



*Scottish Intensive Care  
Society Audit Group*

# Minimum Standards and Quality Indicators for Critical Care in Scotland

Version 3.0  
December 2015

*Scottish Intensive Care Society  
Quality Improvement Group*



© NHS National Services Scotland/Crown Copyright 2015

Brief extracts from this publication may be reproduced provided the source is fully acknowledged. Proposals for reproduction of large extracts should be addressed to:

PHI Graphics Team  
NHS National Services Scotland  
Gyle Square  
1 South Gyle Crescent  
Edinburgh EH12 9EB

Tel: +44 (0)131 275 6233

Email: [nss.phigraphics@nhs.net](mailto:nss.phigraphics@nhs.net)

**Designed and typeset by:**

Chris Dunn, PHI Graphics Team

**Translation Service**

If you would like this leaflet in a different language, large print or Braille (English only), or would like information on how it can be translated into your community language, please phone 0845 310 9900 quoting reference 287407.



# Contents

<b>Introduction .....</b>	<b>1</b>
<b>Aims and definitions .....</b>	<b>2</b>
<b>Section 1: Structure .....</b>	<b>4</b>
1.1 Units participate in a national comparative audit.....	4
1.2 Daily review and written management plan by an appropriately trained consultant .....	4
1.3 Twice Daily Ward Rounds .....	5
1.4 Nursing Staffing and Skill Levels in Critical Care .....	5
1.5 Pharmacist in Critical Care .....	6
1.6 Physiotherapist in Critical Care .....	6
1.7 Healthcare Associated Infection (HAI) surveillance system .....	7
<b>Section 2: Process .....</b>	<b>8</b>
2.1 Night time discharges from critical care .....	8
2.2 Care bundles are in place for: (a) Intubation Associated Pneumonia (IAP) prevention, (b) Central Venous Catheter (CVC) insertion and maintenance, (c) Peripheral Venous Cannula (PVC) insertion and maintenance .....	9
2.3 Tracheostomy communication and swallowing needs assessed in Critical Care .....	9
2.4 Screening for Delirium in Critical Care .....	10
2.5 Rehabilitation Needs in Critical Care .....	11
2.6 End of Life Care .....	12
<b>Section 3: Outcomes .....</b>	<b>13</b>
3.1 Standardised Mortality Ratio (SMR).....	13
3.2 Early discharges from Critical Care .....	14



- 3.3 All unit deaths and significant adverse events are discussed at a multidisciplinary clinical governance meeting ..... 15
- 3.4 Units should undertake regular patient/family experience surveys .. 16

**References ..... 17**

**Appendix ..... 20**

Editorial Team .....20

Members of the Scottish Intensive Care Society Quality Improvement Group (SICS QIG).....20

# Introduction

Written by the **Scottish Intensive Care Society (SICS) Quality Improvement Group (QIG)** (Please see Appendix for the full Membership list of the review group).

This is the first in depth review of the Minimum Standards and Quality Indicators that were initially written and published in 2011.<sup>1</sup> Our aim has been to quantify, document and where possible, improve the quality and standards of Critical Care provided throughout Scotland. We now report in a unit identifiable and transparent manner on these indicators in detail as a routine part of the SICSAG annual report.

The Scottish Intensive Care Society Audit Group (SICSAG) has reported on ICU activity and outcomes since 1995. We have worked with the Scottish Critical Care Community, Public Health and Intelligence (part of NHS National Services Scotland), the Clinical Outcome Measures for Quality Improvement (COMQI) working group and with the Scottish Government to promote patient safety and to improve quality outcomes.

Since the initial indicators were published there have been some new developments particularly with the recent publication by the Intensive Care Society (ICS) and the Faculty of Intensive Care Medicine (FICM) of Guidelines for the Provision of Intensive Care Services documents (GPICS).<sup>2</sup> These also have a number of core standards embedded within them and so it seems reasonable at this time of detailed review to try to align the English and Welsh standards with the Scottish standards wherever appropriate.

Through this process, we have developed robust measurable markers of quality within Critical Care. Other groups such as the Scottish Patient Safety Programme (SPSP) and Healthcare Improvement Scotland have also fed in to this process.

The SICS Quality Improvement Group review has taken place between August and October 2015.

All the current standards and quality indicators have now been extensively reviewed and wherever possible, aligned with those produced south of the border.

These Standards and Quality Indicators are defined as being person centred, safe, effective, evidence based, equitable and timely and are in line with the **Route Map to the 2020 Vision for Health and Social Care by NHSScotland**.<sup>3</sup> The indicators that we have published in this document will, in many cases, be aspirational and searching but they strive to meet these challenging criteria.



## Aims and definitions

The **Minimum Standards and Quality Indicators** are presented as a suite of measurement tools for local implementation and local improvement. The nature of the Scottish Critical Care Community has long been unified in how we measure quality and for this reason we aim to produce a single set of Standards and Quality Indicators that can be used by all Scottish Critical Care units and collected for individual patients at local unit level.

There are clear distinctions between the 2 sets of definitions within this publication.

**1. Minimum Standard** – this is the measurement of a **structure, process or outcome**, that is viewed as an assurance to patients, the public and clinicians that certain quality standards are being measured with local endeavours to maintain and improve them.

**2. Quality Indicator** – this is a measure of a structure, process or outcome that could be used by local teams to improve care. The reason this is viewed as an Indicator and not a Minimum Standard is that our experience in using this as a measure for driving improvement is less established because these are areas with interdependent relationships, (for example discharges from Intensive Care down to lower levels of care). These indicators are more difficult to change, as they often require a **whole hospital, Health Board or regional approach**.

A Quality Indicator helps in understanding a system, the ability to compare it with others and then to improve it. All Quality Indicators have their limitations and they can only serve as flags or pointers, which summarise and prompt questions about complex systems of clinical care and they must be understood in that context. We also acknowledge that some Quality Indicators for Intensive Care may not be relevant to lower levels of care such as High Dependency; equally some may be viewed as Minimum Standards for level 3 Intensive Care patients and as Quality Indicators for High Dependency Units.

These Minimum Standards and Quality Indicators should all be **measurable, realistic and achievable**. For many, they will be stretching and we recognise fully that these are **aspirational** in many cases.

Finally we present the Scottish Critical Care Quality Indicators in three groups.

- 1. Structure**
- 2. Process**



### 3. Outcome

For the first time in this report we have developed Quality Indicators and Standards based on the needs of other members of the multidisciplinary team such as **Allied Health Professionals** and **Nursing staff** within the Critical Care community.



## Section 1: Structure

### 1.1 Units participate in a national comparative audit

**All Scottish Critical Care Units (ICUs and HDUs) should provide demonstrable resources to participate in and submit accurate data to the Scottish Intensive Care Society Audit Group.**

**Indicator Type:** Minimum Standard.

**Data Collection:** Data extract from WardWatcher by SICSAG.

**Rationale:** The SICSAG audit is the only national benchmarking structure in Scotland. It is already virtually 100% inclusive of all critical care level 2 and 3 patients. This was recommended as a standard in the Scottish Medical and Scientific Advisory Committee report: HDU beds.<sup>4</sup>

### 1.2 Daily review and written management plan by an appropriately trained consultant

**All patients in ICU or Combined ICU/HDU should be seen every day by an appropriately trained consultant who has regular weekday commitments to intensive care.**

**All patients in HDU are seen every day by an appropriately trained consultant. This may be a Critical Care consultant or another medical or surgical specialty depending on the service model for a particular unit.**

**Indicator Type:** Minimum Standard.

**Data Collection:** Annual survey to unit leads by SICSAG.

**Rationale:** We recognise that continuity of care and setting management goals are important. This reinforces the GPICS recommendations, which recognise the importance of staffing patterns on outcome. Some evidence exists, mainly from the USA, where extremes of staffing models show that “closed” ICU’s have better outcomes.<sup>5</sup>



### 1.3 Twice Daily Ward Rounds

All patients admitted to Critical Care should be seen within 12 hours by an appropriately trained consultant. Documented Consultant-led twice daily ward rounds should take place.

**Indicator Type:** Minimum Standard.

**Data Collection:** Annual survey to unit leads by SICSAG.

**Rationale:** is group represents the sickest groups of patients in the hospital and regular detailed consultant led review has been suggested to influence length of stay and patient outcomes.<sup>6</sup>

### 1.4 Nurse Staffing and Skill Levels in Critical Care

Nurse staffing levels depend on the level of care (level guided by ICS levels of care) of patients and are calculated on the basis of the whole time equivalents (WTE) required to meet this need. This calculation will vary in each Critical Care area depending on local context and should allow for flexibility to respond to changes in demand.<sup>7, 8</sup>

Critical Care Units should deliver care using only appropriately trained and experienced registered nursing staff,<sup>7, 8</sup> and all nursing staff appointed to Critical Care will be allocated a period of supernumerary practice.<sup>2</sup>

**Indicator Type:** Quality Indicator.

**Data Collection:** Annual survey of nurse staffing levels on each unit by SICSAG.

**Rationale:** The links between nursing resources and patient outcomes and safety are widely known.<sup>9</sup> The effective use of experienced Critical Care nurses can greatly improve patient care, and reduce the incidence of complications for patients.<sup>10, 11</sup>

Appropriately trained and experienced registered nursing staff is Critical Care's greatest asset and it is known to be associated with quality of care and improved patient outcomes.<sup>12</sup>



## 1.5 Pharmacist in Critical Care

**All patients in Critical Care areas should be seen every day by a recognised Critical Care pharmacist, or by a suitably trained pharmacist with access to a fully trained Critical Care pharmacist.**

**Indicator Type:** Quality Indicator.

**Data Collection:** Annual survey to unit leads by SICSAG.

**Rationale:** Pharmacist input to critical care improves efficiency and safety.<sup>13</sup> Further background relating to the organisation of pharmacy services is detailed in GPICS.<sup>2</sup> The service should ideally be available seven days per week, but as a minimum should be provided five days per week.

## 1.6 Physiotherapist in Critical Care

**Physiotherapy staffing should be adequate to provide the respiratory management and rehabilitation components of care.**

**Physiotherapy should be available 24 hours a day if required, dependent on patient need. A senior clinical physiotherapist should lead the team.**

**Indicator Type:** Quality Indicator.

**Data Collection:** Annual survey of physiotherapy staffing levels on each unit by SICSAG.

**Rationale:** Physiotherapy should be available 24 hours a day if required, dependent on patient need.<sup>2, 14</sup>

Physiotherapy staffing should be adequate to provide both the respiratory management and rehabilitation components of care.<sup>2, 14</sup>



## 1.7 Healthcare Associated Infection (HAI) surveillance system

ICU and HDUs should have an HAI surveillance system in place, which reports incidence of important infections on a monthly basis to unit staff, SPSP and local Quality Improvement Database Systems (QIDS).

**ICUs and Combined ICU/HDUs** report incidence of Intubation Associated Pneumonia (IAP), Catheter Related Bloodstream Infection (CRBSI) and Blood Stream Infection (BSI).

**HDUs** report incidence of Catheter Related Bloodstream Infection (CRBSI) and Blood Stream Infection (BSI).

**Indicator Type:** Minimum Standard.

**Data Collection:** Data extract from WardWatcher or HELICSwIn software.

**Rationale:** These HAIs are important, measurable and, with an effective quality improvement programme, can be reduced. The SPSP and SICSAG have introduced these nationally in conjunction with care bundles<sup>15 16, 17</sup> to reduce infection rates since 2008.

Note: Ventilator Acquired Pneumonia (VAP is now defined as Intubation Acquired Pneumonia (IAP)



## Section 2: Process

### 2.1 Night time discharges from Critical Care

All Scottish ICUs and HDUs should participate in, and submit data to, the Scottish Intensive Care Society Audit Group to measure night time discharges. The aim is to encourage and support local improvement to reduce night time critical care discharges.

**Indicator Type:** Minimum Standard.

**Denominator:** All live unit discharges.

**Numerator:** Discharges between **22:00** and **08:00** hours.

**Data Collection:** Data extract from WardWatcher by SICAG.

**Rationale:** Night time discharges from intensive care units are associated with worse outcomes.<sup>18,19</sup> Discharge from critical care to a ward is most safely performed during the day. Night time discharges are forced early discharges to accommodate another patient or delayed from earlier in the day due to inadequate ward beds. They may be poorly planned and/or communicated.

NICE Guideline 50: Acutely Ill Patients in Hospital 2007 recommended that this should be avoided.<sup>20</sup>



## 2.2 Care bundles are in place for: (a) Intubation Associated Pneumonia (IAP) prevention, (b) Central Venous Catheter (CVC) insertion and maintenance, (c) Peripheral Venous Cannula (PVC) insertion and maintenance

All ICUs and HDUs should measure and submit data to SPSP and feedback to unit staff on delivery of VAP prevention bundle<sup>15, 16, 21</sup> (ICU or Combined ICU/ HDU only), CVC insertion and maintenance bundle<sup>17</sup> and PVC insertion and maintenance bundle.

**Indicator Type:** Minimum Standard.

**Data Collection:** Annual survey to unit leads by SICSAG.

**Rationale:** Use of care bundles improves outcomes and is supported by international and Scottish studies for IAP<sup>22, 23</sup> and CRBSI.<sup>24, 25, 26</sup>

## 2.3 Tracheostomy communication and swallowing needs assessed in Critical Care

All patients with a tracheostomy should have communication and swallowing needs assessed when the decision to wean from the ventilator has been made and the sedation hold has started.<sup>2, 27</sup>

**Indicator Type:** Quality Indicator.

**Data Collection:** Agree and define local bundle and exclusion criteria and measure against this using all or none methodology<sup>28</sup>. Data collection verified by annual survey of each unit by SICSAG.

**Rationale:** Critical Care should have a Physiotherapist and access to a Speech and Language Therapist of adequate Critical Care experience and seniority who can help contribute to, or construct a suitable weaning plan for complex patients, in conjunction with the wider inter-professional team.

Critical Care should have access to a wide variety of high and low-tech communication aids. These should only be prescribed by a professional who is trained to apply and adapt them as required.



## 2.4 Screening for Delirium in Critical Care

**All patients in Critical Care will be screened for delirium at least once per day using a standardised screening tool.**<sup>2, 29, 30</sup>

**Indicator Type:** Quality Indicator.

**Data Collection:** Agree and define local bundle and exclusion criteria and measure against this using all or none methodology.<sup>22</sup> Data collection verified by annual survey of each unit by SICSAG.

**Rationale:** Delirium screening should be undertaken with a standardised assessment tool and use a multi-professional, multi-modal approach.

Interventions should include both pharmacological and non-pharmacological considerations. Highly and specifically trained Occupational Therapists; Psychologists; Pharmacists and Nursing staff should provide assessments and strategies for patients identified as suffering from delirium.

## 2.5 Rehabilitation Needs in Critical Care

**All patients, on discharge from critical care, should have an assessment of their rehabilitation needs, with quantified outcomes, using a tool that can track progression from the Acute Sector into Primary Care to facilitate care needs in the community.**<sup>2, 31</sup>

**Indicator Type:** Quality Indicator.

**Data Collection:** Agree and define local bundle and exclusion criteria and measure against this using all or none methodology.<sup>28</sup> Data collection verified by annual survey of each unit by SICSAG.

**Rationale:** Rehabilitation should be communicated verbally to the daily ward round for each patient receiving input. This should be ideally given by a Therapist of suitable seniority who understands the complexity of rehabilitation needs of critically ill patients and is able to explain and amend treatment goals/plans as discussed at the time of the ward round.

Outcome measure should be consistent throughout the patient's pathway and able to facilitate care needs assessments.

These outcomes should be reviewed consistently at follow-up appointments and discussed with the patient and primary carer.



## 2.6 End of Life Care

**All ICUs and HDUs should have a written end of life care policy.**

**Indicator Type:** Quality Indicator.

**Data Collection:** Annual survey to unit leads by SICSAG.

**Rationale:** As about 15-20% of patients admitted to an ICU will die in ICU or subsequently on the wards, good quality, individualised end of life care is an important part of the care delivered to those patients. There is evidence that patients dying in ICU can suffer pain and other distressing symptoms.<sup>32</sup> An end of life policy can help ensure that these symptoms are addressed. Areas that an end of life policy might include are: communication with patient, family and staff; spiritual care; modes of treatment withdrawal; symptom control; Do Not Attempt Cardio Pulmonary Resuscitation (DNACPR) status; and documentation.

The potential for organ and tissue donation should be considered in all deaths. If donation is a possibility there should be early referral to the Specialist Nurse for Organ Donation or tissue coordinator. Where brain stem death is suspected formal testing should be carried out according to national guidelines, whether or not organ donation is a possibility.

## Section 3: Outcomes

### 3.1 Standardised Mortality Ratio (SMR)

The SMR is the ratio between the observed (O) and the expected (E) hospital mortality rates. It is calculated for critical care patients after case mix and illness severity adjustment using a statistical model eg APACHE II. Reference to the mortality rates in the whole Scottish critical care population can be used to identify units which are statistical outliers. Unit identifiable SMRs are reported and published by SICSAG annually.

**Indicator type:** Minimum Standard.

**Data Collection:** Data extract from WardWatcher by SICSAG.

**Rationale:** Mortality for patients with similar illnesses of similar severity should be broadly comparable between units.

**Note:** Not applicable to HDUs as the statistical models are less well validated in this population and the diverse nature of the case mix in these units in Scotland renders any mortality outcome comparison difficult to interpret.

Not applicable to Cardiothoracic ICU as APACHE II excludes patients following coronary artery bypass grafts, which is a large proportion of their admissions.



### 3.2 Early discharges from Critical Care

**Early discharges from Critical Care may be a marker of insufficient resource.**

**This has been reported by SICSAG in annual reports for some years.**

**Indicator type:** Minimum Standard.

**Denominator:** All live unit discharges.

**Numerator:** All patients being assessed as having been discharged early by the discharging clinical team member.

**Data collection:** Data extract from WardWatcher by SICSAG.

**Rationale:** Early discharge from Critical Care is by definition unplanned, and usually forced by the need to admit another acutely ill patient. Patients who are judged as being discharged early from critical care units may not receive care at an appropriate level on ward areas. As a result their condition may deteriorate resulting in adverse outcomes.

### 3.3 All unit deaths and significant adverse events are discussed at a multidisciplinary clinical governance meeting

All critical care units should hold regular, structured multi-disciplinary meetings, which consider unit morbidity and mortality, encompassing all deaths, critical incidents and near misses. These should include cross-disciplinary meetings. A written record should be kept and a timely and reliable method for dissemination of shared learning should be in place.

**Indicator type:** Minimum standard.

**Data Collection:** Annual survey to unit leads by SICSAG.

**Rationale:** Regular review of any adverse events that occur and a systematic analysis into the care of **all** critically ill patients who have died is good reflective practice. The review should be conducted in an open and transparent manner in a non-adversarial forum free from blame.

The objectives are to learn from complications and errors, to modify decision-making, behaviour and judgment based on previous experiences, and to prevent repetition of errors leading to complications. When deficiencies in care are recognised and acted upon, such change can lead to measurable improvement.

**Shared learning** is important to provide feedback to all involved parties, improve complex and interlinked patient care and flag up learning points to a wider audience in a timely manner.



### 3.4 Units should undertake regular patient/family experience surveys

**Critical Care units should undertake patient/relative experience surveys on an annual (or more frequent) basis.**

**Indicator type:** Quality indicator.

**Data Collection:** Annual survey to unit leads by SICSAG.

**Rationale:** Family members appreciate timely and honest information, even if it is upsetting. Empathetic staff who relay clear and intelligible information can help meet the emotional needs of family members of critically ill patients. Assessing and analysing family experience in the ICU ultimately will support healthcare professionals in their continuing effort to improve care of critically ill patients and their families.<sup>33</sup>

## References

1. Scottish Intensive Care Society Quality Improvement Group (2012) Quality Indicators for Critical Care in Scotland Version 2.0, NHS National Services Scotland, Edinburgh [online]. Available at: <http://www.sicsag.scot.nhs.uk/quality/indicators.html> [last accessed 7 December 2015].
2. Faculty of Intensive Care Medicine (FICM) and the Intensive Care Society (ICS) (2015) Guidelines for the Provision of Intensive Care Services (GPICS) Edition 1, London [online]. Available at: <https://www.ficm.ac.uk/news-events/gpics-published-%E2%80%93-guidelines-icm-services-2015> [last accessed 7 December 2015].
3. NHS Scotland (2011) A Route Map to the 2020 Vision for Health and Social Care [online]. Available at: <http://www.gov.scot/Topics/Health/Policy/Quality-Strategy/routemap2020vision> [last accessed 7 December 2015].
4. The Scottish Government SMASAC report on HDU beds 2008 [online]. Available at: <http://www.scotland.gov.uk/Resource/Doc/924/0067746.pdf> [last accessed 7 December 2015].
5. Pronovost P, et al. (2002) Physicians staffing patterns and clinical outcomes in critically ill patients: a systematic review. *JAMA*, 288:2151-62.
6. Wilcox ME, et al. (2013) Do intensivists staffing patterns influence hospital mortality following ICU admission? A systematic review and meta-analysis. *Critical Care Medicine*, 41(10): 2253-2274.
7. British Association of Critical Care Nurses (BACCN) (2010) Standards for Nurse Staffing in Critical Care. British Association of Critical Care Nurses, The Critical Care Networks National Nurse Leads, and the Royal College of Nursing Critical Care Forum. Published September 2009, revised January 2010.
8. Royal College of Nursing (RCN) (2003) Guidance for nurse staffing in critical care. RCN, London. February 2003.
9. West E, et al. (2007) Nursing resources and patient outcomes in intensive care: A systematic review of the literature. *International Journal of Nursing Studies*, 46 (7):993-1011.
10. Francis R. (2013) Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry. The Stationary Office, London [online]. Available at: <http://webarchive.nationalarchives.gov.uk/20150407084003/http://www.midstaffpublicinquiry.com/report> [last accessed 7 December 2015].



11. Berwick Review (2013) A Promise to Learn – A Commitment to Act: Improving the Safety of Patients in England. Department of Health. 2013 [online]. Available at: <https://www.gov.uk/government/publications/berwick-review-into-patient-safety> [last accessed 7 December 2015].
12. Department of Health (2008) A High Quality Workforce: NHS Next Stage Review. Department of Health. London [online]. Available at: [https://www.webarchive.nationalarchives.gov.uk/20130107105354/http://dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_085840](https://www.webarchive.nationalarchives.gov.uk/20130107105354/http://dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_085840) [last accessed 7 December 2015].
13. Shulman R, et al. (2015) Pharmacists' Review and Outcomes: Treatment Enhancing Contributions Tallied, Evaluated and Documented (PROTECTED – UK), *Journal of Critical Care*, 30 (4):808-813.
14. National Institute for Health and Care Excellence (NICE) CG83 (2009) Rehabilitation after critical illness in adults' Clinical guideline. National Institute for Health and Care Excellence, Published: 25 March 2009, London [on line] Available at: <https://www.nice.org.uk/guidance/cg83> [last accessed 7 December 2015].
15. Beard D, et al. (2008) Scottish Intensive Care Society Audit Group VAP Prevention Bundle: Guidance for Implementation. Scottish Intensive Care Society Audit Group, Edinburgh [online]. Available at: [http://www.sicsag.scot.nhs.uk/SubGroup/VAP\\_Prevention\\_Bundle\\_Guidance\\_For\\_Implementation1.pdf](http://www.sicsag.scot.nhs.uk/SubGroup/VAP_Prevention_Bundle_Guidance_For_Implementation1.pdf) [last accessed 7 December 2015].
16. Beard D, et al. (2008) Scottish Intensive Care Society Audit Group VAP Prevention Bundle: Aide Memoire. Scottish Intensive Care Society Audit Group, Edinburgh [online]. Available at: [http://www.sicsag.scot.nhs.uk/SubGroup/VAP\\_Prevention\\_Bundle\\_Bedside\\_Aide\\_Memoire.pdf](http://www.sicsag.scot.nhs.uk/SubGroup/VAP_Prevention_Bundle_Bedside_Aide_Memoire.pdf) [last accessed 7 December 2015].
17. Scottish Intensive Care Society Audit Group (2012) Central Line Insertion Bundle – Version 2.0. Scottish Intensive Care Society Audit Group: Jan 2008, Edinburgh [online]. Available at: <http://www.sicsag.scot.nhs.uk/SubGroup/VAP-C-line-Bundle-080123.pdf> [last accessed 7 December 2015].
18. Goldfrad C & Rowan K (2000) Consequences of discharges from intensive care at night. *Lancet*, 355:1138-1142.
19. Tobin AE & Santamaria JD (2006) After-hours discharges from intensive care are associated with increased mortality. *Med J Aust*, 184:334-337.
20. National Institute for Health and Care Excellence (NICE) Guideline 50 (2007) Acutely Ill Patients in Hospital. National Institute for Health and Care Excellence, London [online]. Available at: <http://www.nice.org.uk/nicemedia/pdf/CG50FullGuidance.pdf> [last accessed 7 December 2015].



21. Morris AC, et al. (2011) Reducing ventilator-associated pneumonia in intensive care: Impact of implementing a care bundle. *Critical Care Medicine*, 39:2218-24.
22. Resar R, et al. (2005) Using a bundle approach to improve ventilator care processes and reduce ventilator-associated pneumonia. *Jt Comm J Qual Patient Saf*, 31:243-248.
23. Hawe C, et al. (2009) Reduction of Ventilator Associated Pneumonia: Active versus Passive Guideline Implementation. *Intensive Care Medicine*, 35(7):1180-1186.
24. Berenholtz SM, et al. (2004) Eliminating catheter-related blood stream infections in the intensive care unit. *Crit Care Med*, Oct; 32(10):2014-20.
25. Pronovost P, et al. (2006) An intervention to decrease catheter-related bloodstream infections in the ICU. *N Engl J Med*, 355:2725-32.
26. Longmate A, et al. (2011) Elimination of central venous catheter related blood stream infections from the intensive care unit. *BMJ Quality and Safety*, 20(2):174-180.
27. Royal College of Speech and Language Therapists (RCSLT) (2014) RCSLT position paper: Speech and language therapy in adult critical care. RCSLT, London [online]. Available at: [http://www.rcslt.org/speech\\_and\\_language\\_therapy/rcslt\\_position\\_papers](http://www.rcslt.org/speech_and_language_therapy/rcslt_position_papers) [last accessed 7 December 2015].
28. Nolan T & Berwick DM (2006) All-or-None Measurement Raises the Bar on Performance. *JAMA*, 295:1168-1170.
29. Ely EW, et al. (2004) Delirium as a Predictor of Mortality in Mechanically Ventilated Patients in the Intensive Care Unit. *JAMA*, 291(14):1753-1762.
30. Barr J, et al. (2013) Clinical Practice Guidelines for the Management of Pain, Agitation, and Delirium in Adult Patients in the Intensive Care Unit, *CCM*, 41(1):263-306.
31. National Institute for Health and Care Excellence (NICE) QS2 (2010) Quality Standards for Stroke, National Institute for Health and Care Excellence, London 2010 [online]. Available at: <https://www.nice.org.uk/guidance/qs2> [last accessed 7 December 2015].
32. Clarke EB, et al. Quality indicators for end-of-life care in the intensive care unit: on behalf of Robert Wood Johnson Foundation Critical Care End-Of-Life Peer Workgroup Members, *Critical Care Medicine* 31:2255-62.
33. Holden J, et al. (2002) Families, nurses and intensive care patients: a review of the literature, *Journal of Clinical Nursing*, 11: 140–148.



# Appendix

## Editorial Team

Dr Stephen Cole, Chairman SICSAG Consultant in Anaesthesia and Intensive Care Medicine, NHS Tayside,

Dr Charles Wallis, Vice- Chairman SICSAG Consultant in Anaesthesia and Intensive Care Medicine, NHS Lothian,

Mr Paul Smith, National Clinical Coordinator for SICSAG, NHS National Services Scotland.

Ms Clare McGeoch, Quality Assurance Manager for SICSAG, NHS National Services Scotland.

## Members of the Scottish Intensive Care Society Quality Improvement Group (SICS QIG)

Dr Jonathan Aldridge, Consultant Anaesthetics, NHS Borders

Dr Stephen Cole Chairman SICSAG, Consultant in Anaesthesia and Intensive Care Medicine, NHS Tayside, Chairman SICSAG

Dr Brian Cook, Associate Division Medical Director, Critical Care, NHS Lothian

Mr Euan Dickson, Surgeon, Glasgow Centre Lead, Scottish HepatoPancreatoBiliary Network (SHPBN), NHS Greater Glasgow & Clyde

Mr Duncan Ford, Senior Charge Nurse, NHS Fife

Ms Ros Hall, Regional Clinical Coordinator for SICSAG, NHS National Services Scotland.

Dr Martin Hughes, Consultant in Anaesthesia and Intensive Care Medicine, NHS Greater Glasgow & Clyde

Dr Nazir Lone, Consultant in Intensive Care Medicine, NHS Lothian

Ms Clare McGeoch, Quality Assurance Manager for SICSAG, NHS National Services Scotland.

Ian Mellor, Consultant in Anaesthesia and Intensive Care Medicine, NHS Tayside

Dr Graham Nimmo, Consultant Physician in Intensive Care Medicine and Clinical Education, NHS Lothian President SICS

Dr Peter O'Brien, Consultant in Anaesthesia and Intensive Care Medicine, NHS Ayrshire and Arran

Dr Sarah Ramsay, Consultant in Anaesthesia and Intensive Care Medicine, NHS Greater Glasgow & Clyde

Dr Chris Richard, Consultant in Anaesthesia and Intensive Care Medicine, NHS Borders

Dr Jim Ruddy, Consultant in Anaesthesia and Intensive Care Medicine, NHS Lanarkshire

Mr Paul Smith, National Clinical Coordinator for SICSAG, NHS National Services Scotland.

Dr Robyn Smith, Operational and Strategic Lead Clinician, Cardiothoracic Anaesthesia and Critical Care, Golden Jubilee National Hospital

Dr Neil Stewart, Consultant in Anaesthesia and Intensive Care Medicine, NHS Forth Valley

Dr Steve Stott, Consultant Anaesthetics and Intensive Care, NHS Grampian

Mr Alan Timmins, Critical Care Pharmacist, NHS Fife

Dr Charles Wallis, Vice- Chairman SICSAG Consultant in Anaesthesia and Intensive Care Medicine, NHS Lothian





[www.sicsag.scot.nhs.uk](http://www.sicsag.scot.nhs.uk)

[www.scottishintensivecare.org.uk](http://www.scottishintensivecare.org.uk)