

CAMPAIN Update

A global effort to improve care for patients with severe sepsis and septic shock

July/August 2008



Campaign Update is the official newsletter of the Surviving Sepsis Campaign. The Surviving Sepsis Campaign is a partnership of the European Society of Intensive Care Medicine, the International Sepsis Forum, and the Society of Critical Care Medicine. This bi-monthly communiqué focuses on topics related to local, regional, and national SSC activities. Feedback and content suggestions may be sent to campaignupdate@survivingsepsis.org.



Campaign strives to achieve central endorsement in UK

By Dr. Ron Daniels
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Like many critical care clinicians, I have been frustrated over the last 4 years by barriers to implementation of the resuscitation bundle across my hospitals – be the barriers academic, related to human or material resources, or from lack of awareness among those colleagues outside critical care and emergency medicine. As such, compliance in the United Kingdom (among organizations supplying data) was in line with international figures – just 11% at 3 years following the launch of the Campaign, compared with over 35% for the management bundle.

In the United Kingdom, patients tend to present to emergency departments relatively early in the course of their illness; therefore whole-hospital solutions are required to deliver the bundle reliably. Over the last 12 months, we have adopted

a twin-strategy approach to overcoming these difficulties. We believe that this approach is beginning to pay dividends, and foresee formal national endorsement within coming months.

At inception, the Campaign was broadly supported by our Department of Health, and led by Dr Jane Eddleston, the then newly-appointed Department of Health Adviser for Critical Care. Additional support was received from the United Kingdom Intensive Care Society and Royal College of Nursing, along with the European Society of Intensive Care Medicine. However, at no point was the delivery of the Campaign's recommendations centrally mandated, and only the ESICM produced a formal statement of support.

The renewed approach has focused on education and reliability.

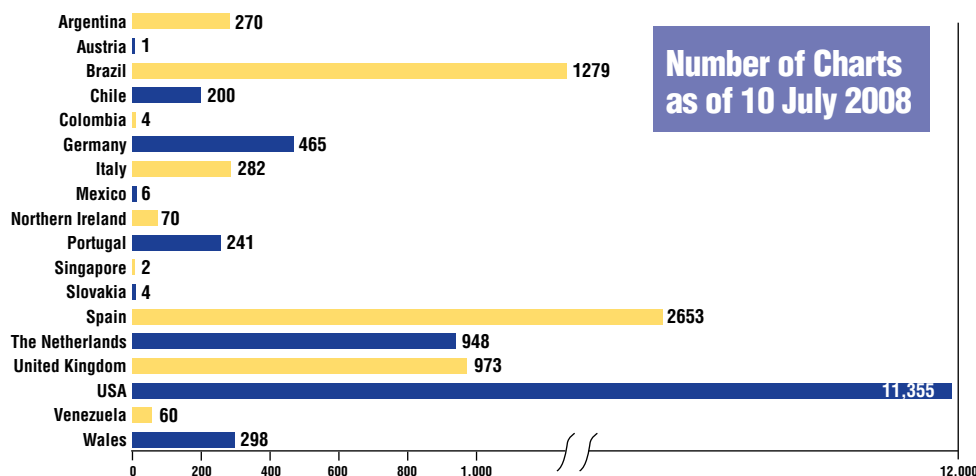
Education

Engaging professional bodies beyond critical care in formal endorsement of the Campaign had proven to be a challenge. Our Royal Colleges in the UK are charged more with ensuring standards of training and competence than with the application of clinical guidelines and mandates.

Mindful of this, we set about the production of a uniform, multi-disciplinary, multi-professional

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Guidelines are Good for Pediatric Patients, Too

By Margaret M. Parker, MD, FCCM



In the last issue of *Campaign Update's* "Leadership Perspective," Dr. Townsend discussed the value of guidelines relative to the tools that are available to improve the quality of care we provide to our sepsis patients. While we work in systems that have increasing degrees of standardization,

we face even greater challenges with our pediatric patients due to the limited amount of evidence-based data. While the research is conducted, we can continue to apply the information we do have about successes in treating severe sepsis in children. As he stated, "if we can't achieve 100%, surely we can embrace incremental changes."¹ and consistently apply what we know about the unique aspects of sepsis in children.

Sepsis is a major cause of mortality in children, but there is a much lower mortality rate from sepsis in children (10%) than in adults (30-50%), at least in the developed countries. Because sepsis is common and deadly in children, pediatric recommendations are included in the Surviving Sepsis Campaign Guidelines. Many of the recommendations are similar to those for adults, but there is a paucity of literature supporting them.

The most important steps in the management of the child with severe sepsis or septic shock are aggressive fluid resuscitation and early appropriate antibiotic therapy. These interventions are the most likely to bring significant reductions of mortality, especially in developing countries where resources are very limited. Initiating a process to ensure the implementation of these two interventions, and measuring what you do to ensure that all children receive early fluids and antibiotics, are the most important steps you can take to lower the mortality from sepsis in the children for whom you care.

An emerging body of literature supports the pediatric guidelines for management of severe sepsis and septic shock. A study by Albuali et al looked at their practice with regard to mechanical ventilation over past and recent time periods, and reported that lower tidal volume ventilation was associated with improved outcomes.² More recently, de Oliveira and colleagues compared treatment of children

with sepsis according to the ACCM/PALS guidelines, with or without goal-directed therapy using ScvO₂.³ One hundred two patients were studied. The mortality was lower in the ScvO₂ goal-directed therapy group (11.8% vs 39.2%, $P=0.002$) and there were fewer new organ failures.

Steroid use in children with septic shock remains highly controversial. The guidelines suggest that steroids should be reserved for children with catecholamine resistance and suspected or proven adrenal insufficiency. Activated Protein C should not be used in the management of children with severe sepsis or septic shock. Glycemic control is another highly controversial area. It is recognized that hyperglycemia is associated with worse outcomes, as it is in adults, but children (particularly infants) are at greater risk of hypoglycemia. No graded recommendations exist regarding glucose control in children.

Despite the lower mortality rate from sepsis in children, there is still room for improvement. Standardizing care and measuring what you do to ensure that all children get the same standard of care (that is, ensuring that you are really doing what you think you are doing) are important steps to improving your care and outcomes for your youngest patients. While data from implementation of the guidelines have not routinely been collected in the Surviving Sepsis database for pediatric patients, measuring what you do in your own institution is critical to improving your own care processes, and ultimately, outcomes.

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1. Townsend SR. Guidelines are good—and make us better. *Campaign Update* 2008; May-June
2. Albuali WH, Singh RN, Fraser DD, et al. Have changes in ventilation practice improved outcome in children with acute lung injury? *Pediatr Crit Care Med* 2007;8:324-330
3. DeOliveira CF, deOliveira DSF, Gottschald AFC, et al. ACCM/PALS haemodynamic support guidelines for paediatric septic shock: an outcomes comparison with and without monitoring central venous oxygen saturation. *Intensive Care Med* 2008; 34:1046-1075.

SurvivingSepsis.org offers many resources

Corrected guidelines posted

The official website of the Surviving Sepsis Campaign, www.survivingsepsis.org, offers myriad resources to new and veteran participants. The background and history of the Campaign along with interviews with Campaign leaders and participants as well as slide sets that can be used for in-service programs appear on the site. In addition, each issue of *Campaign Update* is posted. A glossary of terms, links to other sources of information, and explanations of sepsis and its treatment for families and friends of sepsis patients are readily available on the site.

The manual *Implementing the Surviving Sepsis*

Campaign is reproduced on the site, as are forms, checklists, and charts that can be used in conjunction with the sepsis bundles. PDFs of a poster and pocket guides derived from the 2008 edition of the International Guidelines for Management of Severe Sepsis and Septic Shock can be downloaded from the website to supplement what is in the manual. A pdf of the corrected version of the 2008 guidelines that incorporates the guidelines as published in *Critical Care Medicine* and *Intensive Care Medicine* in January 2008 along with the errata published in April 2008 into one continuous, corrected version now appears on the site for ease in obtaining the complete version for in-hospital use.

To suggest additions to the site or request further information, contact info@survivingsepsis.org

Articles below may provide additional background for SSC implementation.

Marik PE, Pastores SM, Annane D, et al. **Recommendations for the diagnosis and management of corticosteroid insufficiency in critically ill adult patients: consensus statements from an international task force by the American College of Critical Care Medicine.** *Crit Care Med.* 2008; 36(6):1937-49.

A multi-disciplinary, multi-specialty task force of experts in critical care medicine and international experts in endocrinology reviewed published literature and developed consensus statements using a modified Delphi methodology for the diagnosis and management of corticosteroid insufficiency in critically ill adult patients. Their results can be summarized as:

- 1) Critical illness-related corticosteroid insufficiency should be suspected in hypotensive patients who have responded poorly to fluids and vasopressor agents, particularly in the setting of sepsis.
- 2) Adrenal insufficiency in critically ill patients is best made by a delta total serum cortisol of <9 µ/dL after adrenocorticotropic hormone (250 µg) administration or a random total cortisol of < 10 µ/dL.
- 3) There is a potential benefit of treatment with glucocorticoids in patients with vasopressor-dependent septic shock, and patients with early severe acute respiratory distress syndrome (PaO₂/FiO₂ of < 200 and within 14 days of onset). [Note: An accompanying editorial by R. Phillip Dellinger expresses the opinion that there are not enough data to recommend use of steroids in early severe ARDS.]
- 4) The adrenocorticotropic hormone stimulation test should not be used to identify those patients with septic shock or acute respiratory distress syndrome who should receive glucocorticoids.
- 5) Hydrocortisone in a dose of 200 mg/day in four divided doses or as a continuous infusion in a dose of 240

mg/day (10 mg/hr) for ≥ 7 days is recommended for septic shock.
 6) Glucocorticoids should be weaned and not stopped abruptly.
 7) Reinstitution of treatment should be considered with recurrence of signs of sepsis, hypotension, or worsening oxygenation.

Ali NA, O'Brien JM Jr, Dungan K, et al. **Glucose variability and mortality in patients with sepsis.** *Crit Care Med.* 2008 Jul 1. [Epub ahead of print].

Although data from early studies have been shown to improve outcome in critically ill patients, newer multi-centered studies targeting normoglycemia with the use of continuous insulin infusions have yielded conflicting results. Glucose variability, manifested as the standard deviation rather than the glucose level, has been shown to be an important factor associated with in-hospital mortality in a mixed population of critically ill patients. In this retrospective study, 1,246 adult patients with sepsis were included to determine the association between glucose variability and hospital mortality. Their results confirmed glucose variability as an independent risk factor for hospital mortality, suggesting glucose variability as a target in glucose management in patients with sepsis.

Database Continues to Grow as Analysis Takes Place

At this writing, nearly 19,000 patient charts have been contributed to the Surviving Sepsis Campaign database. While the database was frozen at a point in time earlier this year to allow for the initial analysis of Campaign progress from more than 15,000 charts, the Campaign's efforts continue in full swing.

Participants are able to have their data analyzed in comparison to the aggregate database as well as to chart their internal improvement. As the Campaign moves into its next phase after 2008, the Society of Critical Care Medicine will continue to maintain the global database and determine how support to participants will be handled in the future. Further information will be available in upcoming issues of *Campaign Update*.

CALENDAR

2008

July 19

Venezuelan Critical Care Sepsis Workshop
Caracas, Venezuela

September 21-24

ESICM Annual Meeting

Monday, September 22

SSC Update

8:30-9:30

Lisbon Room

Wednesday, September 24

Controversies in Sepsis

(sponsored by International Sepsis Forum)

12:10-14:00

Room tbd

Wednesday, September 24

SSC Data Preview

tbd

Lisbon, Portugal

November 19-21

International Sepsis Forum:

Sepsis 2008

Granada, Spain

2009

January 31-February 4

SCCM 38th Critical Care Congress

Nashville, Tennessee, USA

Send us your SSC meeting information and we will include it in future issues of *Campaign Update*. Send submissions to campaignupdate@survivingsepsis.org.

Campaign strives to achieve central endorsement in UK *(continued from page 1)*

package of education designed to promote early recognition and immediate therapy of severe sepsis among all practitioners, and to facilitate early liaison with critical care to ensure the delivery of early goal-directed therapy (EGDT) when appropriate.

Survive Sepsis was launched in September 2007 following consultation with the Surviving Sepsis Campaign's executive committee as to content, style, and format. The program comprises a day's training to a mixed audience of doctors, nurses, allied health professionals, and technicians together with a toolkit consisting of the Severe Sepsis Screening Tool and a care pathway delineating those tasks expected of all staff and those (namely EGDT) requiring liaison with critical care.

During the latter half of 2007, Survive Sepsis was accredited for Continuous Professional Development by the Royal Colleges of Physicians, Anaesthetists and Nursing in the United Kingdom. The Care Pathway – and therefore the Campaign's resuscitation bundle as a whole – was ratified and approved by the Intensive Care Society, Society of Acute Medicine, College of Emergency Medicine, British Association of Critical Care Nurses, and the National Outreach Forum.

These endorsements, through a pragmatic and achievable approach to implementation, have helped to lend the UK Campaign a level of credibility among a wide range of disciplines and transcended much of the academic debate which has hitherto hindered widespread acceptance. This has assisted in turn with the second step of the approach.

Reliability

The reliable delivery of healthcare in a diverse system is a challenge to all. In the UK, the driving force in healthcare has seen a shift in the last 5 to 10 years from one of efficiency and cost-effectiveness to one of reliability and safety. The UK Steering Group has attempted to harness this change in culture to promote national mandates in the delivery of care according to our international recommendations.

Despite consensus opinion and evidence base, the absence of direct data supporting the application of the care bundles has been a hindrance. The first step in obtaining formal central endorsement must therefore be a demonstration that compliance can be improved upon across an acute care hospital over time, and that compliance is associated with outcome benefits.

At Survive Sepsis' base hospital, supported by a grant from the National Institute of Healthcare Research, we have been evaluating this process. While the study is ongoing, interim analysis has demonstrated that, over 6 months, the introduction of the education program, appointment of 2 dedicated sepsis nurse practitioners, and use of small-step changes has been associated with

nearly 50% relative improvement in compliance (to 60%), with that compliance being associated with a 32% relative risk reduction for mortality (n=335).

Within the last 2 months, we have presented the Campaign, supported by these data, to the NHS Institute for Innovation and Improvement, and to the NHS Litigation Authority (NHSLA). The former body promotes care bundles and examples of good practice to key organizations within the NHS, and in turn promotes these organizations as flagship institutions. The latter sets risk management standards for all acute care hospitals in the NHS to achieve. Compliance with these standards affords substantial reductions in clinical negligence indemnity contributions.

The NHS institute has adopted the resuscitation bundle as a recommendation in the revised Leading Improvement in Patient Safety (LIPS) Programme, such that Trusts signing up to the program will receive toolkits and guidance on implementation. This, a first formal NHS endorsement for the Campaign, is perhaps best compared to the IHI's backing in the United States. As a result of this, a related NHS organization, the National Patient Safety Agency, has just committed to the inclusion of SSC recommendations in its next Safer Patient Campaign.

The NHSLA is currently revising its risk management standards, and will be considering the recommendations of the Surviving Sepsis Campaign accordingly. Although not yet accepted, this consideration is at least indicative of the fact that the time is coming when severe sepsis will be afforded similar attention to that given to patients with cancers and acute coronary syndromes.

We are a long way from a government mandate to achieve the recommendations of the Surviving Sepsis Campaign, and it may be argued that this would not be a good thing, since a drive to deliver solely the bundles may detract from other important aspects of these patients' care. However, in the last 12 months the UK Steering Group has worked hard to attempt to heighten awareness across a broader spectrum of clinicians and healthcare managers, and intends to continue to promote the Campaign nationally until the point when a commitment to the early identification and immediate treatment of these patients is seen as the standard of care.

Thanks to Survey Participants

Nearly 70% of those Campaign participants who had contributed to the database by March 2008 responded to the methodology survey earlier this year. The Campaign leadership greatly appreciates the extra effort on the part of those who completed the survey. The additional information will allow us to align predictors of outcome with specific actions taken in the participating hospitals as all the information from the database is analyzed.