity that offers a pathway of services to support people with a range of mental health problems. They offer support over the phone, online or in person either individually or in a group setting.

Mental Health Foundation
McLellan Works, 1st Floor, Suites 1–4, 274 Sauchiehall Street, Glasgow G2 3EH
Tel: 020 7803 1100 (London Head Office)
scotland@mentalhealth.org.uk
www.mentalhealth.org.uk

The Mental Health Foundation is a UK-wide charity, focusing on a public mental health approach to prevention and finding solutions to mental health issues to provide a mentally healthy society for all.

SAMH
Brunswick House, 51 Wilson Street, Glasgow G1 1UZ
Tel: 0344 800 0550
info@samh.org.uk
www.samh.org.uk

Scottish Association for Mental Health is a mental health charity, operating over 70 services in communities across Scotland. They provide mental health social care support, amongst other services.

Useful resources for healthcare professionals

Effective Communication for Healthcare (EC4H)
Home – EC4H

Scotland's leading NHS communication programme provides a range of resources on effective clinical communication.

Supportive and Palliative Care Indicators Tool (SPICT)
SPICT – Supportive and Palliative Care Indicators Tool

SPICT helps identify people with deteriorating health due to advanced conditions or a serious illness, and prompts holistic assessment and future planning.

Useful resources for healthcare professionals, patients and families

ReSPECT
ReSPECT Resources | Resuscitation Council UK

The ReSPECT process creates personalised recommendations for a person's clinical care and treatment in a future emergency in which they are unable to make or express choices. These recommendations are created through conversations between a person, their families and their healthcare professionals to understand what matters to them and what is realistic in terms of their care and treatment. ReSPECT provides a range of resources to support patient decision making.

8.3 Checklist for provision of information

This section gives examples of the information patients and carers may find helpful at the key stages of the patient journey. The checklist was designed by members of the guideline development group based on their experience and their understanding of the evidence base. The checklist is neither exhaustive nor exclusive.

Planning and decision making

- Healthcare professionals should give information that patients and families can understand to help them participate in decision making.
- Options for treatment and care, including a focus on symptom management, should be discussed with patients and families.
- Explain to patients and families the escalation of care procedure in their particular healthcare setting (acute hospital, community care facility and general practice) if monitoring highlights that their health is worsening.
- Any information given to patients and their families should take into account any religious, ethnic or cultural needs they have. Any additional factors, such as physical or learning disabilities, sight or hearing difficulties or difficulties reading or speaking English, should be taken into account.
- Manage family expectations surrounding the patient's care and timelines and allow time to answer questions they may have.
- Where a patient or family refuses treatment, alternative approaches should be explained.
- If relevant, explain why the patient might be moved to a different centre or hospital.
- Where the patient is dying explain to them and their family that intervention has the potential to be of low benefit or harmful.
- Information should be consistent and full at all times.

Recognition of clinical deterioration

- Explain to patients and families how the patient will be monitored and cared for should their health become worse.
- Ask for the opinions of patients and their families when assessing clinical deterioration. These conversations should not happen in the admission units.
- Discuss treatments with patients and their families and make sure they are provided with details of benefits and risks of different treatments.
- Discuss written monitoring plans with patients and their families, explaining which physiological observations should be taken and how often.
- Ask patients and families about mental health issues or deterioration and offer advice on where they can access support.
- Explain how a treatment escalation plan and anticipatory care plan can help guide decisions about treatment and care, including when a patient is deteriorating and dying.
- The above information should be repeated as necessary.

Suspicion of sepsis

- Offer a calm and clear explanation of sepsis and emphasise that it is not necessarily fatal if the patient has it.
- In patients who are prescribed antimicrobials, explain the timelines for administration.

Response to deterioration

- Explain that there will be a structured response and what this involves.
- Where the patient is at the end of life, explain to them and their family that intervention has the potential to be non-beneficial or even harmful.

9 Implementing the guideline

This section provides advice on the resource implications associated with implementing the clinical recommendations, and advice on audit as a tool to aid implementation.

9.1 Implementation strategy

Implementation of national clinical guidelines is the responsibility of each NHS board, including health and social care partnerships, and is an essential part of clinical governance. Mechanisms should be in place to review care provided against the guideline recommendations. The reasons for any differences should be assessed and addressed where appropriate. Local arrangements should then be made to implement the national guideline in individual hospitals, units and practices.

Implementation of this guideline will be encouraged and supported by SIGN. SPSP will draw on the guideline to inform improvement work to support timely recognition, response and review of deteriorating patients.

9.2 Resource implications of recommendations

Training: there will be a requirement to ensure adequate training for healthcare professionals in the recognition of and response to deteriorating patients, as well as monitoring continuing competency. Training will also be required to ensure effective communication at times of deterioration in the patient, including training on ACPs and TEPs.

Staffing: there will be a requirement to ensure adequate levels of appropriately qualified staff to detect and respond to deteriorating patients.

Electronic track, trigger and alert systems: there are likely to be resource implications in introducing new electronic systems. There may be more opportunity in a gradual shift towards electronic observation.

Critical care outreach teams: introduction of critical care teams may have resource implications in terms of additional or redeployed staff.

No recommendations are considered likely to reach the £5 million threshold which warrants resource impact analysis.

9.3 Auditing current practice

A first step in implementing a clinical practice guideline is to gain an understanding of current clinical practice. Audit tools designed around guideline recommendations can assist in this process. Audit tools should be comprehensive but not time consuming to use. Successful implementation and audit of guideline recommendations requires good communication between staff and multidisciplinary team working.

The guideline development group has identified the following as key points to audit to assist with the implementation of this guideline:

- Appropriate use of NEWS2
- Clinical response to NEWS2
- Community – use and quality of ACPs
- Community – standardised checklists
- The use of critical care outreach teams
- Appropriate use of TEPs
- Appropriate use of ACPs

10 The evidence base

10.1 Systematic literature review

The evidence base for this guideline was synthesised in accordance with SIGN methodology. A systematic review of the literature was carried out using an explicit search strategy devised by a SIGN Evidence and Information Scientist. Databases searched include Medline, Embase and the Cochrane Library. The year range covered was 2000 to 2022. Internet searches were carried out on various websites for relevant guidelines. The main searches were supplemented by material identified by individual members of the development group. Each of the selected papers was evaluated by two Evidence and Information Scientists using standard SIGN methodological checklists before conclusions were considered as evidence by the guideline development group.

The search strategies are available on the SIGN website, www.sign.ac.uk

10.1.2 Literature search for patient issues

At the start of the guideline development process, a SIGN Evidence and Information Scientist conducted a literature search for qualitative and quantitative studies that addressed patient issues of relevance to deterioration. Databases searched include Medline and PsycINFO, and the results were summarised by the SIGN Patient Involvement Advisor and presented to the guideline development group.

10.1.3 Literature search for cost-effectiveness evidence

The guideline development group identified key questions with potential cost-effectiveness implications, based on the following criteria, where it was judged particularly important to gain an understanding of the additional costs and benefits of different treatment strategies:

- treatments which may have a significant resource impact
- opportunities for significant disinvestment or resource release
- the potential need for significant service redesign
- cost-effectiveness evidence could aid implementation of a recommendation.

A systematic literature search for economic evidence for these questions was carried out by a SIGN Evidence and Information Scientist covering the years 2000–2022. Databases searched include Medline, Embase and Research Papers in Economics (RePEc). Each of the selected papers was reviewed by a Health Economist, and considered for clinical relevance by guideline group members.

Interventions are considered to be cost effective if they fall below the commonly accepted UK threshold of £20,000 per Quality-Adjusted Life Year (QALY).[32]

10.2 Recommendations for research

The guideline development group was not able to identify sufficient evidence to answer all of the key questions asked in this guideline *(see Annex 1)*. The following areas for further research have been identified:

- The use of manual versus electronic recording, transcribing and charting of observations. Given the financial cost of electronic systems, research should also be conducted on the economic impact of these systems.
- Prospective studies of electronic versus manual escalation of care in various healthcare settings (primary and secondary care) and an economic analysis of these interventions.

- Predictive ability of NEWS2 versus other scoring systems in prehospital, emergency department, inpatient and community settings, and optimal thresholds to apply in these settings.
- The management of sepsis and deteriorating patients in the out-of-hospital (community/primary care) setting.
- Audits and quality improvement projects on sepsis in the acute secondary care setting to obtain data on adherence to the AoMRC clinical decision support framework and the resulting mortality and morbidity.
- Qualitative research comparing the use of ACP with DNACPR alone.
- Longitudinal observational studies on the perceived positive impact of structured handover tools in both community and hospital settings, as well as the interface between the two.

10.3 Review and updating

This guideline was issued in 2023 and will be considered for review in 3 years. The review history, and any updates to the guideline in the interim period, will be noted in the update report, which is available in the supporting material section for this guideline on the SIGN website: www.sign.ac.uk

Comments on new evidence that would update this guideline are welcome and should be sent to the SIGN Executive, Gyle Square, 1 South Gyle Crescent, Edinburgh, EH12 9EB
(email: sign@sign.ac.uk).

11 Development of the guideline

11.1 Introduction

SIGN is a collaborative network of clinicians, other healthcare professionals and patient organisations and is part of Healthcare Improvement Scotland. SIGN guidelines are developed by multidisciplinary groups of practising healthcare professionals using a standard methodology based on a systematic review of the evidence. Further details about SIGN and the guideline development methodology are contained in 'SIGN 50: A Guideline Developer's Handbook', available at www.sign.ac.uk

This guideline was developed according to the 2019 edition of SIGN 50.

11.2 The guideline development group

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The membership of the guideline development group was confirmed following consultation with the member organisations of SIGN. All members of the guideline development group made declarations of interest. A register of interests is available in the supporting material section for this guideline at www.sign.ac.uk.

Guideline development and literature review expertise, support and facilitation were provided by SIGN Executive and Healthcare Improvement Scotland staff. All members of the SIGN Executive make yearly declarations of interest. A register of interests is available on the contacts page of the SIGN website www.sign.ac.uk.

Igor Brbre	Evidence and Information Scientist
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Kirsty Littleallan	Distribution Co-ordinator
Gaynor Rattray	Guideline Co-ordinator
Domenico Romano	Publications Designer
Zoe Seatter	Project Officer

11.2.1 Acknowledgements

SIGN would like to acknowledge the guideline development group responsible for the development of SIGN 139: Care of Deteriorating Patients, on which this guideline is based.

11.3 The consensus methodology

11.3.1 The Delphi process

The consensus recommendations (marked by **C**) in this guideline were developed by a multidisciplinary group of practising healthcare professionals and patient and public representatives using a modified Delphi process. The Delphi process is a methodology designed to reach a group opinion or consensus without the drawbacks inherent within a face-to-face group process. Delphi has been shown to be more accurate than focus groups, conferences, group discussions and other traditional interactive group processes.[33] The modified Delphi process used was a multistaged survey with feedback of group results at each stage in the process. Consensus was deemed to have been reached when 70% of the group either agreed or disagreed on a question.

11.3.2 Participation and response rate

Potential participants were identified through professional networks. To ensure the independence of the responses, group membership was not disclosed to participants during the Delphi process. Email communications were dealt with in a way that ensured no group member saw the email address of another group member and written responses to the questionnaires were anonymised when fed back to the group.

Thirty-eight participants were invited to take part in the modified Delphi process. Sixteen responded to the first survey and 14 responded to the second survey. Sixteen participants did not respond to either survey.

The results of rounds 1 and 2 can be found in the supporting material section for this guideline on the SIGN website: www.sign.ac.uk.

11.3.3 The consensus group

The consensus group consisted of a representative sample of experts made up of doctors, nurses, other relevant allied health professionals and patient and public representatives.

Group membership was anonymous to allow each participant an equal voice and to encourage the broadest possible opinion. All members of the consensus group made declarations of interest. A register of interests is available in the supporting material section for this guideline at www.sign.ac.uk.

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Dr Ivan Tonna	Consultant in Infectious Diseases and General Medicine, Aberdeen Royal Infirmary
Mrs Lynn Williams	Patient Representative, Paisley

11.4 Consultation

A report of the consultation comments and responses is available in the supporting material section for this guideline on the SIGN website. All contributors made declarations of interest and further details of these are available on request from the SIGN Executive.

11.4.1 Public consultation

The draft guideline was available on the SIGN website for two weeks to allow all interested parties to comment.

11.4.2 SIGN editorial group

As a final quality control check, the guideline is reviewed by an editorial group comprising the relevant specialty representatives on SIGN Council to ensure that the consultation comments have been addressed adequately and that any risk of bias in the guideline development process as a whole has been minimised. The editorial group for this guideline was as follows. All members of SIGN Council make yearly declarations of interest. A register of interests is available on the SIGN Council Membership page of the SIGN website www.sign.ac.uk.

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Dr Roberta James	SIGN Programme Lead; Co-Editor
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Professor Angela Timoney	Chair of SIGN; Co-Editor

Abbreviations

ACP	anticipatory care plan
AoMRC	Academy of Medical Royal Colleges
CCOT	critical care outreach team
DNACPR	do not attempt cardiopulmonary resuscitation
ICU	intensive care unit
IT	information technology
NEWS	National Early Warning Score
NICE	National Institute for Health and Care Excellence
SIGN	Scottish Intercollegiate Guidelines Network
SPSP	Scottish Patient Safety Programme
TEP	treatment escalation plan

Annex 1

Key questions addressed in this update

This guideline is based on a series of structured key questions that define the target population, the intervention, diagnostic test, or exposure under investigation, the comparison(s) used and the outcomes used to measure efficacy, effectiveness or risk. These questions form the basis of the systematic literature search.

Section	Key question
2.1	In acutely ill adult patients, how do documented anticipatory care plans compare with usual care in the effect on rates of cardiac arrest within 28 days, documentation of escalation plans and rates of medical complaints?
2.2	In acutely ill adult patients, how do treatment escalation plan proformas compare with usual care in the effect on rates of cardiac arrest within 28 days, documentation of escalation plans and rates of medical complaints?
3.1	In acutely ill adult patients, how does electronic observation recording compare with manual recording in the effect on outcomes such as mortality at 28 days?
3.1	In acutely ill adult patients, how does electronic transcription of observations compare with manual transcription in the effect on outcomes such as mortality at 28 days?
3.1	In acutely ill adult patients, how does electronic charting of observations compare with paper-based charting of observations in the effect on outcomes such as mortality at 28 days?
3.2	In acutely ill adult patients, how does automated escalation of care compare with manual escalation of care in the effect on outcomes such as mortality at 28 days?
4	In acutely ill adult patients, how does the National Early Warning Score 2 (NEWS2) compare with other early warning scores, and the concerns of clinicians, patients or carers, in predicting outcomes such as mortality at 28 days?
5	In acutely ill adult patients, how does a risk-stratified approach to sepsis antimicrobial management compare with 1-hour sepsis antimicrobial strategies in the effect on outcomes such as admission to critical care units, duration of hospital admission, mortality at 28 days and morbidity after 28 days?
5	In adult patients with septic shock, how does the Sepsis Six clinical care bundle compare with usual care in the effect on outcomes such as admission to critical care units, duration of hospital admission, mortality at 28 days and morbidity after 28 days?
6.1	In acutely ill adult patients, how do generic or structured response tools compare with usual care in the effect on rates of cardiac arrest within 28 days?
6.2	In acutely ill adult patients in hospital, how do critical care outreach teams and medical emergency teams compare with usual care in the effect on outcomes such as mortality and rates of cardiac arrest within 28 days?
6.3	In acutely ill adult patients within primary care and community settings, how do prehospital response teams using a standardised clinical response tool affect outcomes?
7	In acutely ill adult patients, how do structured clinical handovers compare with usual care in the effect on outcomes such as timely access to definitive care, rates of cardiac arrest and rates of medical complaints?

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