

## Preface



Mark D. Siegel, MD  
*Guest Editor*

In the developed world, routine ICU monitoring includes daily chest radiographs, laboratory tests, continuous telemetry and oxymetry, real-time hemodynamic and respiratory measurements, and on-demand CT and echocardiography. The relationship between close monitoring and better outcomes is, perhaps surprisingly, taken as a matter of faith. Careful surveillance may reveal unsuspected abnormalities that lead to timely therapy. Alternatively, monitoring may ensure that interventions achieve desired goals. Monitoring is a key component of several treatments that improve survival, such as low tidal volume ventilation and early goal-directed therapy for ARDS and sepsis, respectively [1–4].

Monitoring is not universally beneficial, however. It can potentially be useless or harmful, particularly if the resulting therapy is ineffective. Sometimes insufficient skills preclude benefit [5]. More often, an ill-considered instinct to correct physiologic or laboratory abnormalities can be harmful. In the past, before permissive hypercapnia was routine, intensivists undoubtedly contributed to the deaths of many intubated asthmatics while attempting to correct respiratory acidosis [6]. More recently, mounting evidence suggests harm when low transfusion triggers are used for anemia [7,8]. In dramatic fashion, Swan Ganz catheters, once the definitive ICU monitoring tool, are approaching obsolescence, with multiple trials failing to show benefit [9].

When it comes to ICU monitoring, neither naïve faith nor nihilism is appropriate. Intensivists should judge monitoring tools by the insight they provide and the outcomes that accrue. To do this, clinicians should understand

technical and physiologic underpinnings and consider the evidence supporting a link between monitoring and outcome. To this end, we have devoted this issue of the *Critical Care Clinics*. The range of topics covered by our all-star panel should interest all intensivists. We begin with a novel review by Friedman and colleagues that provides practical advice on choosing, designing, and implementing an electronic medical record. Next, Marik and Baram offer a comprehensive overview of noninvasive hemodynamic monitoring, after which Magder provides an elegant discussion of invasive techniques. Lui and colleagues follow with a timely piece devoted to intra-abdominal pressure monitoring, and Ezzie and colleagues present a provocative critique of routine laboratory testing. Next, Sakharova and Inzucchi thoughtfully review the benefits and sometimes unexpected pitfalls of metabolic monitoring. Two masterful reviews devoted to the central nervous system follow. The first, by Gunther and colleagues, addresses screening and assessment of cognitive dysfunction, while the second, by Wartenberg and colleagues, describes multimodality techniques used in neurocritical care. Next, Rubinowitz and colleagues provide a comprehensive overview of diagnostic imaging, replete with instructive images, advice on choosing appropriate tests, and a guide to interpretation. Two pulmonary reviews follow. The first is a state-of-the-art manuscript by Bekos and Marini devoted to monitoring mechanical ventilation. The second, by Siner and Manthous, offers a novel critique of methods used to assess readiness for liberation from the ventilator. Finally, we round out this issue with a contemporary overview of severity of illness and organ failure assessment by Afessa and colleagues and a compelling discussion by Berenholtz and Pronovost devoted to monitoring patient safety.

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Mark D. Siegel, MD  
*Pulmonary & Critical Care Section*  
*Department of Internal Medicine*  
*Yale University School of Medicine*  
*PO Box 208057*  
*333 Cedar Street*  
*New Haven, CT 06520-8057, USA*  
*E-mail address: [mark.siegel@yale.edu](mailto:mark.siegel@yale.edu)*

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