

## What's new in critical care?

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### Introduction

*"The more things change, the more they remain the same."*

- Jean-Baptiste Alphonse Karr (1908-1990)

Critical care medicine remains a fast developing field. The advent of novel pharmacological agents, development of new monitoring and therapeutic technologies, and a better understanding of physiology and pathology, allow us to appropriately manage an expanding population needing aggressive resuscitation, challenging organ support and sympathetic terminal care. Yet, such advances only serve to make us come full circle and refocus on the basic steps of effective health care.

So, what's new and at the cutting edge in intensive and critical care? On what are critical care practitioners focusing? Medscape looked at the top 10 articles that critical care practitioners read in 2010. Not surprisingly, readers were keenly interested in clinical news that could potentially affect the day-to-day care of their patients. Below are the highlights.

### New brain death guidelines

Updated for the first time in 15 years, the new American Academy of Neurology guidelines provide step-by-step instructions to determine brain death in adults. Not much has changed. The authors reported that new data have confirmed the effectiveness of earlier recommendations. The need for only one physician assessment, instead of two, was noted.

### Dopamine or norepinephrine for shock?

The age-old question of which drug is better to treat shock continues to stimulate study and debate. De Backer et al attempted to show the superiority of either dopamine or norepinephrine in treating different types of shock. The investigators concluded that although no significant differences in mortality were evident, norepinephrine

should be the drug of first choice because dopamine was associated with more adverse events.

### Controversies in the treatment of sepsis

The controversial roles of intensive insulin therapy, corticosteroids, and activated protein C (APC) in the treatment of sepsis were discussed. In reviewing the current clinical trials, a more liberal targeted blood glucose range (140-180 mg/dL) was suggested. There is a lack of mortality benefit and increased hypoglycaemic episodes with intensive glucose control (80-110 mg/dL). Low-dose corticosteroids (hydrocortisone) appear to be beneficial in severe sepsis refractory to intravenous fluid and vasopressor support. APC is perhaps best reserved for individuals with severe sepsis at high risk of death (APACHE) > 25.

### Tigecycline linked to increased mortality risk

Tigecycline is a glycylicycline antibiotic with a broad spectrum of activity. Recent data suggest increased mortality risk in patients treated for hospital-acquired pneumonia and particularly ventilator-associated pneumonia, as well as diabetic foot. The drug is not approved for these indications. It is only registered for intra-abdominal and skin and soft tissue infections, and community-acquired pneumonia. The issue highlights the often practised, and highly criticised off-label use of drugs.

### FDA again warns against intravenous administration of nimodipine

Nimodipine is a dihydropyridine calcium-channel blocker originally developed for the treatment of high blood pressure. It is not frequently used for this indication, but has shown good results in preventing vasospasm, a major complication of subarachnoid haemorrhage. The Food and Drug Administration (FDA) again reminded clinicians that nimodipine should be given only by mouth or through a

feeding tube, and never by intravenous (IV) administration, a method that could be fatal. IV administration of nimodipine can cause cardiac arrest, dramatic drops in blood pressure, and other cardiovascular adverse events. Despite a black box warning, there have been 25 cases of IV administration errors.

### High vs. low positive-end expiratory pressure in the ventilatory management of adult patients

There is still debate about the optimal positive end-expiratory pressure (PEEP) setting in patients with acute lung injury (ALI) and acute respiratory distress syndrome (ARDS). A systematic review of existing research. They showed that for ALI there was no difference between low and high PEEP. However, for ARDS, high PEEP was better. Overall, there was no difference in complications in the two groups.

### Management of bleeding following major trauma: an updated European guideline

This evidence-based approach to managing bleeding in trauma patients conforms with the Grading of Recommendations Assessment, Development and Evaluation (GRADE). This is an update of the guidelines published in 2007 by the task force for Advanced Bleeding Care in Trauma. There are new recommendations on coagulation support and monitoring, and the appropriate use of local haemostatic measures, tourniquets, calcium and desmopressin in the bleeding trauma patient. The remaining recommendations have been reevaluated and graded based on recent literature. The need for an evidence-based multidisciplinary approach is emphasised.

### Procalcitonin-guided antibiotic therapy

Biomarkers are increasingly being used to diagnose and monitor sepsis treatment. Procalcitonin has shown much promise in this regard. A multi-centre randomised controlled trial was performed to evaluate the use of Procalcitonin to Reduce Patients' Exposure to Antibiotics in Intensive Care Units (PRORATA) and concluded that procalcitonin guided antibiotic therapy reduces antibiotic use in critically ill, non-surgical patients with no apparent adverse outcomes.

### Analysis of dexmedetomidine cost compared with midazolam for long-term sedation

Sedation in the intensive care unit (ICU) has undergone change in recent years to return to the situation in which patients were awake or arousable. Dexmedetomidine is an alpha-2-adrenergic receptor agonist that provides sedation without causing respiratory depression. When the situation

is assessed beyond drug acquisition costs, sedation with dexmedetomidine significantly reduces ICU care costs (\$9 679 in cost savings) compared to sedation with midazolam. This reduction was primarily due to decreased ICU stay costs and reduced mechanical ventilation costs.

### Health care reform

The American healthcare system is undergoing major reform amidst much debate. There are varying opinions on how to improve the system, the legal framework that needs to underpin this reform, the sourcing of funding to make such changes possible, and the roles and responsibilities of patients, doctors, the insurance industry and government. However, there is no doubt that an overhaul is needed, so that more patients receive health cover, while ensuring quality of care, preserving the doctor-patient relationship, and keeping costs from escalating. Is South Africa any different with regard to the proposed introduction of a National Health Insurance?

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