INTENSIVE CARE UNITS: OPEN OR CLOSED?

M MER

MBBCh Dip PEC(SA) FCP(SA)
Pulmonology subspecialty Cert Critical Care(SA) MMed (Int Med) FRCP(London)
FCCP(USA) PhD
Principal Specialist, Department of Medicine, Divisions of Pulmonology
and Critical Care, Charlotte Maxeke Johannesburg Academic Hospital
and University of the Witwatersrand

Critical Care is a relatively new, exciting and dynamic specialty with continuous new developments and advances. Surgery is a specialty that has evolved over hundreds of years. Intensive Care Units (ICUs) are now well recognised to play an important role in contributing to the favourable outcome of patients from a variety of disciplines, including surgery.

These units are currently integral to modern day medical practice and it is becoming increasingly acknowledged and appreciated that the most efficient, high quality and cost-effective is best achieved when responsibility and management is led by those who have special expertise in such a domain.

The acute life-threatening challenges frequently encountered in Critical Care, often relate to complex deteriorations and complications which may converge and amplify each other, such as severe sepsis, acute renal failure, haemodynamic instability & shock, respiratory difficulty, neurological issues and many others.

Competent Critical Care of many of these complex problems requires expertise which often goes far beyond the knowledge and skills of one general specialty. Critical Care practitioners are trained and equipped to deal with, and manage such entities.¹ This service is provided on-site, around the clock and is present in most larger hospitals.

Critical Care medicine is highly pro-active acute medicine. Today there is good evidence that acute and timely effective reaction is mandatory for optimal outcomes.
EVIDENCE

Critical Care medicine has been shown to be more efficient when experts especially competent in critical care (“intensivists”) are involved in management\textsuperscript{2-8}.

In older established data, the effect of daily rounds by ICU practitioners on clinical and economic outcomes after oesophageal resection in 35 acute care hospitals in the United States of America was evaluated. Over a five year period, 366 adult patients underwent oesophageal resection.

After adjusting for patient case-mix, the lack of daily rounds by an ICU practitioner was independently associated with a 73\% increase in hospital length of stay and a 61\% increase in total hospital cost. Furthermore, postoperative complications occurred more frequently. In this setting, the participation of an ICU practitioner was shown to improve the quality of care and reduce costs\textsuperscript{9}.

A meta-analysis addressing the association between ICU practitioner staffing and patient outcomes, and incorporating 26 relevant studies, found that high-intensity ICU staffing, i.e. mandatory intensivist consultation or closed ICU (all care directed by intensivist), was associated with a lower mortality (in 16 from 17 studies, risk adjusted), lower ICU mortality (in 14 from 15 studies, risk adjusted), shorter hospital length of stay (LOS) (in 10 from 13 studies) and ICU LOS (in 14 from 18 studies), as compared to low-intensity ICU staffing (ie. no intensivist consultation)\textsuperscript{10}.

More recently, an updated systematic review and meta-analysis evaluating 52 studies that met strict inclusion criteria was reported\textsuperscript{11}.

High-intensity staffing (ie. transfer of care to an intensivist-led team or mandatory consultation of an intensivist) compared to low intensity-staffing, was associated with lower hospital mortality (risk ratio 0.83; 95\%CI 0.70-0.99) and ICU mortality (pooled risk ratio 0.81; 95\%CI 0.68-0.96). Significant reductions in hospital and ICU LOS were also seen.

The benefit of high-intensity staffing was most pronounced in surgical and combined medical-surgical ICUs.
This most relevant, recent and comprehensive systematic review and meta-analysis, concluded that closed ICUs and intensivist-led teams were associated with reduced ICU and hospital mortality, and that benefits were dependent on type of ICU, with surgically orientated units deriving most benefit.

A retrospective study specifically addressing the impact of closed versus open ICUs (where there was still ICU consultation available), and involving 2602 patients revealed significant reductions in mortality for patients admitted to a closed versus an open unit.\(^{12}\)

Several further papers have demonstrated the benefit of closed ICU services.\(^ {13,14}\)

**TIMELY ACTION BY THE ICU TEAM**

Unstable critically ill patients may deteriorate very quickly, requiring constant surveillance and continuous titration of therapy. Good Critical Care is continuously capable of acting. This concept cannot be realised by regular rounds when medical personnel see their patients only intermittently. Communication problems may be crucial in such situations. Critical Care must be provided by practitioners who thoroughly know and have been trained to deal with the actual problems of their patients - that means by practitioners who are present in the ICU, continuously dedicated to Critical Care, and not responsible for any other service in the hospital.\(^ {15}\)

A consensus report from two task forces concluded that there are good arguments for full-time, on-site specialists in the ICU, with optimal care being fulfilled in a closed team, and suggested that the best ICU model is the “closed unit.”\(^ {14,15}\)

The closed unit concept is now widely accepted as a multidisciplinary approach with specialised practitioners (intensivists), specialised nurses, and other experts working together in a team under the supervision of full-time directors.\(^ {15}\)

**MULTIDISCIPLINARY CO-OPERATION**

The concept of team care not only relies on the expertise of the ICU team, but importantly includes appropriate communication, interaction, co-operation and mutual trust & respect between the ICU team and the primary responsible practitioners.
For excellent ICU care to be delivered it is imperative to have this concept underpinning the entire process. In this fashion, care can be most optimised and provide better outcomes, with improved resource consumption, reduction of potential complications, and shorter durations of ICU and hospital stay.

SUMMARY

- Critical Care Medicine is a dynamic new specialty in which practitioners have a broad array of expertise to deal with many complex problems across a variety of disciplines, including surgery.
- Intensive Care Units are integral to the delivery of improved care in modern day medical practice.
- Excellent evidence exists to suggest that intensivists and closed ICUs improve patient outcomes
- Co-operation, trust and mutual respect between the ICU team and the primary responsible practitioners is essential, and facilitates the most optimal outcomes

REFERENCES


