

Improving quality in intensive care unit practice through clinical audit

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The Faculty of Intensive Care Medicine (FICM) and the Intensive Care Society (ICS) aim to set the highest standards of care for all critically ill patients. Documents such as the Core Standards in Intensive Care¹ and the upcoming Guidelines for the Provision of Intensive Care Services or GPICS both help define intensive care within the UK and provide a cohesive message to clinicians and managers on what intensive care constitutes.

Delivery of the best possible patient care is the goal of modern healthcare and is central to every quality improvement project. However, achieving high-quality care in the intensive care unit (ICU) poses significant challenges:

- Enormous costs (staffing, medication, equipment)
- Complex conditions and processes
- Time pressure
- High number of activities
- Increasing demand for intensive care services.

Intensive Care Medicine has started moving away from pure mortality figures to using quality indicators as a measure of performance. This approach is not just being adopted here in the UK but also across Europe. Both the European Society of Intensive Care Medicine² and the Adult Critical Care Clinical Reference Group have published a list of standards they consider to be indicative of good-quality practice (Table 1).

Clinical audit plays a vital role in clinical governance and also forms the stepping-stone for quality improvement projects at the heart of which is patient care. The National Institute for Health and Care Excellence defines clinical audit³ as:

A quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change. Aspects of the structure, process and outcomes of care are selected and systematically evaluated against explicit criteria. Where indicated changes are implemented at an individual, team or service level and further monitoring is used to confirm improvement in healthcare delivery.

The importance of audit as the initial step of a quality improvement programme is only just being recognised at a national level. Traditionally, audit focused mainly on measuring performance against set standards before making a change in practice and repeating the whole process or closing the loop. Indeed, such a definition was frequently regurgitated by doctors and other allied health care professionals at interview panels up and down the country. The modern approach to clinical audit places more emphasis on implementing changes and sustaining improvements.⁴ It is a more sequential, dynamic process with cycles that measure clinical practice with evidence-based benchmarks of best practice, devise strategies for improvement and measure the impact of the changes.

The National ICM Audit Recipe Book project

The Royal College of Anaesthetists' Audit Recipe Book (ARB) lists 16 audits in their Intensive Care Medicine chapter.⁵ With the establishment of the FICM and standalone run-through ICM training in the UK, the National ICM ARB project is a joint endeavour of the FICM and the ICS.

Initially designed as a means to help clinicians manoeuvre through the process of revalidation, the ARB now aims to support other national documents in improving patient care on the ICU. The ICS and FICM are aware that many ICUs throughout the country already have high-quality, robust audit programmes. Hence, one of the early steps in the development of the ARB was to invite colleagues across the country to submit proposals for audit projects to be included in the ARB. Being a dynamic document, as

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Table 1. Quality indicators in critical care.

ESICM quality indicators
1. ICU fulfils national requirements to provide intensive care
2. 24 h availability of a consultant level Intensivist
3. Presence of adverse incident reporting system
4. Presence of routine multi-disciplinary clinical ward rounds
5. Standardised handover procedure for discharging patients
6. Reporting and analysis of standardised mortality ratio
7. Intensive care readmission rate within 48 h of ICU discharge
8. The rate of unplanned endotracheal extubations
9. Rate of CVC-related blood stream infection
Adult critical care clinical reference group dash board quality indicators
1. Percentage of total available critical care bed days utilised for patients more than 24 h after the decision to discharge.
2. Percentage of patients discharged from critical care between 7:00 and 21:59 h.
3. Percentage of discharges readmitted to critical care within 48 h of discharge.
4. Percentage of critical care (L3) unit admissions from another equivalent unit for non-clinical reasons (assigned to discharging unit).
5. Rate of unit acquired infection in blood.
6. Standardised mortality ratio (using ICNARC risk adjustment model) for critical care patients.
7. Standardised mortality ratio (using ICNARC risk adjustment model) for critical care patients with an expected mortality less than 5%.
8. Standardised mortality ratio (using ICNARC risk adjustment model) for critical care patients with an expected mortality between 5% and 10%.
9. Standardised mortality ratio (using ICNARC risk adjustment model) for critical care patients with an expected mortality between 10% and 15%.
10. Proportion of elective surgical critical care bed bookings cancelled due to lack of availability of a post-operative critical care bed.

our knowledge and understanding evolve, so will the various audits.

The audits included would focus on subjects with an underlying, well-defined evidence base. This approach should result in effective changes in care that have been demonstrated beyond doubt to result in improved outcomes for patients. The potential list of audits that can be conducted in ICU is vast, but ICUs' audit programmes should always include a mandatory core group of topics. The ARB's suggested audits will also help guide the clinical audit activity of members as part of the revalidation process.

Members of the ICS were surveyed by email, and the online submissions were analysed and categorised into several broad themes.⁶ The top five audit submissions were:

1. ARDSnet ventilation compliance
2. Intubation practice and capnography
3. Tracheostomy care
4. Central venous catheter (CVS) bundle compliance^a
5. Renal replacement therapy practice^a

The concept is that individual bundles will be developed for each audit project. These bundles will contain the background, suggested methodology, references and data collection proforma as

well as an excel spreadsheet for data entry which will have all the formulae programmed for analysis and a standardised summary. Each individual audit bundle would have been piloted at a regional level, the results of which would also be included with the bundle. This approach will demonstrate that the audit is feasible in real-world conditions and, perhaps more importantly, will highlight lessons that were learnt during the conduct of the regional pilot.

A standardised methodology would also allow ICUs to benchmark their own results against explicit national standards. Equally, it would allow for comparison of unit performance within a region or indeed nationally. Engagement with the whole audit process could be used by the Care and Quality Commission as a means of assessing the unit's or trust's performance during their evaluation.

Another advantage of a standardised methodology is that it allows for collaboration between ICUs at a regional and national level. Numerous trainee-led regional collaboration groups have been set up across the country in a variety of medical specialities.⁷ The ARB is thus an opportunity to encourage multi-disciplinary audit activity, which is reflective of how critical care is practised in the UK. By pooling our experience and data, it would lead to greater patient numbers and thus more meaningful results to improve quality of care and patient safety.

^aAlso included in RCoA ARB 3rd edition.

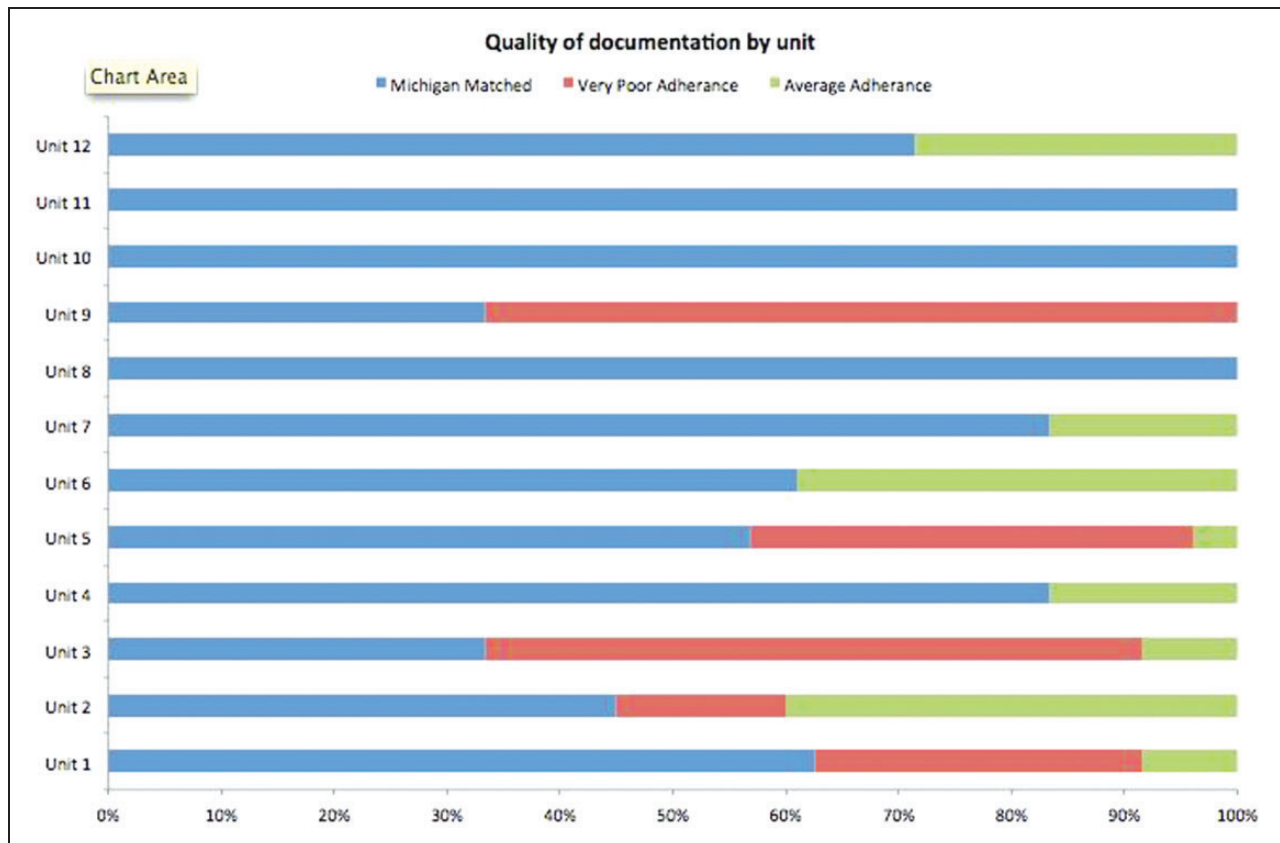


Figure 1. Individual unit's compliance.

CVC pilot

The first ARB audit bundle that has been developed is the CVS insertion bundle. Bloodstream infections associated with the insertion and subsequent care of CVCs are a significant cause of morbidity/mortality. Matching Michigan⁹ is arguably the most prominent quality improvement programme in ICUs linking technical and non-technical interventions (e.g. leadership, teamwork and culture change), which have been shown to reduce CVC bloodstream infections (CVCBSIs). This quality improvement programme introduced by the National Patient Safety Agency in 2009 has had high levels of participation across English ICUs.⁹

A prospective audit of documentation for all new central lines in the ICU for seven days across the Wessex region was conducted against national guidelines by our regional trainee collaborative group (SPARC-ICM).¹⁰ Data were collected regardless of where the line was initially inserted (e.g. Emergency Medicine Departments, Theatres or other hospital sites).

Practice in 12 ICUs (including cardiac, neuro and paediatric ICU) across nine hospitals in the Wessex Region was audited. A total of 188 lines were audited and only 61.8% of them were fully compliant with all

aspects of care (Figure 1). A significant proportion of CVCs was inserted outside the ICU. Lines inserted outside the ICU had lower compliance rates compared to those inserted in the ICU. The results of the audit were presented at regional level which led to several issues being highlighted. Changes implemented post audit include the standardisation of CVC insertion packs across the region. Perhaps more importantly, it highlighted the fact that not all ICUs measured their CVCBSI rates. CVC insertion bundles need to be complemented with a management bundle and active surveillance of infection rates. Compliance with the insertion bundle is only a surrogate marker for CVCBSI rates; active surveillance would allow early intervention and assessment of interventions targeted at reducing CVCBSI.

Conclusion

It is anticipated that commissioning bodies as well as governing agencies, e.g. Care Quality Commission, will incorporate the content of national documents such as the Core Standards for Intensive Care Services and the Guidelines for the Provision of Intensive Care Services into their assessment tools when reviewing the performance of ICUs. A list of mandatory audits may be included in these

documents. The ARB is a tool to help clinicians and ICUs to improve patient care. Individual ICU's participation in the various audit projects listed in the ARB could be used to assess whether the ICU is safe, effective, caring, responsive and well-led.

Furthermore, the standardised methodology will permit collaboration between individual ICUs and regions. The available data have the potential to make a significant impact on our ability to deliver improvements in productivity and quality of service. Indeed, the first UK national ICM audit project would become a distinct reality. Lessons can be learnt and mistakes can be shared which would lead to swift improvement in patient care.

Equally, it would allow for benchmarking between individual unit's performance, acting as an impetus to disseminate best practices. Benchmarking is more than just comparing performance with the national average. Units should be encouraged to aspire to excellence- learning from the top performing units, transferring and adapting this information to their own unique conditions.

Whilst the process of auditing practice will itself bring about change, it is the culture instilled within the ICU and all professionals within it that will ultimately improve patient experience.

Conflict of interest

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