

CriticalConnections

THE COMPLETE NEWS SOURCE FOR CRITICAL CARE PROFESSIONALS

SEPSIS AND CHILDREN

Patient Hypotensive? Febrile? Tachypneic?

Measure Lactate *Bedside*

Fast, easy bedside lactate testing

StatStrip Lactate is a hand-held, true point-of-care system that brings lactate testing directly to the patient's bedside. StatStrip Lactate's single-use, disposable biosensor provides the fastest turnaround time (13 seconds) on the smallest whole blood sample (0.6 μ l) with lab-like accuracy. Lactate results are electronically or wirelessly transmitted to the patient's medical record

SSC Hour-1 Bundle calls for early lactate measurement of tissue hypoperfusion

Surviving Sepsis Campaign (SSC) has introduced the 2018 Hour-1 Sepsis Bundle for early recognition and management of sepsis. The SSC Hour-1 Bundle includes obtaining blood for lactate measurement within the first hour of sepsis recognition and to remeasure lactate if the initial lactate is >2 mmol/L.¹ The campaign suggests guiding resuscitation to normalize lactate in patients with elevated lactate levels as a marker of tissue hypoperfusion.¹

CMS SEP-1 quality metric includes early lactate measurement of tissue hypoperfusion

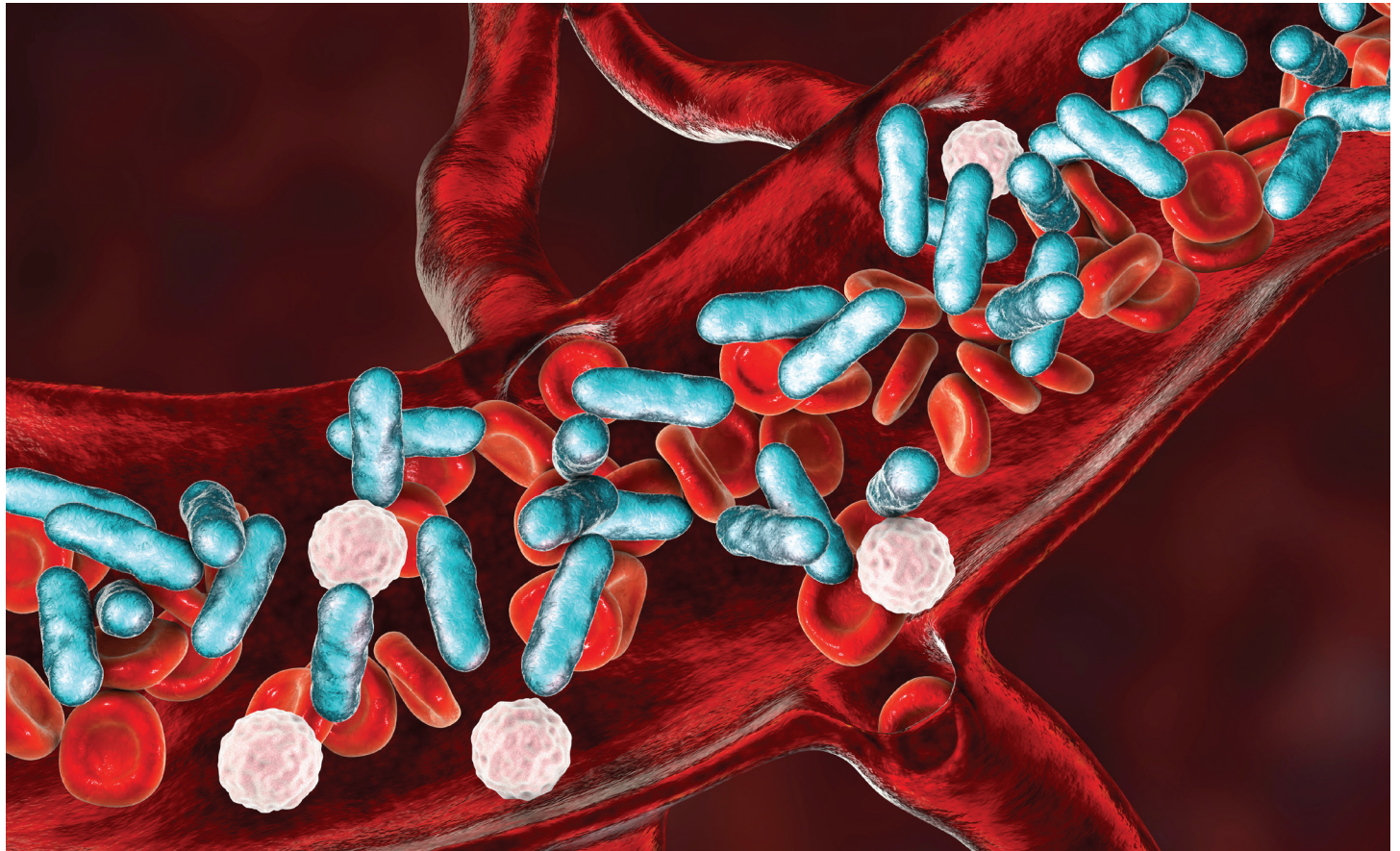
Consistent with the SSC Hour-1 bundle, US Centers for Medicare and Medicaid Services has introduced the Severe Sepsis and Septic Shock: SEP-1 Management Bundle to assess the quality of sepsis care in hospitals. The SEP-1 metric calls for lactate measurement to be completed within 3 hours of sepsis recognition.²



1. Levy M. The Surviving Sepsis Campaign Bundle: 2018 Update. Crit Care Med 2018;46:997-1000.

2. Federal Register /Vol. 79, No. 163/Friday, August 22, 2014/Rules and Regulations. Pages 50236-50241. Accessed online at <https://www.govinfo.gov/content/pkg/FR-2014-08-22/pdf/2014-18545.pdf>





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@LRSorce

WHILE THIS EDITION OF CRITICAL CONNECTIONS FOCUSES ON PEDIATRIC SEPSIS, IT ALSO INCLUDES AN UPDATE ON COVID-19, OUR ICU HERO AT THE 49TH CRITICAL CARE CONGRESS, PEDIATRIC ICU LIBERATION, AND OTHER IMPORTANT TOPICS.

SCCM President Lewis Kaplan, MD, FCCM, discusses "tapping a KEG" in his column. This column is one-stop shopping for information on an additional opportunity for member engagement in the Society. Dr. Kaplan outlines what a KEG is, how it differs from other groups within SCCM, and how to get engaged in one these special interest groups. This is truly a great read to provide you with information on another opportunity for to benefit from your membership in SCCM!

Sepsis has long been an important topic to critical care teams. Research and efforts to improve care have been a top priority for so many in our field. The first pediatric Surviving Sepsis Campaign (SSC) guidelines were recently released and published in *Pediatric Critical Care Medicine*. In the article, the importance of identifying and managing pediatric sepsis is highlighted to help the over 1 million children globally affected by this disease. One child who survived a sepsis diagnosis and is now an advocate for awareness of the disease

is Angelica Hale. Well known for her singing on America's Got Talent in 2017, Angelica performed at the opening session at SCCM's annual Congress and was the ICU Heroes Award winner.

The ICU Liberation initiative has recently focused on successful implementation in pediatric ICU. Karen Choong, MB, BCh, FRCP(C), and Samer M. Abu-Sultaneh, MD, FAAP, describe the elements of ICU Liberation in children. This important article highlights the need for culture change, a dedicated team, and a plan, similar to implementation in the adult ICU setting. With the application to pediatrics, those with sepsis may benefit from this process. Future quality improvement work is needed.

Rounding out the clinical spotlight on pediatric sepsis, the article by Jessica Turnbull, MD, MA, and Alexander Kon, MD, HEC-C-FAAP, FCCM, provides a case-based look inside an ethical dilemma associated with pediatric sepsis. Using SCCM publication guidance, the authors skillfully take the reader through the case. Interwoven into the case are essential factors to consider when communicating ethically appropriate recommendations. This article artfully provides real-life advice to help in such a situation.

Although not focused on pediatrics, this issue address disparities in sepsis management and outcomes. Race and gender are highlighted as important disparities in managing sepsis. Although race may be an individual factor, the authors identify a variety of factors that contribute to race-related disparities. Notably, there is evidence that unconscious bias plays a role in sepsis management. It is helpful to shed light on these issues and begin the necessary work of breaking down the barriers.

How has pediatric sepsis workflow changed in your hospital since the publication of the SSC pediatric guidelines? Have you experienced similar ethical dilemmas in your workplace? Feel free to share your insights with our members on Twitter (@SCCM) and Facebook (facebook.com/SCCM1). As always, we welcome your feedback on *Critical Connections*. Please send your feedback to criticalconnections@sccm.org.

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SCCM and Its Members Rise to the COVID-19 Challenge

THERE IS NO DOUBT WE ARE LIVING IN A NEW WORLD. THE COVID-19 PANDEMIC IS CHALLENGING ORGANIZATIONS AND INDIVIDUALS TO REACT QUICKLY AND ADAPT OVERNIGHT. SINCE THE FIRST REPORTS OF A NOVEL CORONAVIRUS EMERGED, THE SOCIETY OF CRITICAL CARE MEDICINE (SCCM) DELIVERED NEED-TO-KNOW INFORMATION TO A GLOBAL AUDIENCE, PROVIDING EDUCATIONAL RESOURCES, ADVOCATING FOR INTENSIVE CARE UNIT (ICU) CLINICIANS, AND COLLABORATING WITH ORGANIZATIONS, GOVERNMENTS AND INDIVIDUALS WORLDWIDE.

Training the Non-ICU Clinician Workforce

With a robust collection of training materials designed for those not trained in critical care, SCCM quickly assembled vital videos and book chapters from its Fundamental Critical Care Support (FCCS) and Fundamental Disaster Management (FDM) programs and made them immediately and freely available online. With hospitals around the globe clamoring for opportunities to train non-ICU clinicians in preparation for patient surges, the program was immediately embraced, with more than 152,000 accessing it during the first week. The Society anticipated high usage and so, before release, ensured that the site could handle unprecedented traffic. Since its launch in early March, the program has been used by over 500,000 clinicians and is offered in Japanese, Spanish and Portuguese.

Sounding the Alarm on Staffing and Ventilator Shortages

With the publication of the report, United States Resource Availability for COVID-19, SCCM set out to prepare the U.S. critical care workforce, hospital administrators, government officials, and the public for the crisis that would emerge with a major patient surge. The report warned of a “profound shortage of intensivists and other ICU healthcare workers available to operate mechanical ventilators” and offered a tiered staffing strategy to help hospitals expand critical care services in response to the pandemic. It also included previously unpublished statistics on such resources as ICU bed availability and ventilator supply. Accessed more than 140,000 times, the paper

found wide distribution among its intended audiences, including major media outlets such as the NBC Nightly News and *The New York Times*. This publication placed SCCM at the center of public attention as the pandemic unfolded in the United States. By May, SCCM members had participated in more than 110 media interviews, leading to more than 2,700 stories and reaching an audience of 6.7 billion people. Merriam-Webster added the word “intensivist” to its dictionary.

SCCM also worked with numerous organizations and government agencies in efforts to augment ventilator supplies and provide strategies and guidance for those in the field who faced shortages. SCCM President Lewis J. Kaplan, MD, FACS, FCCP, FCCM, was invited

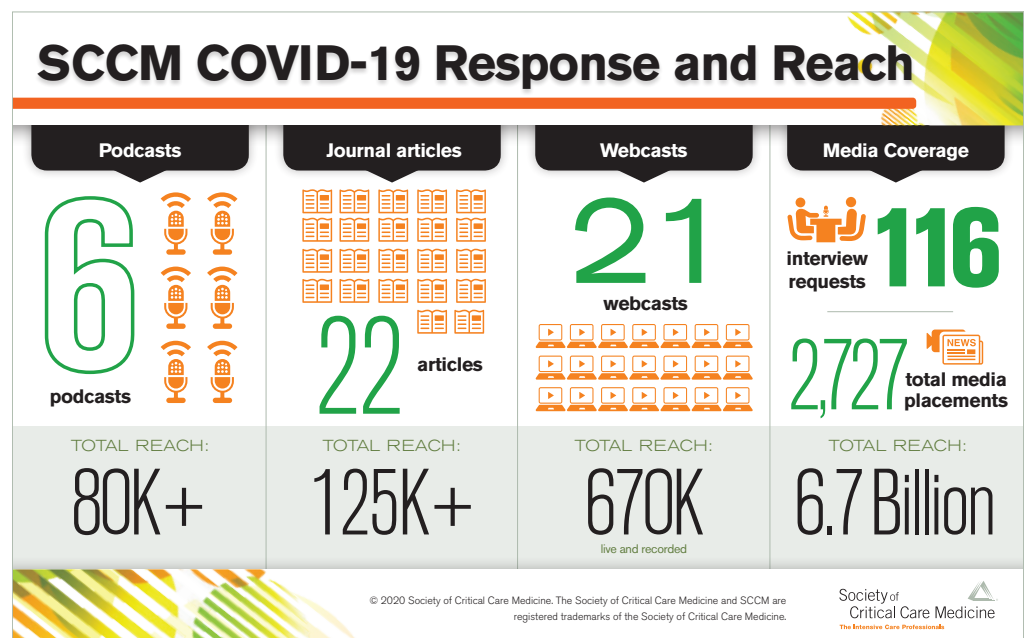
to the White House to provide expertise in this area, and he served on a Federal Emergency Management Agency (FEMA) task force to evaluate novel ventilator methodologies and equipment. This resulted in the publication of a document from the COVID-19 Co-Ventilation Task Force, producing guidance for clinicians who may find themselves out of options in an emergency surge.

Serving as the Voice of Critical Care

Throughout the COVID-19 pandemic, it is vital that the voice of critical care professionals caring for patients on the front lines be heard. These clinician heroes are saving lives, risking their own health, and serving in spite of the potential for spreading the infection to their loved ones. SCCM advocated for more and better personal protective equipment, mental health resources, expansion of visas, and direct financial support for clinicians in numerous meetings with U.S. governmental leaders and through letters to the U.S. Congress and Senate, as well as the Trump Administration.

SCCM leaders regularly fielded calls for guidance from the White House, FEMA, the Centers for Disease Control and Prevention (CDC), and other government agencies, positioning SCCM as the leading resource for care of the critically ill COVID-19 patient. The Society continues to partner with these federal entities in seeking complete resolution of the outbreak.

Continued on page 19



Enhancing Society Flexibility by Tapping a KEG



Lewis J. Kaplan, MD, FACS, FCCP, FCCM, is a general, trauma, and critical care surgeon at the Perelman School of Medicine at the University of Pennsylvania in the Division of Trauma, Surgical Critical Care, and Emergency Surgery and also serves as the section chief of surgical critical care at the Corporal Michael J. Crescenz VA Medical Center.

PROFESSIONAL ORGANIZATIONS ARE OFTEN BUILT UPON STRUCTURES THAT SUPPORT BOTH ORGANIZATIONAL AND MEMBER NEEDS. Unsurprisingly, even highly effective structures may not readily embrace flexibility in meeting rapidly evolving needs or responding to novel perspectives. Nonetheless, finding a durable mechanism that can fluidly adapt to unique perspectives or foci is an important imperative for organizations that wish to meet emerging member challenges.

The Society of Critical Care Medicine (SCCM) believes in meeting member needs in a variety of ways. Members are familiar with some of these, including the Fundamental Critical Care Support (FCCS) line of educational materials, which continually releases new courses in response to member needs, the latest of which are FCCS: Obstetrics, FCCS: Resource Limited, and FCCS: Surgical. The Society also has enhanced the Strategic Planning Process to better engage members in developing and submitting new proposals. However, members may be less familiar with the Society's newest approach to engagement, the Knowledge Education Group (KEG). Let's explore how to "tap a KEG" by understanding what a KEG is and does, as well as how to access an existing KEG.

KEGs are different than committees, task forces, or work groups in important ways.

First, KEGs are informal groups of members who all share a common interest.

Second, the KEG does not have a formal "charge" from the Society outlining a specific task to be completed. In this way, KEGs are free to pursue knowledge or education deemed important or of interest in whichever way they believe is most ideal.

Third, unlike groups with a formal charge – and therefore directed resources – KEGs are not underpinned by staff support or funding. Instead, KEGs are potent sources of energy, drive, and ingenuity from which novel Strategic Planning Proposals may spring. In fact, with the changes in the Strategic Planning process that send Requests for Proposals (RFPs) to members in the fall, KEGs may be uniquely positioned to address emerging areas for exploration.

Fourth, because KEGs are self-assembling and do not require completion of a volunteer application for membership, they are fabulous sources of potentially unknown or unengaged talent.

Fifth, because KEGs generally enjoy membership across SCCM Sections, multiprofessional participation is a KEG hallmark. This is especially important as diversity is highly prized in multiple venues and is a domain in which the Society excels!

Currently, SCCM recognizes six KEGs: Obstetrics, Women In Critical Care, Choosing Wisely, Data Science, Geriatrics, and Coding



KNOWLEDGE EDUCATION GROUPS (KEGS)

KEGs are informal groups within SCCM that come together to advance a specific area of knowledge. Join a KEG to connect with other SCCM members interested in a specific subject.

How to Join a KEG

- Log into sccm.org/connect
- Find your KEGs
 - Obstetric Critical Care KEG
 - Choosing Wisely KEG
 - Women in Critical Care KEG
 - Data Science KEG
 - Research Knowledge Education Group (Discovery)
 - More are added all the time!
- Start posting you questions and meeting new people!

Obstetric Critical Care KEG

The Obstetric Critical Care Knowledge and Education Group (KEG) aims to connect nurses, intensivists, anesthesiologists, surgeons, obstetricians, perinatologists, pharmacologists, respiratory therapists, and others interested in the care of critically ill obstetric patients.

The goal is to bring together professionals from different disciplines to improve clinical practice, quality of communication, and education in obstetric care, develop research collaborations, as this group of patients is usually left out of clinical trials, and understand international differences in maternal critical care.

Join the Obstetric Critical Care KEG to join in the conversation, connect with other participants, and access the library of resources.

- Send a message to other members
- Upload resources to your group in the File Library
- Pose questions and start discussions in your group's Forum
- Manage your account and communication preferences

[Join this KEG](#)

Recent Messages [show all]

- Re: COVID-19 & OB
Dr. William Edward Wagner
- Re: COVID-19 & OB
Dr. Marie R. Baldisseri
- COVID-19 & OB
Dr. Lamia K. Atasi

Recent Library Items [show all]

- COVID-19 Retrospective Study from China 2020
- Critically ill obstetric patients in an American and an Indian public hospital...
To compare case-mix, health care practices, and outcome in obstetric ICU admissions in inner-city te...
- Pregnancy and Heart Disease
Maternal heart disease has emerged as a major threat to safe...

SCCM ENGAGEMENT

You are in the Diamond Tier



What is an SCCM engagement score or engagement index? This is a numeric means of identifying all of an individual member's Society-related activity. Activities can take various forms: Congress attendance and participation, committee membership or leadership, liaison service, course registration, fellowship in the American College of Critical Care Medicine, earned awards (such as the Presidential Citation), educational material purchases, and charitable contributions. Engagement scores are grouped into ranges and then tied to a unique identifier.

References and disclosures:
available at sccm.org/criticalconnections

and Billing. Other KEGs, such as Ethics and Palliative Care, are under development, and more groups are expected to enter the pipeline soon. Because KEGs are SCCM internal entities, all participants must be members. Furthermore, KEGs are required to align with one of SCCM's recognized knowledge lines: Administration, Cardiovascular, Disaster, Endocrine, Epidemiology/Outcomes, Ethics/End of Life, GI/Nutrition, Hematology, Immunology, Infection, Integument (skin), Neurology, Obstetrics, Patient and Family Support, Pharmacology, Procedures, Professional Development, Pulmonary, Quality and Patient Safety, Renal, Resuscitation, Sepsis, Shock, and Trauma.

Each of the approved KEGs supports an important area of inquiry or education. The process for establishing a new KEG is straightforward. An application must be completed and should be supported by a needs assessment, as well as an initial grouping of 50 members in good standing, all of whom are interested in that specific knowledge area. The entire group must designate two initial cochairs, each of whom have earned a diamond or platinum SCCM engagement score.

Tiers ascend in numeric ranges and identifiers: copper, bronze, silver, gold, diamond, and finally platinum. (Sorry, no vibranium for Marvel fans.) When logging into MySCCM.org, you can locate your membership type at the bottom left of the screen. Below that is your engagement score and the range within which it falls. Here is mine, by way of example. My membership started in 1997, and my engagement score reflects all of my SCCM activity to date.

Does KEG participation impact your engagement index? You may rest assured that it does!

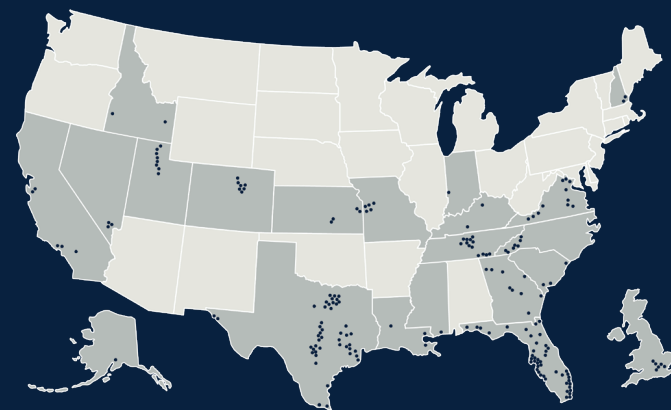
Other members, as well as leadership, may access KEGs when a specific expertise is needed around a particular issue or activity. This is one reason why each KEG has two cochairs; they serve as access points for everyone. Additionally, each KEG engages members, at a minimum, through a yearly in-person meeting at Congress. The time and location of each KEG meeting is posted within the SCCM Congress App. Congress 2021 will be a celebration of SCCM's 50th Anniversary, so tapping a KEG might provide a superb method for celebrating in more than one way!

Taking better care of ICU patients

Intensive Care Consortium (ICC) has joined HCA Healthcare to change the way critical care medicine is delivered.

The intensivists who work in our intensive care units are proud to be part of one of the top critical care programs in the country. We constantly invest in and develop the latest innovations in treatments, technologies, and processes that lead to better outcomes for our patients.

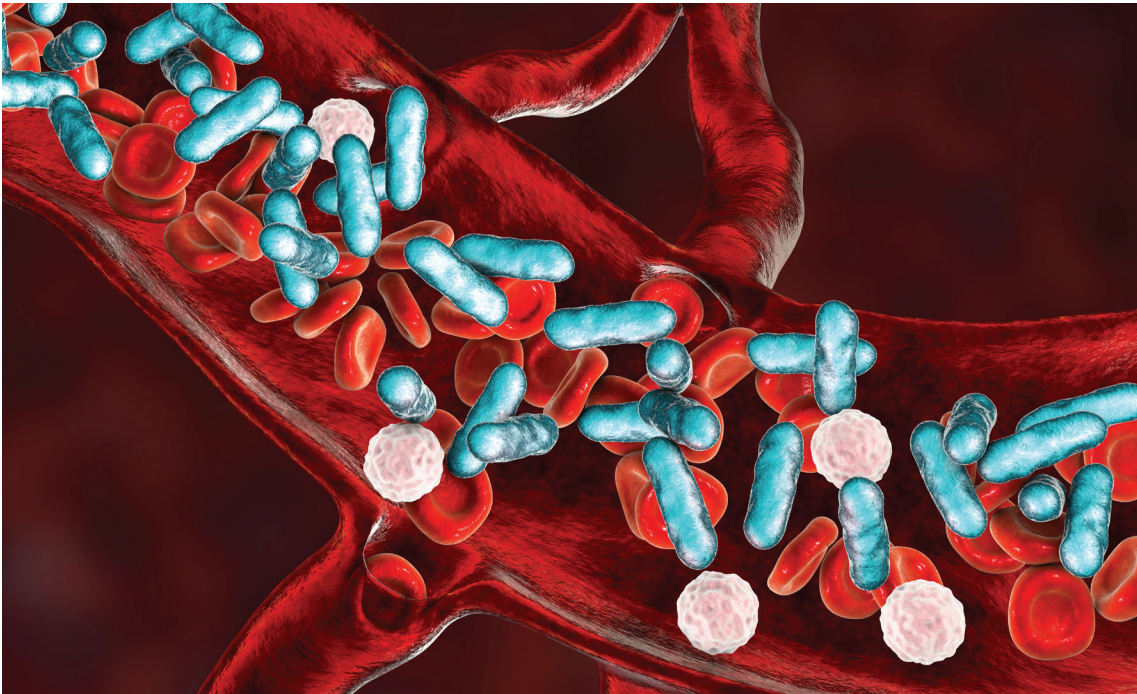
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Surviving Sepsis Campaign Releases First Guidelines for Sepsis in Children

The Surviving Sepsis Campaign (SCC) in February released its first guidelines for pediatric patients with sepsis, marking a new milestone in the initiative's mission to improve sepsis care and save lives.

More than 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.

Establishing a two-phase process for identifying and managing sepsis in children that includes 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*. The guidelines are a valuable resource for hospitals

**TAKE YOUR
GUIDELINE
IMPLEMENTATION
TO THE NEXT
LEVEL**

Visit survivingsepsis.org to find the resources needed to implement the pediatric SCC guidelines.

**Surviving Sepsis
Campaign**

looking to implement screening and protocols to facilitate timely recognition and treatment for children with sepsis and septic shock, as the disease can be overlooked in young patients because low blood pressure may not occur until very late in illness. Healthcare providers should consider other assessments of abnormal blood flow beyond blood pressure, including pulse strength, capillary refill, and hand and foot temperature.

"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 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 include:

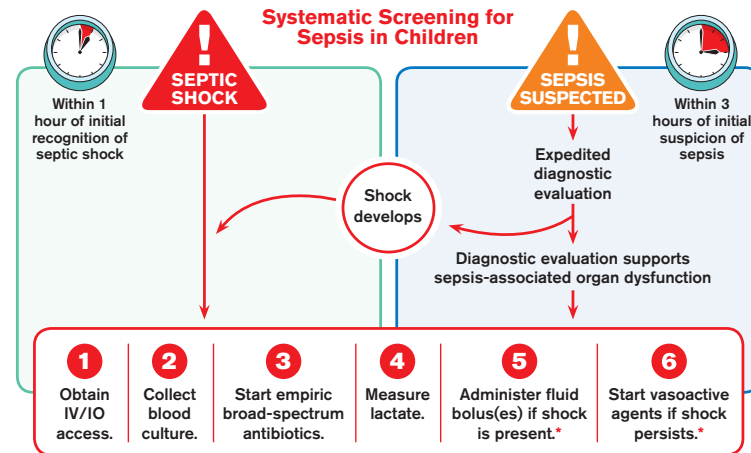
- Children who are being treated in hospitals with intensive care units should be provided up to 40-60 mL/kg bolus fluid in the first hour of treatment, based on cardiac output and discontinued if they exhibit signs of fluid overload. However, healthcare systems without intensive care units may not have 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.

The SSC 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 guidelines were developed by 49 international experts from a variety of disciplines representing 12 international organizations, three methodologists and three public members.

Deep Dives

Algorithms

Algorithms endorsed by at least nine other professional organizations provide a guide for systematic screening for sepsis in children and guidance for care in settings both with and without intensive care services.



SCCM Pod-406 Surviving Sepsis Campaign Children's Guidelines

An interview with guidelines chair Scott L. Weiss, MD, FCCM, offers an in-depth review of the recommendations as outlines the differences between the new pediatric SSC guidelines and the adult guidelines as well as previously published works that addressed pediatric septic shock.



Presentation from the 49th Critical Care Congress

Leaders in the SSC presented their work at the Society of Critical Care Medicine's annual meeting, covering the methodology as well as recommendations for antimicrobials, hemodynamic resuscitation, mechanical ventilation and adjunctive therapy.

Speakers

- ❖ Niranjan Tex Kissoon, MD
- ❖ Pierre Tissieres, MD DSc
- ❖ Waleed Alhazzani, MD, MSc
- ❖ Scott L. Weiss, MD, MSCE

Teaching Slides

Support clinicians looking to teach others and gain buy-in.

APPLY NOW FOR SCCM AWARDS

Critical care professionals are elevating and improving care in all kinds of ways. Celebrate successes and achievements by applying for SCCM's awards. We offer more than 20 opportunities for SCCM members and their teams.

Visit sccm.org/awards for a complete list and to start your application or nomination

Most applications are due August 1, 2020

NEW Innovation in Education Award
Excellence and creativity in the development of an innovative educational program

NEW Patient Safety First! Award
Novel, effective patient safety initiatives for critically ill and injured patients

Drs. Vidyasagar and Nagamani Dharmapuri Award

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Dr. Joseph and Rae Brown Award

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Grenvik Family Award for Ethics

Contributions toward addressing ethical problems in critical care

Norma J. Shoemaker Award

Excellence in nursing clinical practice, education and/or administration

Barry A. Shapiro Memorial Award for Excellence in Critical Care Management

Design or implementation of evidence-based practices that have improved clinical, operational or fiscal outcomes

Family-Centered Care Innovation Award

Novel approaches to compassionate care

Safar Global Partner Awards

Contributions to help SCCM achieve its international strategic priorities

ICU Design Citation

ICUs design excellence with attention to both functional and humanitarian issues

From the PICU to America's Got Talent: Angelica Hale's Story



Most people know Angelica Hale as the tenacious young lady who won hearts with her incredible performances on America's Got Talent in 2017. But before she became the youngest runner-up in the show's history, she was a severely ill four-year-old with sepsis and kidney failure.

Angelica, her family, and her care team at Children's Healthcare of Atlanta at Egleston—led by Toni M. Petrillo, MD, FAAP, FCCM, medical director of the pediatric intensive care unit (PICU) and Jana A. Stockwell, MD, FAAP, FCCM, director of the Division of Critical Care Medicine—received the Society of Critical Care Medicine's (SCCM) ICU Heroes Award during the 49th annual Critical Care Congress.

The award recognizes that patients and families are an integral part of ICU care and that it takes a multiprofessional team to provide the best care to patients. The award is given to both a pediatric and an adult ICU.

Angelica's recovery is a testament not only to her strength and the unwavering support of her parents, who worked closely with Angelica's healthcare team, but to the importance of a fully integrated and multiprofessional team in caring for patients in the ICU.

"It takes a village to treat a child this sick, and the entire team—nurses, intensivists, surgeons, respiratory therapists, social workers, physical therapists, occupational therapists, speech therapists, the transport team, and many more—were an integral part of getting Angelica home," Dr. Stockwell said. "When we first met her, she was a very ill child and so to see her flourishing now is incredibly rewarding."

In 2012 when Angelica Hale was four years old, she became critically ill with severe pneumonia and sepsis from a pneumococcal bacterial infection. She needed lifesaving medical intervention and was transported from

an outside children's hospital to Children's Healthcare of Atlanta at Egleston where she was started on extracorporeal membrane oxygenation (ECMO) in the PICU. Angelica's septic shock resulted in multiple organ failure, including her kidneys, which did not recover. Hemodialysis and, later, peritoneal dialysis became her new normal.

Throughout her time in the PICU, Angelica's family participated in daily rounds, during which the team of physicians, bedside nurses, respiratory therapists, ECMO specialists, pharmacists, and nutritionists all played significant roles. This experience can be incredibly overwhelming for patients and their families but Angelica's parents participated each day. "Angelica's family is incredible, and having that kind of support is so important," Dr. Petrillo said.

After 80 days in the hospital, Angelica went home but her life was forever changed. After a year and a half of dialysis, on September 13, 2013, Angelica received a kidney transplant from her mother. Four years later, the once critically ill four-year-old who loved to sing became a sensation who at the age of nine impressed the nation with her singing and infectious spirit.

When Angelica competed on America's Got Talent, no group of people cheered more loudly than those who cared for her in the PICU at Children's Healthcare of Atlanta at Egleston. In addition to pursuing her career, Angelica is a celebrity advocate for the Sepsis Alliance and Children's Miracle Network Hospitals as well as an ambassador of the National Kidney Foundation.

ICU HEROES AWARD

Recognize heroic ICU patients, their family members, and your ICU team. Apply for the ICU Heroes Award by August 1.

Mayo Clinic Continues to Share Success with Pediatric ICU Liberation



IMPLEMENTING ELEMENTS OF THE SOCIETY OF CRITICAL CARE MEDICINE'S (SCCM) ICU LIBERATION BUNDLE (formerly referred to as the A-F Bundle) improved overall patient care; increased nurse confidence in screening, preventing and addressing delirium; enhanced interprofessional communication during bedside family rounds, and helped patients function better after discharge, according to Yu Kawai, MD, pediatric critical care specialist and the QI medical director of pediatric intensive care unit (PICU) at Mayo Clinic Children's Center and Pediatric ICU Liberation Collaborative participant.

The sessions featured information about the ICU Liberation Initiative – which aims to liberate patients from the harmful effects of pain, agitation/sedation, delirium, immobility, and sleep disruption that are common after ICU stays – and offered insights on the bundle's implementation from ICU Liberation Collaborative members.

Dr. Kawai was one of many who shared their success stories implementing the elements of the bundle during ICU Liberation Lab sessions at the 49th Critical Care Congress. His team members have been leaders in implementing the ICU Liberation Bundle in a pediatric setting, since the Mayo Clinic participated in the SCCM's Pediatric ICU Liberation Collaborative more than three years ago. In 2018, the team presented an abstract at the annual meeting, *The Pediatric ICU Liberation Project Impact on Patient Outcomes: The Mayo Experience*, which touted early success in reducing length of stay in the ICU and the hospital and as well as reduced days on mechanical ventilation.

Dr. Kawai said the first step in successful implementation is gaining support from departmental and divisional leadership and ensuring participation from the interprofessional team, notably the bedside nurses, respiratory therapists, pharmacists, mobility therapists, child life experts, and families. He explained that it is critical to have

a champion from each discipline as many of the bundle components are performed by non-physicians. Once the interprofessional PICU team understood how it would improve care and began tracking and implementing the various elements and tasks, the benefits became clear. For example, a daily 10-minute ICU Liberation huddle with the team prior to morning rounds improved communication and ensured all of the patient's liberation needs were met.

In addition, incorporating the ICU Liberation Bundle elements into a daily, bedside nursing rounding script was monumental in shifting the culture to focus on the liberation efforts. They found that the entire team performed more bundle element tasks aimed at alleviating adverse symptoms and became more involved in having regular discussions regarding de-escalation of care with the interprofessional team, which in turn increased family engagement, an important factor for improving outcomes in these children.

"Nurses were more confident in screening, addressing and understanding how to prevent delirium, and in turn, the prevalence of delirium decreased significantly. Preliminary data, unadjusted for severity of illness, showed a positive trend towards decreased mechanical ventilator days, shorter length of stay in the PICU, and improved functional status at the time of discharge," Dr. Kawai said.

The ICU Liberation labs also addressed success stories from Tennessee Valley Healthcare Systems in Seattle and Atrium Health in Indiana, in addition to providing team rounding and early mobility demonstrations.

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Applying the ICU Liberation Bundle to Critically Ill Children



Advancements in pediatric critical care have led to improved patient survival. Unfortunately, this has been accompanied by an emerging population of pediatric survivors who suffer persistent physical, cognitive, emotional, psychological, or social disabilities, collectively known as *post-intensive care syndrome-pediatrics*.¹ To combat these critical illness sequelae, the Society of Critical Care Medicine (SCCM) introduced the ICU Liberation Initiative to reduce harm and improve recovery in adults and children.² The ICU Liberation Bundle (formerly referred to the ABCDEF Bundle) consists of interconnected elements that aim to reduce the harmful effects of excessive sedation, prolonged immobilization, sleep disruption, and delirium by enabling wakefulness, comfort, spontaneous breathing, and early mobilization. Its efficacy, as well as a dose-response effect to ICU liberation, has been reported to impact several clinically meaningful, patient-centered outcomes in adults.^{3,4} While the ICU liberation guidelines target both adult and pediatric populations, guidance on how to best apply this practice in children is lacking.

The aim of this article is to provide pediatric intensive care unit (PICU) practitioners with general guidance on implementation of the ICU Liberation Bundle. Learning from the adult collaborative efforts and single-center pediatric initiatives, the pediatric critical care community can use the following keys to success in their PICU liberation implementation journey (Table 1).

Application of ICU liberation is relatively new in pediatric care and represents a change in unit culture that takes time, resources, continual effort, auditing, and feedback for success. An essential first step is to apply an implementation framework that involves stakeholder engagement, an education and execution plan, and a process for evaluating the impact of implementing ICU liberation in the PICU.⁵ Establish a representative team of interprofessional champions that includes physicians, nurses, respiratory therapists, rehabilitation specialists, and other healthcare

and family representatives. Assign agreed-upon roles and responsibilities for each team member, and set reasonable timelines to achieve the team's goals. Tailor the bundle to the needs of your unit by assessing current unit practices, knowledge gaps, potential barriers, and facilitators to successful implementation. Determine which bundle elements to prioritize and implement initially, then develop a stepwise plan and timeline for rollout of each element. Implementation of the PICU Liberation Bundle represents an investment of resources, so communicate regularly with the hospital and PICU leadership to ensure ongoing support and buy-in. Engage leadership on the benefits of PICU liberation and the strong evidence of its cost effectiveness.^{6,7}

Use of validated pediatric assessment tools for each of the elements of the bundle is crucial; integrate these tools in the electronic medical record, if possible. Using such objective measures facilitates communication between team members and allows for objective goal setting and assessment of daily targets. Introducing practice guidelines informed by the best available evidence supports knowledge for practicing each bundle component, in particular sedation, delirium prevention, and early mobilization.^{8,9}

A: Assess, Prevent, and Manage Pain

Controlling pain is one of the most important elements of ICU liberation. The key to managing pain and discomfort is the application of routine, objective assessments. The revised Face, Legs, Activity, Cry, Consolability (FLACC) scale, Wong-Baker Faces Pain Rating Scale, and numeric rating pain scale are pediatric tools that can be applied to a broad age range.¹⁰ To ensure a "less is more" approach, consider nonpharmacological adjuncts and nonopioid agents as first-line treatment, followed by judicious use

of opioids for analgesia. As with any medication, beware of the adverse effects of opioids, such as respiratory depression, constipation, and risk of tolerance and dependence.

B: Both Spontaneous Awakening Trials and Spontaneous Breathing Trials

While spontaneous awakening trials are not commonly used in the PICU, care providers should strive to optimize the patient's level of sedation, depending on the stage of illness, to allow the patient to be awake and spontaneously breathing when possible. While a number of validated tools are used to assess the level of arousal in the PICU, the State Behavioral Scale (SBS) and the Richmond Agitation and Sedation Scale (RASS) are increasingly employed as they may be used in mechanically and nonmechanically ventilated children, and they are used as the initial step to pediatric delirium assessment.¹⁰⁻¹²

Daily screening to assess the patient's eligibility to undergo a spontaneous breathing trial is essential to reduce invasive mechanical ventilation duration and its associated morbidities.¹³ Given their expertise and greater availability at bedside, the respiratory therapists (with help from nursing team and physicians) are the ideal personnel to identify who is eligible to undergo breathing trials and to perform those trials.¹⁴ In PICUs lacking respiratory therapists, the nursing team can perform this task.

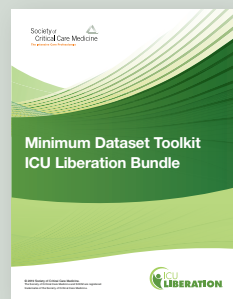
C: Choice of Analgesia and Sedation

Sedation is typically given to facilitate invasive critical care interventions; however, most intubated children are excessively sedated, which is the key risk factor for the acquired morbidities of delirium, iatrogenic withdrawal, and immobility. ICU liberation promotes an analog-sedation approach, targeting lighter

Table 1.

KEYS TO SUCCESSFUL PICU LIBERATION IMPLEMENTATION

- Establish a team of interprofessional champions.
- Obtain leadership buy-in.
- Use age-appropriate validated assessment tools.
- Integrate the assessment tools in the electronic medical record.
- Establish prevention and management best practice guidelines for each element of the ICU Liberation Bundle.
- Continue to audit adherence to each of the bundle elements, and plan feedback to ensure sustainability.



The ICU Liberation Bundle is unique in that it can be applied to every patient, every day, by the full team. Your implementation does not have to be perfect immediately; small changes make a big difference. No matter where you are in the process, SCCM can help you get to the next benchmark of quality improvement.

You have three ways to get started with ICU Liberation:

- Download the FREE ICU Liberation Minimum Data Set Toolkit and supporting resources to get started.
- Purchase the ICU Liberation Bundle, which includes a textbook and On Demand presentations to educate your team.
- Learn about hosting an ICU Liberation licensed course. This course will be available for institution on-site hosting in spring 2020.

For more information, visit sccm.org/iculiberation

levels of sedation where possible and titration of sedatives based on objective goals.^{8,15} This approach has been shown to be feasible and safe in critically ill children.¹⁶⁻¹⁸ The increasing evidence of the relationship between benzodiazepines and delirium and sleep disruption has led to a preference for opioids and an increased interest in α_2 agonists, such as dexmedetomidine.¹⁹ Using nonpharmacological adjuncts, implementing sleep best practices, and tying together other aspects of the bundle, such as family-centered care, can facilitate comfort and may alleviate excessive sedative use.

D: Delirium: Assess, Prevent, and Manage

Delirium is as common and important in critically ill children as it is in adults.^{20,21} Therefore, routine delirium monitoring should be the standard of care in all PICUs, and strategies to prevent delirium should be prioritized. Two validated delirium screening tools are available for use with children: the Cornell Assessment of Pediatric Delirium (CAPD), which can be used for pediatric patients of any age, and the Pediatric Confusion Assessment Method for the Intensive Care Unit (pCAM-ICU), which can be used for patients older than 6 months.²²⁻²⁴ Delirium prevention can be achieved by promoting day-night cycles through daily routines (ie, physical activity during the day, sleep promotion at night) and minimizing exposure to medications that contribute to delirium, such as benzodiazepines and anticholinergic agents. Antipsychotic medications should be considered if nonpharmacological strategies alone are ineffective, symptoms are distressing to the patient, and delirium perpetuates sleep disruption.

E: Early Mobility and Exercise

Pediatric early mobility programs consist of the following elements:

screening the patient for readiness to mobilize each day, targeting the highest level of mobility that can be safely achieved based on the patient's stage of illness, and ensuring that mobility occurs through a coordinated, collaborative team effort.^{25,26} Mobility targets ideally should progress from in-bed, to edge-of-bed, and ultimately out-of-bed functional mobility. Special attention should be paid to safety during mobilization to prevent accidental device disconnection or dislodgement, and to the patient's tolerance and cardiorespiratory response.

F: Family Engagement and Empowerment

Many PICUs have adopted patient- and family-centered interprofessional daily rounds, empowering families to be part of the decision-making process for the patient's daily care. Structured family care conferences can be used to establish long-term goals of care. Family engagement is key to the success of many elements of ICU liberation, such as providing comfort, promoting sleep, and facilitating mobilization and day-time activity, all of which serve to minimize pharmacological interventions. The SCCM's Patient-Centered Outcomes Research-ICU Collaborative is an example of how to engage families in care of the critically ill child.²⁷

Integration of Good Sleep Hygiene

Another element of ICU liberation is under consideration: promoting integration of good sleep. Critically

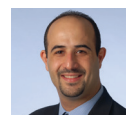
ill children are at risk for sleep disturbance, which may lead to escalation in sedative use, prolonged mechanical ventilation, delirium in the short term, and neurocognitive sequelae in the long term.²⁸ Management of sleep disturbances starts with the routine evaluation of baseline sleep preferences or routines, and monitoring of sleep quality using subjective assessment scales while the patient is in the PICU.²⁸ Good sleep can be achieved by ensuring wakefulness, promoting physical activity, and minimizing naps during the day; observing the child's usual bedtimes and supporting sleep hygiene by decreasing noise, light, and screen time at night. Minimize sleep disruption by clustering nursing care; observe the patient's usual routines and preferences where possible (ie, feeding times, optimal temperature, sleep position); treat pain; and when necessary, as a last resort, use sleep aid medications, such as melatonin.

The Future of ICU Liberation for Pediatric Patients

The future of ICU liberation within the PICU relies on establishing a multicenter, quality improvement, learning collaborative. This collaborative would be used as platform for exchanging information on successes, challenges, and resources among the various PICU teams. ICU liberation provides interested teams with tools and a data set toolkit to assess, implement, and evaluate the success of implementation of each element of the ICU Liberation Bundle.



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Scvo₂ in Sepsis: A Measurement Provided by Respiratory Care Practitioners

When treating patients with sepsis, intensive care unit (ICU) and emergency department clinicians have learned that improved outcomes occur when staff members work together as a team. This article outlines the value of central venous oxygen saturation (Scvo₂) measurement in sepsis patients, emphasizing the role of the respiratory care practitioner in measuring Scvo₂ using blood gas oximetry.

The measurement of Scvo₂ has a controversial role in patients with sepsis. To review its value, remember that this measure is a surrogate for tissue oxygen consumption in the upper body. Decreased Scvo₂ reflects an increased difference in oxygen leaving the left ventricle minus oxygen returning to the right ventricle. The normal value for Scvo₂ is 65% to 70%. The lower the Scvo₂, the more inadequate the blood supply to tissues.

To further understand Scvo₂, we'll first need to review the equation for oxygen delivery (Do₂), where arterial oxygen saturation (Sao₂) from the arterial blood gas measurement or arterial pulse oxygen saturation (Spo₂) from arterial pulse oximetry is a factor.

$$Do_2 = CO \times Cao_2 = CO \times ((1.34 \times Hgb \times Sao_2) + (0.0031 \times Pao_2))$$

Where CO is cardiac output (L/min); Cao₂ is content of arterial oxygen (g/dL); the constant 1.34 is the amount of oxygen (mL) at one atmosphere bound to 1 gram of hemoglobin (Hgb); the constant 0.0031 is the amount of oxygen dissolved in 1 milliliter of plasma; and Pao₂ is the partial pressure of oxygen (mm Hg). As the two constants indicate, the majority of oxygen content is bound versus dissolved. Recall that this remains true even though Sao₂ is inserted in the equation as Sao₂/100.

As oxygen delivery accounts for the oxygen provided to the tissues, the Scvo₂ reflects the consumption of oxygen by the tissues. Although tissue oxygen consumption cannot be easily measured in an ICU patient, the difference between oxygen delivery and consumption is

reflected by the $Scvo_2$. Oxygen leaves the left ventricle, travelling throughout the body where the organs take oxygen as needed. As the blood returns to the right atrium, the reduction in oxygen saturation (from Sao_2 to $Scvo_2$) reflects the oxygen consumed by the organs. Therefore, the difference between Sao_2 and $Scvo_2$ is a measure of oxygen consumption, specifically in the internal jugular (IJ) or the subclavian (SC) vein. Of course, the blood gas sample for Svo_2 cannot be drawn from either a femoral or a peripheral vein if the goal is to measure total tissue oxygen consumption.

In patients with sepsis, oxygen delivery must meet tissue consumption to avoid hypoxic injury to tissues. The patient with sepsis can be assessed for adequacy of oxygen delivery versus consumption using the $Scvo_2$ value. For example, if $Scvo_2$ is 65% to 70%, delivery versus consumption is normal; if $Scvo_2$ is below 65%, the consumption exceeds delivery; if $Scvo_2$ is below 40%, consumption exceeds delivery by such a large amount that hypoxic damage to the tissues increases and the risk of mortality increases.

Technique for drawing a blood gas sample for $Scvo_2$ measurement

For those interested in accurate $Scvo_2$ measurements, attention must be given to drawing the blood gas sample, avoiding the common error of introducing an air bubble into the specimen. Any blood gas sample mixed with an air bubble will have an altered oxygen saturation value, because that bubble of room air contains a partial pressure of oxygen of 149 mm Hg, per the alveolar gas equation. This is higher than the normal venous oxygen pressure of 35 to 40 mm Hg in a sample drawn from a central venous catheter (CVC). Depending on the volume of the air bubble and the volume of the blood sample, a falsely elevated $Scvo_2$ value can result. To minimize air bubbles from contact with the central venous sample, the ICU respiratory care practitioners have standardized this technique for drawing each $Scvo_2$ sample.

Supplies:

1. Three-way stopcock (1)
2. Luer-Lok syringes, 10-12 mL (2)
3. Blood gas sample syringe, no needle, with air purge cap (1)
4. Saline flush, 10 mL (1)

Technique:

5. Select the port of the CVC for the blood gas sample; stop any medication infusion.
6. Close the slide valve of the CVC port.
7. Remove the intravenous medication tubing.
8. Attach a three-way stopcock to the CVC port, with the stopcock to the port off.
9. Open the slide valve
10. Connect one Luer-Lok syringe (waste) to the stopcock.
11. Turn the stopcock off to the 90-degree open port.
12. Remove waste blood, 5 mL.
13. Remove the waste syringe and discard.
14. Connect the second Luer-Lok syringe (sample) to the stopcock.
15. Remove sample blood, 5 mL.
16. Turn the stopcock off to the CVC port.

The respiratory care practitioner who measures and reports $Scvo_2$ shows an understanding of the physiology of sepsis, oxygen delivery, and oxygen consumption.

17. Press the sample syringe to push blood into the open stopcock port until the air in that port is expelled.
18. Press all air out of the blood gas syringe by depressing the plunger to empty the air.
19. Place the blood gas syringe securely onto the stopcock
20. Depressing the sample syringe, but NOT pulling on the plunger of the blood gas syringe, transfer 1-2 mL of blood through the stopcock into the blood gas syringe.
21. Remove the blood gas syringe from the stopcock and apply the cap.
22. Express air from the cap.
23. Place the syringe in a biohazard bag.
24. Close the slide valve of the CVC port.
25. Remove the stopcock.
26. Flush the CVC port with saline.
27. Reconnect the intravenous medication tubing

Reluctance to Use $Scvo_2$ Values

Why aren't a greater number of $Scvo_2$ samples drawn from patients with sepsis? In the 2001 trial of early goal-directed therapy by Rivers et al, the $Scvo_2$ was measured in each patient.¹ Many discussions and debates followed over the inclusion and value of $Scvo_2$ in the sepsis resuscitation bundle. Between 2014 and 2015, three studies—ProCESS,² ARISE,³ and ProMISe,⁴ all published in the *New England Journal of Medicine*—concluded that $Scvo_2$ does not improve outcomes in sepsis patients. These three articles dampened enthusiasm and subsequent use of $Scvo_2$, but many advocates have remained vocal in their support. Vincent and De Backer published an editorial⁵ accompanying a 2018 article,⁶ noting that the ProCESS,² ARISE,³ and ProMISe⁴ studies did not include patients as sick as those in the study by Rivers et al. Vincent and De Backer pointed out that the average $Scvo_2$ for the Rivers patients was in the 40% range, while the average $Scvo_2$ for the patients in the subsequent three studies was approximately 70%. They proposed that $Scvo_2$ should have greater use as a marker for the severity of sepsis (ie, the greater the oxygen consumption, the lower the $Scvo_2$ and the higher the mortality). Methods to raise the $Scvo_2$ value and lower the mortality rate include transfusion with packed red blood cells and/or inotropes.

Conclusion

The respiratory care practitioner who measures and reports $Scvo_2$ shows an understanding of the physiology of sepsis, oxygen delivery, and oxygen consumption. Future use of the $Scvo_2$ value is expected to increase as more clinicians initiate controlled studies and present results in patients with sepsis.

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Disparities in Sepsis Management and Outcomes

The combined estimates of severe sepsis and sepsis amount to 50 million cases worldwide, accounting for 5.3 million deaths annually.^{1,2} Improvements in standards of care have decreased mortality rates since the initial publication of the Surviving Sepsis Campaign Guidelines in 2004.³ Subsequent updates to the guidelines have culminated in the 2018 creation of the hour-1 sepsis bundle.⁴ This latest initiative provides a more pragmatic approach for obtaining blood cultures and lactate measures, administering fluids and antimicrobials, and initiating vasopressors in a timely manner. As a result, hospital mortality from sepsis is now approximately 30%.

Nevertheless, disparities are found among different populations diagnosed with sepsis. Healthcare disparity is defined as a difference in the quality of care provided that is not due to access-related factors, clinical needs, preferences, or appropriateness of intervention. Racial and gender disparity in the recognition, treatment, and outcomes of sepsis has been well documented and is an area of ongoing research.

Large epidemiological studies have observed lower incidences of sepsis in women compared to men.^{5,6} This, in part, may be due to biological differences between the sexes. For example, hormones appear to influence the body's response to infection, including the ability of estrogen to attenuate organ damage.⁷⁻⁹ Differences in mortality, however, have not been consistently observed. In fact, some studies have observed higher mortality rates in women.¹⁰⁻¹² A large retrospective study of more than 18,000 patients reported an approximately 10% higher risk of hospital mortality in women with sepsis, despite accounting for confounders like age.¹⁰ In contrast, Xu et al observed a higher 1-year mortality rate

in men with sepsis than in women.¹¹ The recently published French and European Outcome Registry in Intensive Care Unit (FROG-ICU) study observed no sex-related differences in overall mortality at 1 year and in the subgroup of those with sepsis.¹² Some of the inconsistencies observed in survival differences between men and women possibly can be explained by differences in study design, differing definitions of sepsis, or control for confounding variables.

Treatment effects were assessed to determine the impact on survival between the sexes. Pietropaoli and colleagues observed that women were less likely to receive venous thromboembolism prophylaxis, invasive mechanical ventilation, and hemodialysis catheters and more likely to have code status limitations.¹⁰ While the DISPARITY study observed no difference in Surviving Sepsis Campaign resuscitation bundle compliance between men and women,¹³ the same researchers found that the mean time to antibiotic delivery for women being treated for sepsis or septic shock was 1.18 times longer than the time observed in men.¹⁴

Disparities have also been noted in racial minorities, as some studies have observed higher adjusted rates of complications and deviations from standards of practice in the management of sepsis in these groups compared with white populations.¹⁵ Although several factors, including poverty and reduced access to healthcare, could contribute to the poorer outcomes in racial minorities, variability in care persists despite adjustments.

Quality improvement initiatives and protocol development play a crucial role in improving patient care. Subsequent to mandated protocol-based sepsis treatment in New York, a consistent reduction in mortality from sepsis was seen.¹⁶ As protocol completion rates increased from 60.1% to 72.1% during the initial implementation of these best practices, sepsis-related hospital mortality rates declined from 25.4% to 21.3%. Interestingly, protocol completion rates were better in white patients (14 percentage-point increase) than in black patients (5.3 percentage-point increase). Hospitals that cared for a larger proportion of racial minorities lagged behind in keeping up with performance standards. Although the intention of this mandate was to improve patient care as a whole, the potential for widening disparities was not anticipated or addressed,

and the vigilance needed to prevent such occurrences was unrecognized. These gaps in the provision of appropriate care for all patients must be identified and addressed in a timely manner.

DiMeglio and colleagues looked at the various factors that result in racial disparities in sepsis management and put forth useful suggestions that could potentially narrow this gap.¹⁵ Several patient-, community- and environment-based factors seemed to propagate race-based disparities. A higher prevalence of several chronic comorbidities, including diabetes, obesity, and HIV, in black versus white populations predisposes to a higher likelihoods of developing sepsis and having worse



Racial and gender disparity in the recognition, treatment, and outcomes of sepsis has been well documented and is an area of ongoing research.

outcomes from it. The disparity between white and black populations is improving, but still exists, in the expected years of life that are free of activity limitations caused by chronic conditions. Low socioeconomic status, decreased access to preventative medical services, and lack of insurance in minority groups are factors associated with worse disease outcomes. The lack of insurance coverage could result in a delay in presentation to the hospital, which is clearly related to increased sepsis mortality and morbidity rates. Similarly, the lack of access to healthcare and preventative health services also plays an important role in sepsis-related healthcare outcomes for minorities. Interestingly, even when adjusted for socioeconomic status, blacks had a higher incidence of severe sepsis compared with their white counterparts. Factors other than socioeconomic status and access to healthcare clearly play a role in the racial disparities observed.

The role of unconscious bias in disparities in sepsis management cannot be overlooked. Schrader and Lewis investigated racial disparities in the emergency room triage process and reported that black patients had longer wait times and lower acuity ratings than white patients.¹⁷ These delays could have a huge impact on patient outcomes when treating sepsis, in which every minute in identification and treatment counts.

Given the possibility of disparities in how women and racial minorities with sepsis are treated, practitioners should identify and address potential sources of biases. Further research is needed to adequately assess the cause of disparities in sepsis mortality.

As a community of critical care providers and members of the healthcare system, we must seek to eliminate both gender-based and racial disparities in the care we provide for our patients. The first step in this process is acknowledgment of the problem. Targeted efforts at improving the access to, and quality of, healthcare provided to minority populations would be a step toward eliminating these barriers.



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FCCS in Sri Lanka

FOR MEDICAL PROFESSIONALS, THE OPPORTUNITIES TO CHANGE LIVES ARE ALL AROUND. Every day in practice, healthcare professionals are helping people lead healthier, more satisfying lives, right in their own backyards. But sometimes, the call to make a difference comes from farther afield, and doctors, nurses, and other care providers look for places outside their usual circles to improve healthcare systems and save lives. Through its Fundamental Critical Care Support (FCCS) program, the Society of Critical Care Medicine (SCCM) has provided educational and professional support in settings where help is needed. For the past 10 years, Sujanthy Rajaram, MD, has played an important role, delivering education and support services to underserved populations in her native Sri Lanka.

Now a critical care pulmonologist at Hackensack University Medical Center, Dr. Rajaram completed medical school in Sri Lanka before coming to the United States for her residency. During her university years, she began to recognize a real need for critical care services throughout her home region, a need that intensified following the country's protracted civil war.

"While I was in medical school, I saw and witnessed morbidity and mortality which could have been prevented from simple training and basic interventions," she remembers. "The postwar effects are enormous in this population where healthcare resources are limited, especially in the northern and eastern provinces that were perhaps most affected by 30 years of conflict. Over the past 10 years, I've volun-

teered several times, doing medical mission work and participating in educational efforts to help rebuild the healthcare infrastructure. This experience motivated me to incorporate the FCCS courses as an educational tool in these resource-limited settings."

Making Training Available and Accessible

During the past decade, Dr. Rajaram has done more than teach the FCCS courses — she's also helped develop course materials in obstetrics and adult critical care, and routinely works with SCCM to ensure the materials stay up to date. In Sri Lanka, courses are provided at both the University of Jaffna in the north and the University of Batticaloa in the country's eastern region, two areas particularly affected by the war.

"In Sri Lanka, the healthcare system and infrastructure are there for medical education, but postgraduate training and resources for education are limited," Dr. Rajaram says. "When I went back for teaching and volunteer work, I realized that critical care education is not widely available to house staff or nurses, and particularly for medical officers who work in remote rural areas.

"Improving education can significantly help the population and prevent many deaths, simply by offering basic critical care education for providers, particularly those rural areas," she adds. "I soon realized that giving a full update in critical care basics would help uplift the society in Sri Lanka, particularly when the people we teach are so enthusiastic."

Dr. Rajaram says each time she's returned to present the FCCS courses, the reception has been overwhelmingly positive.

"Course attendees routinely tell me how important the course is and how it helped improve strategies and patient care in their own institutes," she says. "Participants often travel to the classes from other areas of the country,

sometimes traveling significant distances. During our most recent visit in February 2019, we had overwhelming responses at both universities, with about 200 healthcare providers participating overall.

"Several physicians actually came over to ask permission to sit through the course since they were not able to register and really wanted to attend," she adds.

Group Effort

Although funding is awarded by SCCM, FCCS missions rely on volunteers and cosponsors to deliver the courses and achieve educational goals. Locally, Dr. Rajaram and her six-member team were able to secure several important sponsors, including the Jaffna Medical Association, Jaffna Medical Faculty Overseas Alumni, and the Health Ministry.

"We utilized locally available educational tools and charts as additional resources, and I had excellent expert faculty support locally for the skill stations and lectures," she notes. While the February course was offered to physicians and nurses, Dr. Rajaram says the University of Jaffna has requested an annual FCCS course for medical students as well.

Dr. Rajaram says the FCCS course is unique in the way it presents information and in its ability to be adapted to the resources available at each teaching site.

"The FCCS course stands apart from other mission-type educational programs because it gives basic education, training, and experience in critical care in a short period of time, covering many important topics," she says. "Skill stations and the way lectures are structured make the experience more user-friendly and easier to learn. It's truly interactive learning, and it truly makes a difference."

Malathy Varatharajah, MD, director of hospitalist services at Clinton Memorial Hospital in Wilmington, Ohio, and a member of Dr. Rajaram's six-member team, says the FCCS course delivered on its promise to educate local healthcare providers with the aim of improving patient care and outcomes. The Sri Lanka mission was Dr. Varatharajah's first experience with the FCCS program. She says it compares favorably with other volunteer efforts she has experienced.

"I was very impressed with the wide array of topics and skills covered throughout the course," says Dr. Varatharajah. "Local consultants helped with the course lectures and skills stations, while medical officers, nurses, and medical students participated. The course participants gave really positive feedback, indicating that the course was very helpful and informative, and we had several requests for us to repeat the course at least yearly in the future.

"There is no other course similar to the FCCS course currently being conducted in Sri Lanka," she notes. "I think this is an ideal model for that setting and those circumstances to help the nation rebuild and achieve excellent patient care."

COVID-19 Challenge *Continued from page 5*

SCCM has made its position clear in 20 letters sent to Washington in support of a wide range of initiatives to support patients, their families and the clinician members of the ICU team. SCCM provided sign-on support to various organizations, such as the American Medical Association, Infectious Diseases Society of America, Centers for Medicare and Medicaid Services, and Critical Care Societies Collaborative. This show of support included initiatives such as the Heroes Act, which was recently passed by the U.S. House of Representatives.

Developing COVID-19 Education for Critical Care Professionals

SCCM provided a first-hand account from China on the emerging novel coronavirus crisis during its Critical Care Congress in Orlando in February 2020, and it has not stopped producing timely and relevant materials. SCCM quickly launched two webcasts series: one was intended to provide expert presentations to cover the most pressing issues of the day, and the other used a question-and-answer format to address in-the-field concerns. To date, SCCM has developed more than 20 complimentary webcasts viewed by upwards of half a million healthcare professionals.

The Society's COVID-19 Rapid Resource Center has grown to include more than 200 easily searchable resources. In an environment where information is spreading and changing rapidly, this center provides a reliable and trusted source of information. Materials are vetted and peer reviewed, with new items added regularly and originating from SCCM workgroups as well as members of the critical care community at large.

During this crisis, SCCM developed new listening tools to ensure that its resources meet the needs of critical care professionals in the moment. Chatter is monitored on the newly launched COVID-19 discussion board, social media channels, LISTSERVs, SCCM Connect spaces, and Q&A sessions. In addition, journal articles, both in production and published, are reviewed. This information is collated, analyzed, and distributed to those leading SCCM's response efforts to ensure the Society recognizes clinician concerns and is releasing highly relevant materials as they are needed.

SCCM Leaders at the Forefront

In perhaps one of the best examples of how the COVID-19 pandemic has required healthcare to move at the speed of light, the Surviving Sepsis Campaign (SSC) released a COVID-19 critical care guideline in March. Producing guidelines in a normal climate can take years, but this rapid-development cycle helped put important information into the hands of those who needed guidance and positioned SCCM members, once again, as global leaders in the pandemic.

Authors of the SSC guidelines, together with SCCM Council members and past presidents, received personal invitations from Anthony Fauci, MD, to serve on the National Institutes of Health (NIH) panel tasked with developing a national guideline. Released in April, the national guideline included major segments of the SSC guideline.

In addition, the Society's President Elect Greg S. Martin, MD, MSc, FCCM, is among those leading the NIH's Rapid Acceleration of Diagnostics (RADx) initiative in an effort to make millions of accurate and easy-to-use COVID-19 tests available by the end of summer 2020 and making more in time for a possible second wave, which would likely occur in conjunction with influenza season.

Research Initiatives

Discovery, the Critical Care Research Network, in partnership with Mayo Clinic unveiled the first global COVID-19 registry that tracks ICU and hospital care patterns in near-real-time. The Viral Infection and Respiratory Illness Universal Study (VIRUS) registry will reveal practice variations and provide a rich database for research into effective treatments and care. Its rapid creation and SCCM's ability to secure grant funding speak to the success of SCCM's Discovery Network.

Organizing Donations, Grants and Partnerships

To help hospitals impacted by severe supply and equipment shortages, SCCM worked with other nonprofit organizations and corporations to offer support. For example, SCCM quickly identified New York City Health + Hospitals, and Avera McKennan Hospital and University Health Center both in South Dakota, as hospital systems with severe needs and partnered with Direct Relief to

send ICU medication kits to these systems. The kits included more than 86,000 units of essential pharmaceuticals. Additionally, more than 100 oxygen concentrators were also shipped to these systems to aid in post-acute treatments.

SCCM also partnered with several companies that generously offered no-cost or significantly discounted rates at various airlines, hotels, car rentals and restaurants to support clinicians.

Many of the Society's efforts discussed here would not have been possible without generous funding from organizations like the Schmidt Family Foundation, the Gordon and Betty More Foundation, the CDC Foundation and others who share SCCM's values. In addition, members of the profession and public donated to support the response effort. For all of this generosity, we are extremely thankful.

Industry Support

To date, SCCM has received more than \$700,000 from industry in support of our COVID-19 response efforts. These funds are being used to provide online educational content, virtual webinars and other resources for ICU and non-ICU clinicians alike. Thanks to all our industry supporters:

- Abbott Nutrition
- Baxter Nutrition
- Draeger
- Edwards Life Sciences
- Fresenius-Kabi
- Genetech
- Masimo
- Mylan
- Nestle Health Science
- Novartis
- Pfizer
- Thermo Fisher Scientific

Looking into the Future

The future is uncertain in the COVID-19 era, but SCCM is steadfast in its mission to improve care of the critically ill and injured. "While we aren't sure what lies ahead, I am reassured by the way the entirety of SCCM stepped forward to respond to the pandemic" said SCCM CEO David Martin, CAE, chief executive officer and executive vice-president of the Society. "With ICU professionals united across the globe, we will not only save lives during this outbreak, we will be better than we were, with new knowledge, skills, technologies, behaviors, and systems that lead to improved patient outcomes long-after the pandemic subsides."

Advanced Practitioners and Critical Care for Medicare Patients



THE CENTERS FOR MEDICARE AND MEDICAID SERVICES (CMS) DEFINES THE ADVANCED PRACTITIONER (APP) AS A:

- Nurse Practitioner (NP)
- Physician Assistant (PA)
- Clinical Nurse Specialist (CNS)

These APPs may perform services within their state scope of practice and their facility-imposed guidelines. In general, they may:

- Perform evaluation and management services, including critical care
- Assist in surgery
- Perform bedside procedures
- Perform other services within their scope of practice according to state laws and regulations

APPs must meet the collaboration, physician supervision, and billing requirements; additionally, PAs must meet the general physician supervision requirements. APPs must be employed by the same entity as the physician to bill jointly with that physician.

If the APP is a hospital-employed practitioner and is included on the Medicare cost report, the APP cannot bill for critical care services because those services are included in the hospital billing. If the APP is excluded from the hospital Medicare cost report, he/she can bill professional services, including critical care, using the

individual's National Provider Identification (NPI) number. If the APP is employed by the hospital, payment should be reassigned to the hospital. In this instance, the employer (hospital) bills the APP's professional services under Medicare Part B using the APP's NPI number.

If the APP is employed by the hospital and leased to the physician group, services are

billed under the physician practice, according to the contractual arrangement the practice has with the hospital or APP.

The split/shared rule applies in the inpatient hospital setting for the initial and subsequent hospital care, but not for critical care services performed by the APP. Critical care must be billed under the APP's NPI number. This includes critical care services, bedside procedures in critical care, and any other services not bundled into the critical care code. The APP's and physician's time cannot be combined to calculate the primary adult critical care code (current procedural terminology [CPT] code 99291). According to CMS, the initial critical care time (code 99291) must be met by a single physician or qualified APP.

If the physician performs the first 60 minutes, but does not meet the 74-minute threshold, and the PA who works in the same group or specialty manages the patient later in the day for 30 minutes, how should the encounter be reported? If the physician performs the initial critical care service, he/she would report using code 99291 for the initial encounter, and the PA would report using code 99292 under his/her NPI number for managing the critical care patient later in the day.



Deborah Grider, CPC, COC, CPC-I, CPC-P, CPMA, CEMC, CCS-P, CDIP, is a senior consultant with KarenZupko & Associates, Inc., an organization that works nationally with physician practices on coding, revenue cycle, and other practice management issues.

- Physician: 99291 (30 minutes of critical care time)
- PA: 99292 (30 minutes of critical care time)
Because the PA and physician cannot split/share the visit, each would report critical care.

Example 1

The NP is called urgently to the surgical intensive care unit for a patient receiving extracorporeal membrane oxygenation who is in respiratory distress. The NP provides 70 minutes of critical care to stabilize the patient.

The physician arrives, examines the patient, reviews the findings, and spends an additional 30 minutes providing full attention to the critical patient.

How would this be reported?

The initial encounter would be reported with CPT code 99291 under the APP's name and NPI number, and the physician would bill code 99292 for each additional 30 minutes.

Example 2

The cardiologist is managing a myocardial infarction patient in the critical care unit

who is worsening. The physician spends 60 minutes managing the patient. Later in the day, the cardiology APP provides critical care to the same patient for 40 minutes.

- Physician: 99291
- APP: 99292

According to the CMS Manual, "Physicians in the same group practice who have the same specialty may not each report CPT initial critical care code 99291 for critical care services to the same patient on the same calendar date. Medicare payment policy states that physicians in the same group practice who are in the same specialty must bill and be paid as though each were the single physician. (Refer to the Medicare Claims Processing Manual, Pub. 100-04, Chapter 12, §30.6.)"

Physician specialty denotes the self-designated primary specialty by which the physician bills Medicare and is known to the A/B Medicare Administrative Contractor (B) who adjudicates the claims.

If physicians or qualified nonphysician practitioners (NPP) within a group provide "staff coverage" or "follow-up" for each other

after the first hour of critical care services provided on the same calendar date by the previous group clinician (physician or qualified NPP), the subsequent visits by the "covering" physician or qualified NPP in the group should be billed using CPT critical care add-on code 99292. The appropriate individual NPI number is reported on the claim. The services will be paid at the specific physician fee schedule rate for the individual clinician (physician or qualified NPP) billing the service.

Keep in mind that some Medicare contractors are instructing the APPs to also report code 99291 for their initial encounter with the patient, since the APPs do not share the same taxonomy code with the physician. Before billing for an APP's service, check with the individual Medicare contractor to see if the contractor rules differ from those of CMS.

Also recommended is a check with the commercial payors regarding the billing regulations for APPs in critical care. Keep in mind that many of Medicare contractors have specific guidelines for billing critical care services.

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Pediatric Septic Shock and Requests for Potentially Inappropriate Treatments

Case:

Marcus is a 19-month-old male infant with hypereosinophilia due to hemophagocytic lymphohistiocytosis after unrelated-donor allogeneic stem cell transplant. Before the transplant, Marcus's course was complicated by diffuse cerebral ischemic infarcts, bronchiolitis, necrotizing pneumonia, *Clostridium difficile* colitis, Epstein-Barr viremia, and disseminated *Candida* infection.

Following the transplant, Marcus's course was complicated by systemic adenovirus and Epstein-Barr virus infections, as well as brain and renal abscesses likely caused by *Aspergillus*. On day 4 following the stem cell transplant, Marcus was transferred to the pediatric intensive care unit (PICU) for care of acute respiratory failure due to veno-occlusive disease. During his PICU admission, Marcus required support with high-frequency oscillatory ventilation, placement of multiple chest tubes for hemothoraces, vasopressor support, peritoneal drain placement for management of ascites, and continuous renal replacement therapy. After weeks in the PICU, he developed sustained capillary leakage, leading to hypotension requiring support with multiple vasopressors and precluding fluid removal with renal replacement therapy. His mental status -- difficult to evaluate at baseline, as he was likely

blind and deaf from previous cerebrovascular accidents and infection -- decompensated to the point that he was inconsolable, despite a robust regimen of sedation and medications to treat delirium.

The attending physician is concerned that Marcus is suffering and that ongoing interventions are not beneficial. Marcus's parents, who are Spanish speakers and have limited family and social support, became angry with the physician because they believe that Marcus simply needs more time for his stem cell transplant and the antibiotics to work. The parents believe that the medical team is "giving up" on Marcus, and they do not understand why the PICU is suggesting withdrawal of life support, given that Marcus has been sick for so long,

Analysis:

This case is tragic. Clearly, the parents and healthcare team have been working for a long time to give Marcus the best chance possible for recovery. His parents hope that Marcus will heal and come home. His doctor, and likely other members of the team, believe that Marcus will not survive and that they are merely prolonging his suffering. Sadly, this case is not unusual.

With the rise of bioethics in the 1970s, patients became empowered to determine their

...clinicians should not offer or provide futile interventions (ie, those that provide no physiologic benefit), and that family requests for interventions that the intensive care unit (ICU) professionals believe are inappropriate (because they are of limited benefit) can be denied in ethically supportable ways.

own treatment. By the mid-1990s, there was a broad belief that patients and their families could not only refuse recommended treatment, but could also demand interventions not recommended by the care provider. In 1997, the Society of Critical Care Medicine Ethics Committee published a statement advising that clinicians should not offer or provide futile interventions (ie, those that provide no physiologic benefit), and that family requests for interventions that the intensive care unit (ICU) professionals believe are inappropriate (because they are of limited benefit) can be denied in ethically supportable ways.¹

The Society issued a statement in 2016 clarifying that “ICU interventions should generally be considered inappropriate when there is no reasonable expectation that the patient will improve sufficiently to survive outside the acute care setting, or when there is no reasonable expectation that the patient’s neurologic function will improve sufficiently to allow the patient to perceive the benefits of treatment.”² In the case outlined, not only do the PICU professionals believe that Marcus will never leave the hospital, they believe that he is suffering. Often, PICU staff may feel that they are causing suffering even if a patient appears unable to feel pain or discomfort (eg, a child in persistent vegetative state). In such cases, it can be comforting to staff to help them consider the inconsistencies in their thoughts and statements, and to understand that although life-prolonging interventions might seem inappropriate, the child is not experiencing suffering. In Marcus’ case, however, the child does appear to be suffering. When staff are forced to perform acts that they believe cause suffering, they may experience moral distress. Team members who repeatedly feel powerless to do what they believe is right are at high-risk for job dissatisfaction and burnout.

On the other hand, families may perceive the patient care very differently than ICU

staff. For example, differences in perception of time may be significant between parents and healthcare professionals. A 2-week stay may be viewed by staff as a long time and, lacking a reasonable expectation of improvement, staff is often ready to limit or withdraw life-prolonging interventions after only a few days. On the other hand, parents generally perceive that time period very differently. When a previously healthy child becomes ill or injured, moving to limit or withdraw interventions after only 2 weeks often feels very fast. In such cases, it is helpful to ask staff: “If your child was hit by a car and was in the PICU, and care providers started talking about withdrawing life-prolonging interventions, how would you feel?” Helping staff empathize with parents can be powerful. In the case presented, the parents may need more time and clear communication to understand the timing of engraftment and Marcus’s overall prognosis.

In cases like this, the first step is to redouble efforts at communication. Listening to parents, doctors, nurses, and others, and empathizing with them, can help them feel heard and cared for. Active listening skills can make an important difference. Ask the individual to tell what is happening. As the person talks, simply listen. Usually, the talk is about how the person feels; if this is not offered, specifically ask, “How do you feel about that?”

Do not interrupt; simply let people talk as long as they want. Make sure you understood, saying, “What I think you said was Is that right?” Once you are certain you fully understand, offer an empathetic response: “Yes, that makes a lot of sense. If my daughter was in a car accident and I felt that the doctor was giving up on her because we are poor, I would be very distrustful and angry” (which is true). Do not question the validity of their perceptions or feelings, because those are *their perceptions* and *their feelings*. Once their feelings have been validated, people are often ready to have a meaningful dialogue.

Negotiating between the parents and the team requires compromise on both sides. A qualified, trained, certified healthcare ethics consultant can be extremely helpful. To help facilities and clinicians determine who is qualified to perform ethics consultations, and to improve the overall quality of those consultations, the American Society for Bioethics and Humanities developed a certification program. Qualified individuals can obtain the Healthcare Ethics Consultant-Certified (HEC-C) certification, and clinicians can seek the assistance of those individuals to better serve families and staff.

When all of these efforts fail to produce an acceptable compromise solution, there may be no alternative but to consider unilateral withdrawal of life-prolonging interventions. The Society, along with four other critical care organizations, published a policy statement on responding to requests for potentially inappropriate treatments in the ICU. The statement outlined a seven-step process that can be integrated into an institution’s policy.³

Clinicians should not embark on the recommended process without the support of hospital administration and a formal policy. Clinicians should also remember that patients of minority status, low socioeconomic status, and low health literacy are at risk for receiving disparate care. Institutions should have a standard policy that is applied uniformly to all cases, and any such policy should include a provision to periodically review all cases to ensure fair treatment for all patients and families.



Jessica Turnbull, MD, MA, trained at Seattle Children’s Hospital and the Treuman Katz Center for Pediatric Bioethics. She joined the faculty at Monroe Carell Jr. Children’s Hospital at Vanderbilt and Vanderbilt University Medical Center’s Center for Biomedical Ethics and Society in 2013.



Alexander A. Kon, MD, HEC-C, FAAP, FCCM, is a pediatric intensivist and bioethicist who has served as president of the American Society for Bioethics and Humanities and as chair of the Society of Critical Care Medicine Ethics Committee. He is a certified healthcare ethics consultant with over 20 years of experience in ethics consultation and pediatric critical care. He has published more than 100 journal articles and book chapters on decision-making, ethics consultation, futility, and other ethics topics.

Section and Chapter News

THE SOCIETY OF CRITICAL CARE MEDICINE (SCCM) has 15 specialty sections to accommodate members of different professions and disciplines. Members may join up to three sections for unique opportunities to network with colleagues and become more involved in projects and initiatives while advancing SCCM's mission. For more information on joining a specialty section, visit sccm.org/membership.

Anesthesiology Section

The Anesthesiology Section had a very productive 2019. The new organizational structure of the section and its subcommittees has led to an increase in membership engagement and participation at the 49th Critical Care Congress.

The Program Planning Subcommittee, under the leadership of Robert D. Stevens, MD, PhD, FCCM, created anesthesiology-specific panels and educational offerings for Congress. The Year in Review: Anesthesiology lecture was especially well received. Jose L. Diaz-Gomez, MD, FASE, FCCM, led and coordinated the first Society of Critical Care Medicine (SCCM) Critical Care Ultrasound course in Spanish. Ashish K. Khanna, MD, FCCP, FCCM, and Michael H. Wall, MD, FCCM, facilitated the section's quiz show team and cross-talk sessions. The Women in Critical Care Medicine Knowledge and Education Group (KEG), whose steering committee includes many section members (Talia K. Ben-Jacob, MD, MS; Jarva Chow, MD, MPH, MS; Margit Kaufman, MD; and Navneet Grewal, MD), ran a successful business meeting and created many mentoring relationships in their first social networking event.

The annual section reception, chaired by Drs. Diaz-Gomez and Ben-Jacob, was well attended and included a tribute to Brian P. Kavanagh, MD, an internationally renowned anesthesiology intensivist and scientist who died in June 2019. To honor his memory over the next 5 years, the Anesthesiology Section will name a travel grant award after him. The recipients of this year's travel grant awards were Daniel E. Leisman and Michael E. Kiyatkin, MD, MS.

Neal H. Cohen, MD, MPH, MS, FCCM, received the Burchardi Award at Congress. This award, which is cosponsored by SCCM and the Society of Critical Care Anesthesiologists, is presented to an anesthesia-based intensivist who has made considerable contributions to the specialty in the areas of leadership and the ability to motivate and connect with people.

All section subcommittees met during Congress and created goals and objectives to guide programming and initiatives for the 50th Critical Care Congress in 2021. Section members who would like to get involved or join a subcommittee can contact the section steering committee or section subcommittee coauthors through SCCM Connect.

Clinical Pharmacy and Pharmacology Section
Check out the December Clinical Pharmacy and Pharmacology (CPP) Section Newsletter, which highlights members' involvement in this year's Congress. Contact Calvin E. Tucker, BCCCP, BCPS, MBA (pharmdcet@gmail.com) or Mona K. Patel, BCCCP, PharmD

Clinical Pharmacy and Pharmacology Section

(mop9020@nyp.org) for more information.

Education
CPP Journal Club continues to be held monthly. Mini-interviews are posted on SCCM Connect. The course, Advanced Pharmacotherapy in Critical Care, was held before Congress. Follow us on Twitter via @PharmacyCCed and #PharmCritChats. Contact Drayton A. Hammond, BCCCP, MBA, MS (drayton.hammond@gmail.com) or Mojdeh S. Heavner, BC-CCP, BCPS, PharmD (mheavner@rx.umaryland.edu) for more information.

Education

Membership
The Mentor-Mentee Program provides CPP Section members with guidance in many areas. The Congress Buddy Program is also available for first-time Congress attendees. The Mentorship Program Toolkit is posted on SCCM Connect. Contact Paul O'Donnell, BCCCP, BCPS, PharmD (podonn@midwestern.edu) or Meagan Latham, BCCCP, BCPS, PharmD (Meagan.Latham@franciscanalliance.org) for more information.

Membership

Research
Visit the Research Forum (<https://cpresearchforum.jcink.net/>) for quarterly Ask Me Anything events with content experts, grant funding databases, and potential collaborative research discussions. Manuscript and grant review

Research

services are also available. View monthly CCP Literature Updates on SCCM Connect. Contact Adrian Wong, BCCCP, MPH, PharmD (adrian.wong@mcphs.edu) or Alexander H. Flannery, BCCCP, BCPS, PharmD (alex.flannery@uky.edu) for more information.

Patient Safety
The November edition of the Patient Safety Update Newsletter is posted on SCCM Connect. It summarizes literature and safety alerts pertinent to critical care providers. Contact Brian J. Kopp, BCCCP, BCPS, PharmD (Brian.Kopp@bannerhealth.com) or Earnest Alexander, Jr, PharmD, FCCM (ealexander@tgh.org) for more information.

Patient Safety

Program
CPP Section events at Congress included the Pre-Congress forum, Burnout Among ICU Clinicians; new member orientation; a member reception; the Recruitment Exchange; and Year in Review: Pharmacy. Additional programming included the SCCM Quiz Show, critical care cross talks, and roundtable discussions. Contact Andrea Nei, BCCCP, BCPS, PharmD (nei.andrea@mayo.edu) or Chris Carter, PharmD, BCCCP (Christopher.Carter@ssmhealth.com) for more information.

Program

Practice Advancement
Results of the practice-based survey on ICU pharmacy services were presented at Congress. The

Practice Advancement

committee is also working with the Research Committee on a pharmacist-to-patient ratio/pharmacist burnout time-motion study. Contact Russel J. Roberts, BC-CCP, BCPS, PharmD (rjroberts@mgh.harvard.edu) or Mitchell S. Buckley, BCCCP, PharmD, FCCP (Mitchell.buckley@bannerhealth.com) for more information.

Neuroscience Section

The Neuroscience Section had another amazing year. Section member David K. Menon, MD, PhD, FFICM, the recipient of the American College of Critical Care Medicine (ACCM) Distinguished Investigator Award, was honored with a reception during the section's annual business meeting at Congress.

The Year in Review: Neurology session, with the all-new, reverse-classroom-style format that engaged the audience, was very well attended. Presentations included an update on the National Board of Medical Examiners' process for board certification by Lori A. Shutter, MD, FNCS, FCCM; a review of recent clinical trials by Karen G. Hirsch, MD; and a stimulating discussion on the code "Found Down," led by John V. Agapian, MD, MS, FACS, FCCM.

The travel grant recipient was Katherine Doane for her abstract, Neurocognitive Outcomes and Mortality on Pediatric ECMO Are Proportional to Bleeding Severity. The section also hosted another cross-talk session.

The section is one of the largest and continues to grow. To better serve the needs of section members, four subcommittees have been introduced: 1) Media, 2) Program Planning, 3) Research Section Liaison, and 4) Trauma/Neurosurgery. Plans are in the

works to add more subcommittees, and section members are invited to submit proposals for any subcommittees they may be interested in helping to launch.

Finally, Dr. Shutter was inaugurated as the new section chair during Congress, as Dr. Agapian moves on to the role of past chair/nominating committee chair. Fred Rincon, MD, MS, FCCM, was recognized with a gift of appreciation for his 6-year tenure on the steering committee and as past chair.

Pediatrics Section

It was great to see so many section members at Congress in Orlando. The Pediatrics Section celebrated another outstanding Congress with a wide range of pediatric content.

The section had numerous award winners among its members, including ACCM inductees, Presidential Citation recipients, and an ICU Design Citation Award winner, to name a few.

Many in-person mentorship meetings were held at Congress as part of the newly created GUARDIAN mentorship program. In its first year, the GUARDIAN program matched 85 pairs of mentors and mentees (a total of 170 participants) across the spectrum of age and seniority, location of training and practice, and the full spectrum of career paths. The program is flexible in meeting the needs of both mentor and mentee, and features four separate GUARDIAN "Meeting Weeks" over the course of the academic year to facilitate communication. The second occurred during Congress and allowed mentors and mentees to meet in person. This program was a major highlight of the section business meeting, which also featured the outstanding work by

the committee and subcommittee chairs.

At the conclusion of Congress, section leadership was transitioned from David A. Turner, MD, FCCM, to the new chair, Alexandre T. Rotta, MD, FCCM, from Duke University Medical Center, and new chair-elect Mark W. Hall, MD, FCCM, from Nationwide Children's Hospital.

Another productive year is anticipated for the section.

Research Section

Thanks to Andrew A. Kramer, PhD, FCCM, who served as chair of the Clinical Research and Epidemiology (CRE) Committee through this past Congress. Thanks also to Scott Bolesta, PharmD, BCPS, FCCM, section chair, who got the year off to a tremendous start by identifying several dozen members of the Research Section who were interested in joining the CRE Committee. Finally, thanks to Somnath Bose, MD, MBBS, for serving as secretary and Norma M. Smalls-Mantey, MBA, MD, FACS, FCCM, for serving as member-at-large.

The section held its first meeting at the 2019 Congress in San Diego and has had five web/phone meetings in the months since. A total of 70 people participated in these meetings, which represents an exciting amount of growth and enthusiasm.

The section published the results of the research needs survey, which reflected input from 130 section members. Much effort this year focused on identifying new roles for the CRE Committee to take on; ideas included producing online educational materials, creating de-identified ICU data sets, identifying official research priorities for the section, develop-

ing an ICU census, and helping to create standard data elements for ICU research. A needs assessment poll is planned to solicit guidance from the members about how to best serve their interests. New members are always welcome.

Respiratory Care Section

Thank you to all section members and the steering committee for participating in section projects in 2019. The section hopes that energy is carried into 2020, and this is an invitation to participate in work groups as members continue to build an effective section. SCCM sections are dependent on, and appreciate, volunteers and their work.

Natalie Napolitano, MPH, RRT-NPS, FAARC, leads the research work group and has helped the section participate in the Research Mentor/Mentee Program supported by the Research Section. The Communications Committee, led by pulmonologist Herbert Patrick, MD, MSEE, FCCM, continues to submit clinical articles for publication and strives to publish information in *Critical Connections*. Sujanthi S. Rajaram, MD, MPH, FCCP, leads the work group for Congress proposals. Andrew Miller, RRT, RRT-ACCS, RRT-NPS (@AGMRRT) leads the quarterly journal club on Twitter.

Thank you again to all section members. The section looks forward to a great 2020.

Northeast Chapter

The Northeast Chapter of the Society of Critical Care Medicine (SCCM) continues to serve New York, Connecticut, Massachusetts, New Hampshire, Maine, Rhode Island, and Vermont, while promoting educational benefits and services to our communities.

Section and Chapter News

The chapter and its members provide ongoing education throughout the region. This past September, the 5th Annual Point-of-Care Ultrasound course, held in Hartford, Connecticut, was a huge success. It sold out again, as it has each year. Participants came from seven hospitals across six states. The Northeast Chapter would like to thank the course directors, Peter S. Sandor, PA-C, FCCM, and Ash Seth, PA-C, FCCM, who continue to make this course successful every year. We also want to thank Guy Aristide, MD, and his team from New York who led the course lectures and provided ultrasound guidance. The course was also fortunate to have Prashant Grover, MD, from Hartford, Connecticut, to teach ultrasound techniques. Course support was provided by Northeast Chapter President-Elect Scott May, PharmD, BCPS, BCCCP, and Northeast Chapter President James E. Lunn, PA-C, FCCM.

In November, Northeast Chapter members, led by Robert C. Gibson, ACNP, and his team, hosted the 2nd Annual Western New York Critical Care Symposium in Buffalo, New York. The two-day symposium was a great success and was supported by our chapter. Fraser Mackay, MD, represented our chapter as one of the key speakers. Great job, everyone! We look forward to next year.

Chapter members' various outreach activities have helped to spread information and awareness of SCCM. Chapter members are encouraged to use SCCM Connect to communicate with members throughout the region.

If you are not a current member and are interested in joining our

Northeast Chapter, you can learn more at sccm.org/Chapters. If you are interested in learning more about our chapter, please contact us at sccmne@gmail.com or follow us on Facebook.

Southeast Chapter

The Southeast Chapter of SCCM serves Alabama, Arkansas, Louisiana, Georgia, Kentucky, Mississippi, and Tennessee and continues to promote the highest quality of care for critically ill patients. We are proud to announce that the Southeast Chapter had a successful turnout at its business meeting at SCCM's annual Congress in Orlando, Florida, in February. At our quarterly meeting in March, Michael J. Connor Jr, MD, from Emory University and Grady Memorial Hospital in Atlanta, Georgia, discussed continuous renal replacement therapy. The chapter continues to offer various educational opportunities for members such as ultrasound courses, Fundamental Critical Care Support courses, bite-sized lecture series, and Twitter journal clubs multiple times each year. For more information or to sign up for these events, visit our website at www.sccmse.org. If you reside in the chapter region and are interested in hearing more about our events and how to get involved, follow us on Facebook, on Twitter @SCCMSE, or visit our website at sccmse.org.

Carolinas/Virginias Chapter

The Carolinas/Virginias Chapter of SCCM serves nearly 400 members across North and South Carolina, Virginia, and West Virginia to foster collaboration regionally to enhance patient care. Benefits include the Annual

Scientific Symposium, leadership and professional development opportunities, collaborative research projects, outreach, and networking. The 38th Annual Scientific Symposium and Pharmacology Pre-Conference will be held June 4-5, 2020, in Asheville, North Carolina. Additional continuing education and a networking session will be available after the pre-conference. The keynote speaker will be SCCM President Lewis J. Kaplan, MD, FACS, FCCM, FCCP.

The annual Leadership Retreat was held on November 1, 2019, in Raleigh, North Carolina. The board of directors and committee chairs met to discuss membership engagement. We have many new and fresh ideas that we will be rolling out in the spring, the first of these being a chapter website. Stay tuned for details!

Several committees provide opportunities for involvement:

- **Communications:** Provides updates via email, quarterly newsletters, and social media
- **Education:** Organizes and plans the Annual Scientific Symposium and Pharmacology Pre-Conference
- **Membership:** Focuses on member recruitment and retention
- **Mentorship:** Supports and facilitates chapter members' professional development
- **Nominations:** Solicits nominations annually for the board of directors
- **Outreach:** Provides opportunities for service and education locally, regionally, and globally
- **Research:** Promotes collaborative research opportunities across the region

Please visit our new website

at cvcscm.org, contact us at cvcscm@gmail.com, and follow us on the SCCM Carolinas/Virginias Chapter Facebook page and Twitter @CVCSCCM if you are interested in learning more, joining our chapter, or volunteering for a committee.

Texas Chapter

The Texas Chapter serves over 700 members across Texas including Houston, San Antonio, Dallas, El Paso, and Austin, where we host monthly educational dinner meetings and lunch-and-learns.

Most recently, we expanded our simulcast meetings to a lunch-and-learn including all five cities across Texas and ended the holiday season with socials in each city in conjunction with a community engagement event. The Houston region was able to aid in efforts to replenish the Houston Food Bank food supply after 1.8 million pounds of food were spoiled by an ammonia leak. We hope to continue our efforts this year to support our community through education and philanthropy.

The chapter hosted its meeting and reception at the Annual Congress in Orlando in February. We announced and welcomed our newly elected executive committee and board of directors for the year.

The Texas Chapter continues to be committed to providing education and promoting the high-quality work being done by our members. If you are not a current member but would like to know more about our chapter and member benefits, please visit our website at sccmtexaschapter.org and join us on social media: Twitter, Instagram, or Facebook!

SMOFLIPID (lipid injectable emulsion), for intravenous use

BRIEF SUMMARY OF PRESCRIBING INFORMATION

This brief summary does not include all the information needed to use Smoflipid safely and effectively. Please see full prescribing information, including Boxed Warning for Smoflipid (lipid injectable emulsion), for intravenous use at www.smoflipid.com.

WARNING: DEATH IN PRETERM INFANTS

- Deaths in preterm infants after infusion of intravenous lipid emulsions have been reported in the medical literature.
- Autopsy findings included intravascular fat accumulation in the lungs.
- Preterm infants and low-birth-weight infants have poor clearance of intravenous lipid emulsion and increased free fatty acid plasma levels following lipid emulsion infusion.

INDICATIONS AND USAGE

Smoflipid is indicated in adults as a source of calories and essential fatty acids for parenteral nutrition (PN) when oral or enteral nutrition is not possible, insufficient, or contraindicated.

Limitations of Use:

The omega-6: omega-3 fatty acid ratio and Medium Chain Triglycerides in Smoflipid have not been shown to improve clinical outcomes compared to other intravenous lipid emulsions.

DOSAGE AND ADMINISTRATION

The recommended daily dosage in adults is 1 to 2 grams/kg per day and should not exceed 2.5 grams/kg per day. Smoflipid 1000 mL is supplied as a Pharmacy Bulk Package for admixing only and is not for direct infusion. Prior to administration, transfer to a separate PN container.

CONTRAINDICATIONS

Known hypersensitivity to fish, egg, soybean, or peanut protein, or to any of the active ingredients or excipients.

Severe hyperlipidemia or severe disorders of lipid metabolism with serum triglycerides > 1,000 mg/dL.

WARNINGS AND PRECAUTIONS

- Death in Preterm Infants: (see BLACK BOX WARNING)
- Hypersensitivity Reactions: Smoflipid contains soybean oil, fish oil, and egg phospholipids, which may cause hypersensitivity reactions. Cross reactions have been observed between soybean and peanut oil. Signs or symptoms of a hypersensitivity reaction may include: tachypnea, dyspnea, hypoxia, bronchospasm, tachycardia, hypotension, cyanosis, vomiting, nausea, headache, sweating, dizziness, altered mentation, flushing, rash, urticaria, erythema, pyrexia, or chills. If a hypersensitivity reaction occurs, stop infusion of Smoflipid immediately and undertake appropriate treatment and supportive measures.
- Risk of Catheter-Related Infections: Lipid emulsions, such as Smoflipid, can support microbial growth and is an independent risk factor for the development of catheter-related bloodstream infections. The risk of infection is increased in patients with malnutrition-associated immunosuppression, long-term use and poor maintenance of intravenous catheters, or immunosuppressive effects of other concomitant conditions or drugs.
- Fat Overload Syndrome: This is a rare condition that has been reported with intravenous lipid emulsions. A reduced or limited ability to metabolize lipids accompanied by prolonged plasma clearance may result in a syndrome characterized by a sudden deterioration in the patient's condition including fever, anemia, leukopenia, thrombocytopenia, coagulation disorders, hyperlipidemia, fatty liver infiltration (hepatomegaly), deteriorating liver function, and central nervous system manifestations (e.g., coma).
- Refeeding Syndrome: Reintroducing calories and protein to severely undernourished patients with PN may result in the refeeding syndrome, characterized by the intracellular shift of potassium, phosphorus, and magnesium as the patient becomes anabolic. Thiamine deficiency and fluid retention may also develop.
- Aluminum Toxicity: Smoflipid contains no more than 25 mcg/L of aluminum. During prolonged PN administration in patients with renal impairment, the aluminum levels in the patient may reach toxic levels. Preterm infants are at greater risk because their kidneys are immature, and they require large amounts

of calcium and phosphate solutions, which contain aluminum. Patients with renal impairment, including preterm infants, who receive parenteral intakes of aluminum at greater than 4 to 5 mcg/kg/day can accumulate aluminum to levels associated with central nervous system and bone toxicity. Tissue loading may occur at even lower rates of administration of PN products.

- Risk of Parenteral Nutrition-Associated Liver Disease (PNALD): PNALD has been reported in patients who receive PN for extended periods of time, especially preterm infants, and can present as cholestasis or steatohepatitis. The exact etiology is unknown and is likely multifactorial. Intravenously administered phytosterols (plant sterols) contained in plant-derived lipid formulations have been associated with development of PNALD, although a causal relationship has not been established. If Smoflipid-treated patients develop liver test abnormalities, consider discontinuation or dose reduction.
- Hypertriglyceridemia: Impaired lipid metabolism with hypertriglyceridemia may occur in conditions such as inherited lipid disorders, obesity, diabetes mellitus, and metabolic syndrome.
- Monitoring/Laboratory Tests: Routinely monitor serum triglycerides, fluid and electrolyte status, blood glucose, liver and kidney function, blood count including platelets, and coagulation parameters throughout treatment. Monitoring patients for signs and symptoms of essential fatty acid deficiency (EFAD) is recommended.
- Interference with Laboratory Tests: Content of vitamin K may counteract anticoagulant activity. The lipids contained in this emulsion may interfere with some laboratory blood tests (e.g., hemoglobin, lactate dehydrogenase [LDH], bilirubin, and oxygen saturation) if blood is sampled before lipids have cleared from the bloodstream.

ADVERSE REACTIONS

Most common adverse drug reactions >1% of patients who received Smoflipid from clinical trials were nausea, vomiting, hyperglycemia, flatulence, pyrexia, abdominal pain, increased blood triglycerides, hypertension, sepsis, dyspepsia, urinary tract infection, anemia and device-related infection.

Less common adverse reactions in ≤ 1% of patients who received Smoflipid were dyspnea, leukocytosis, diarrhea, pneumonia, cholestasis, dysgeusia, increased blood alkaline phosphatase, increased gamma-glutamyltransferase, increased C-reactive protein, tachycardia, liver function test abnormalities, headache, pruritis, dizziness, rash and thrombophlebitis.

The following adverse reactions have been identified during post-approval use of Smoflipid in countries where it is registered. Infections and Infestations: infection. Respiratory, Thoracic and Mediastinal Disorders: dyspnea.

To report SUSPECTED ADVERSE REACTIONS, contact Fresenius Kabi USA, LLC, at 1-800-551-7176, option 5, or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

DRUG INTERACTIONS

Coumarin and Coumarin Derivatives, Including Warfarin: Anticoagulant activity may be counteracted; monitor laboratory parameters.

USE IN SPECIFIC POPULATIONS

- Pregnancy and Lactation: There are no available data on risks associated with SMOFLIPID when used in pregnant or lactating women.
- Pediatric Use: The safety and effectiveness of Smoflipid have not been established in pediatric patients.
- Hepatic Impairment: Parenteral nutrition should be used with caution in patients with hepatic impairment. Hepatobiliary disorders are known to develop in some patients without preexisting liver disease who receive PN, including cholestasis, hepatic steatosis, fibrosis and cirrhosis (PN associated liver disease), possibly leading to hepatic failure.

OVERDOSE

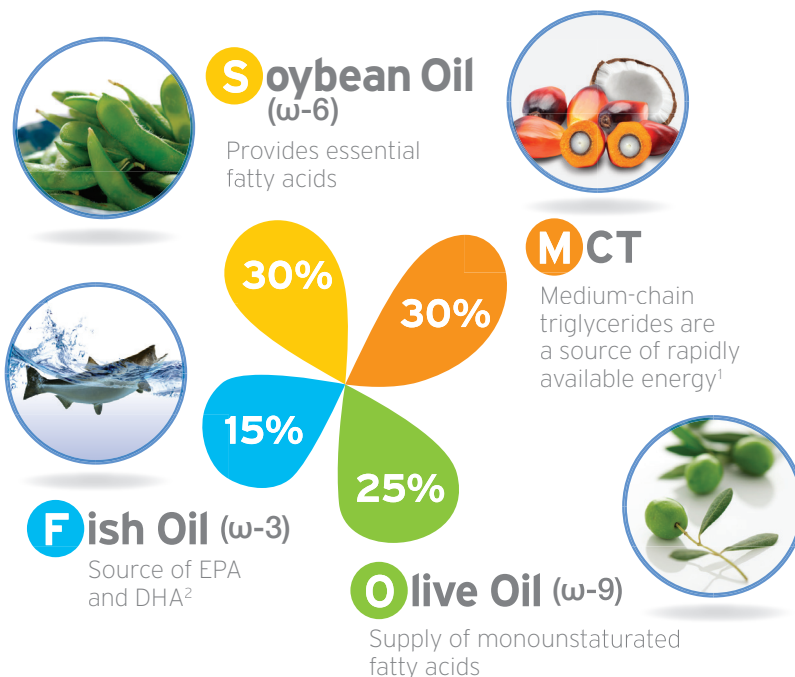
In the event of an overdose, fat overload syndrome may occur. Stop the Smoflipid infusion until triglyceride levels have normalized. The effects are usually reversible by stopping the lipid infusion. If medically appropriate, further intervention may be indicated. Lipids are not dialyzable from serum.

REFERENCES: 1. Deckelbaum RJ, et al. Medium-chain versus long-chain triacylglycerol emulsion hydrolysis by lipoprotein lipase and hepatic lipase: implications for the mechanisms of lipase action. *Biochemistry (Mosc)*. 1990;29(5):1136-1142. 2. Kalish BT, Fallon EM, Puder M. *JPEN J Parenter Enteral Nutr*. 2012;36:380-8.

SMOFlipid®

Lipid Injectable Emulsion, USP 20%

The **FIRST and only** four oil lipid emulsion in the U.S., SMOFlipid is a unique blend of four oil sources:



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