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Where PICU Beds Are Lacking, the Model of “Extended NICU” May Help to Treat Infants and Small Toddlers Who Are Critically Ill, Even During the COVID-19 Pandemic



To the Editor:

We read, with great interest, the article by King et al¹ in *CHEST* (May 2022). The authors highlight that PICU capacity is far less than that of adult ICUs and is extremely important to plan PICU surge capacity in case of a new COVID-19 pandemic wave in children < 12 years old who are not vaccinated. The authors propose to admit children in adult ICUs if they are \geq 12 years old with illnesses common in adulthood. Pozzi et al² recently published an analysis on PICU beds in Italy underlying the necessity of increasing its total number and distribution in the country. Data suggest that critically ill children who are admitted to PICUs receive higher quality of care with lower mortality rates than those admitted to adult ICUs.³ Considering that infants account for approximately 30% of all PICU admissions, the authors suggest, for areas with limited PICU beds, to establish some “extended NICUs” to treat infants and small toddlers, after staff members have received appropriate training in pediatric critical care medicine. We think this model could have several advantages compared with that proposed by King et al.¹ First, the majority of infants and toddlers who necessitate admission in PICUs have diseases contracted during the perinatal period, such as congenital disorders, perinatal asphyxia, or consequence of prematurity. Neonatologists are more prone to treat such diseases than adult intensivists. The second consideration regards the need for PICU admission of pediatric patients with COVID-19 disease.⁴ The recent analysis by Ward et al⁵ shows that risk of PICU admission and death from COVID-19 in children was very low. The odds of PICU admission with COVID-19 disease were increased in children younger than 1 month and decreased among 15- to 17-year-old patients compared with 1- to 4-year-old patients. All considered, 51.1% of children admitted to PICU for COVID-19 disease were \leq 4 years old. These data suggest that the model of “extended NICU”

would also be beneficial for a possible COVID surge among children in areas with few or even no PICU beds. The authors also highlighted the role of teleconsultation that could be a valuable tool in the context of PICU bed shortage. Moreover, the model proposed by the authors is based on the health care system in the United States. Differences among health care organizations and medical training should be taken into consideration if the proposed model will be considered in other countries around the world.

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Response



To the Editor:

We are grateful for the comments made by Decembrino et al. We chose in our article to focus on the role that adult ICUs may play in the care of critically-ill children during a public health emergency, given that the readership of *CHEST* includes a preponderance of physicians in adult pulmonary and critical care medicine. However, the broader point made in their letter is an important one. During public health emergencies, flexibility in age-based admission criteria can be a useful tool for offloading potentially overwhelmed parts of a health care system. Adults who received care in PICUs during the COVID-19 pandemic appear to have had acceptable outcomes when compared with anticipated mortality outcome in an adult unit.¹

We note that the study by Cogo et al² that reported worse outcomes for children in adult ICUs specifically studied these outcomes in children ≤ 14 years old. We agree wholeheartedly that the care of children is best entrusted to experts in that care, at least under normal conditions. In our article, we only recommend consideration of admitting children ≤ 14 years old to an adult ICU in the setting of genuine crisis of care, when a health care system is overwhelmed and the customary standard of care cannot be maintained. Interestingly, children aged ≥ 12 years old had comparable outcomes when admitted to either an adult or pediatric unit based

on prospective data from the United Kingdom, although there may be differential outcomes, depending on the admitting diagnosis.³

There are approximately 23,000 neonatal ICU beds in the United States, which is considerably fewer than the 75,000 adult medical, surgical, and cardiac ICU beds but dramatically more than the 5,000 PICU beds.⁴ Although the impact of the COVID-19 pandemic on infants and young children has been significantly less than the impact on adults, it is not difficult to imagine a future emergency with greater numbers of ill children. In such a setting, both neonatal and adult ICUs may need to support our pediatric colleagues, with the common aim of sustaining systems of care for all patients.

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