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**New pediatric sepsis guidelines
recommend child-specific care for deadly condition**
Timely and appropriate treatment saves lives

AT A GLANCE

- Diagnosis and treatment of sepsis in children varies from adults, prompting the development of the first pediatric sepsis management guidelines from the Surviving Sepsis Campaign, a joint initiative of the Society of Critical Care Medicine and the European Society of Intensive Care Medicine.
- Sepsis is a potentially deadly reaction to any infection, from pneumonia to the flu. Sepsis is more deadly than pediatric cancer, killing nearly 7,000 U.S. children every year.
- Symptoms of sepsis can be difficult to gauge in children.
- The guidelines recommend a two-phase protocol for starting antimicrobial therapy in children with signs of sepsis.

MOUNT PROSPECT, Ill – [Feb. 7, 2020] —Sepsis can occur in any child – including those who are otherwise healthy – and recognizing the signs and acting quickly can save lives, according to the first sepsis guidelines specifically focused on children from the Surviving Sepsis Campaign. Establishing a two-phase process for identifying and managing sepsis in children including starting antibiotic therapy within one hour of evidence of septic shock are among the recommendations in the new guidelines, published in *Pediatric Critical Care Medicine* and *Intensive Care Medicine*.

The Surviving Sepsis Campaign is a joint initiative of the Society of Critical Care Medicine (SCCM) and the European Society of Intensive Care Medicine, which are committed to reducing death and disability from sepsis and septic shock worldwide. The campaign's pediatric guidelines provide comprehensive recommendations for sepsis management in children following the GRADE methodology, which notes the quality of evidence and strength of the recommendation.

Sepsis is the body's extreme and potentially deadly response to any infection, such as pneumonia, an infected wound or the flu. Because diagnosis and treatment of sepsis differs in children compared to adults, the new guidelines were developed to help improve care in children from birth to age 18. While the

condition is more common in adults, 1.2 million children develop sepsis globally every year, including more than 75,000 in the United States. Nearly 7,000 American children die of sepsis annually, making it more deadly than pediatric cancer.

Signs of sepsis and its advanced form, septic shock (extremely low blood pressure and blood flow that can cause organs to shut down), may be difficult to gauge in children. To improve the likelihood of timely and appropriate care, parents should bring their children to a health care professional at the first sign of a severe infection, such as fever with fast, labored or shallow breathing or a change in mental status, such as extreme agitation or lethargy. Other signs of sepsis include severe reduction in appetite, reduced urine output and mottled or cold hands or feet.

“All physicians, nurses and other clinicians who care for children are likely to come across sepsis at some point. It’s important to recognize the early warning signs and become familiar with guideline recommendations, which provide a roadmap for improving outcomes and saving children’s lives,” said Scott Weiss, MD, MSCE, FCCM, an intensivist at Children’s Hospital of Philadelphia, and co-vice chair of the guidelines. “Children are not simply small adults and the signs of sepsis and its treatment differ, so they need to be assessed and managed differently.”

The majority of children who have some symptoms of sepsis do not have the condition, making early and accurate diagnosis of sepsis a challenge. For example, common symptoms such as fast heart rate and fast breathing may indicate a child is afraid or anxious. However, sepsis also can be overlooked in children because low blood pressure (a sign of septic shock) may not occur until very late in the illness. For this reason, the guidelines recommend each institution implement screening and protocols to facilitate timely recognition and treatment for children with sepsis and septic shock. Healthcare providers should also consider other assessments of abnormal blood flow beyond blood pressure in children, including pulse strength, capillary refill, and hand and foot temperature.

Therefore, while adult sepsis guidelines recommend all patients begin antimicrobial therapy within one hour of recognition of the condition, the new pediatric sepsis guidelines recommend a two-phase process for assessing children who are suspected of having sepsis. Those who have symptoms of septic shock should be started on antimicrobial therapy within one hour of shock recognition. Those who do not have symptoms of septic shock should be further evaluated to confirm or exclude a diagnosis of sepsis and, if results are positive, started on therapy within three hours of the initial suspicion for sepsis (or sooner if shock develops during the evaluation).

The guidelines recommend obtaining blood cultures before beginning antimicrobial therapy as long as this does not substantially delay antimicrobial treatment. They recommend starting broad-spectrum antimicrobial therapy to cover all likely pathogens that may be causing the infection and narrowing the therapy once the specific pathogen has been identified. But the guidelines also emphasize that antibiotics should be used only when needed.

Children being treated for sepsis should be reassessed daily and taken off antimicrobial therapy once they no longer have evidence of a bacterial infection or the antibiotic spectrum narrowed based on cultures,” said **Niranjan Kissoon**, MBBS, MCCM, FRCP, FAAP, FACPE, vice president of Medical Affairs, British Columbia Children’s Hospital and Sunny Hill Health Centre for Children, and co-chair of the guidelines. “This helps reduce inappropriate antibiotic use, which has become a global health emergency.”

Other recommendations in the pediatric guidelines:

- Children who are being treated in healthcare systems where intensive care is available (on site or through transport) should be provided up to 40-60 mL/kg bolus fluid in the first hour of treatment, based on cardiac output and discontinued if they exhibit signs of fluid overload. However, healthcare systems where intensive care is not available or accessible may not have the resources to manage fluid overload and therefore should not administer a bolus of fluid (unless the child has extremely low blood pressure) and instead provide maintenance fluid. *
- Epinephrine or other vasoactive medication to treat low blood pressure should be started if the child continues to show signs of shock despite appropriate fluid therapy. The guidelines note that symptoms suggesting warm shock (increased cardiac output and decreased systemic

vascular resistance) are often unreliable in children and may mask sepsis-induced heart dysfunction that requires epinephrine to improve heart function.

SCCM is committed to reducing the mortality and morbidity from sepsis and septic shock worldwide. In collaboration with the European Society of Intensive Care Medicine, SCCM leads the Surviving Sepsis Campaign, which developed the evidence-based *Surviving Sepsis Campaign International Guidelines for the Management of Septic Shock and Sepsis-associated Organ Dysfunction in Children*. The guidelines were developed by 49 international experts from a variety of disciplines representing 12 international organizations, three methodologists and three public members. The guidelines will be presented during SCCM's 49th Critical Care Congress and are available at SurvivingSepsis.org.

THE SOCIETY OF CRITICAL CARE MEDICINE

The Society of Critical Care Medicine (SCCM) is the largest nonprofit medical organization dedicated to promoting excellence and consistency in the practice of critical care. With members in more than 100 countries, SCCM is the only organization that represents all professional components of the critical care team. The SCCM Critical Care Congress brings together intensivists and critical care experts from around the world to share the latest scientific research, develop solutions to common issues and improve the care of critically ill and injured patients. Visit sccm.org for more information. Follow @SCCM or visit us on Facebook.

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* The Spring issue of *Critical Connections* and a previous draft of this press release included potentially misleading information regarding the delivery of bolus fluid in the first hour of treatment. To ensure accuracy and clarity, the statement should read as follows:

Children who are being treated in healthcare systems where intensive care is available (on site or through transport) should be provided up to 40-60 mL/kg bolus fluid in the first hour of treatment, based on cardiac output and discontinued if they exhibit signs of fluid overload. However, healthcare systems where intensive care is not available or accessible may not have the resources to manage fluid overload and therefore should not administer a bolus of fluid (unless the child has extremely low blood pressure) and instead provide maintenance fluid.

In other words, as long as there is ICU capability – where fluid overload can be managed if it occurs – the SSC suggests that children receive bolus fluid in the first hour. The previous version noted that health systems without ICUs should not provide bolus fluid because they may not have the resources to assess and manage fluid overload. This direction is not applicable in settings where community hospitals without ICUs can readily transfer children to larger hospitals that offer that level of care or in settings where advanced hemodynamic and respiratory care can be provided outside of a formal ICU. Simply put, if intensive care is accessible (even if not on site), the SSC suggests the child be provided up to 40-60 mL/kg bolus fluid in the first hour of treatment, based on cardiac output and discontinued if they exhibit signs of fluid overload.