Dedicated cardiac intensive care units: Good for the patient, good for the surgeon

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Specialized care—simulation of neonatal resuscitation.

Central Message

Specialization of care improves outcomes, but how it does so requires further investigation. Generalizability to subgroups of neonates with noncardiac anomalies is yet to be established.

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One might expect that readers of this *Journal* would look favorably on contributions that highlight the superiority of specialized cardiac intensive care units. They reinforce the surgeon's perspective that specialized units are better for the patient. Such views may also arise because specialized units are better for the surgeon. Streamlining of daily activities, more direct involvement in managing capacity, sharing the burden of postoperative care with colleagues who are interested in cardiac work, and an opportunity to have a bigger say in the characteristics of care provided are commonly held advantages.

In this issue of the *Journal*, Johnson and colleagues¹ have extended the thrust of a single-site study to a large administrative data set that is broadly representative of US practice, but important questions are only partially addressed. In part, this relates the intention to treat design, in which outcomes are described according to initial location of care. Comparisons between cardiac intensive care units (CICUs) and neonatal intensive care units are robust, but outcomes of care provided by pediatric intensive care units are not well captured. The role of the neonatal intensive care unit in providing care for premature, low-birth weight neonates has not been fully elucidated, and the impact of this subgroup on the overall result requires further exploration.

In the study of Johnson and colleagues,¹ there was no difference in mortality according to site of initial admission. Initial CICU admission was associated with reduced perioperative length of stay; this, together with a reduced infection rate in CICU, were the main drivers of reduced hospital costs by 18% relative to those initially admitted to a neonatal intensive care unit. When models were stratified by age at admission, however, there were no differences in cost for initial admission at 1 day of age or younger. In most institutions, neonates would constitute a large

proportion of cases. The CICU was thus mostly better in terms of broad early clinical outcomes, and it was sometimes cheaper.

The mere possibility that simple reorganization of the initial care location may allow an 18% improvement in the budget bottom line demands our further attention. How does the initial care location have any effect on eventual outcomes and costs? Johnson and colleagues¹ suggest that initial care location is a proxy for care specialization. Evidence certainly exists for improved outcomes in premature neonates managed in highly specialized services.^{2,3} So what key elements relevant to specialization of care in “cardiac” neonates could promote improved and more efficient care? Continuity of care is likely to be a prime mover, with fewer handovers, lower information loss, and less “getting to know the patient” time.

In their analysis, Johnson and colleagues¹ have been careful to adjust for center surgical volume, which has previously been shown to influence outcomes in pediatric cardiac surgery.⁴ Unit level assessments of volumes undergoing “unfractured” or single-unit preoperative and postoperative care within the same institution are not reported. This leads to the possibility of effect modification—that the known effect of high surgical volumes is present but only seen in hospitals in which all patients receive the entirety of their perioperative care in a single unit.

The maxim, “Every system is perfectly designed to get the results it delivers,” generally holds true. The Institute for Safe Medication Practices described the hierarchy of system intervention effectiveness,⁵ a risk management theory that rates interventions relying on human behavior as less effective than system-focused technologic interventions designed to suit the complexity of care. So, can it really be a simple matter of “practice makes perfect” leading to growing expertise in individuals involved in the care of these babies? Risk management theory⁵ suggests that individual training and education levels in any craft group alone are unlikely to have sufficient impact to account for the differences seen in this study.

A more likely alternative is the “this is how we roll” hypothesis: the combined experiences and iterative learning by groups of clinicians may account for the observed differences in length of stay and cost. It is possible that the real message in this research is the potential for groups of clinicians with experience of the complete patient journey to

work together to develop individual expertise and also to evolve and adapt the care environment, care processes, and tools.

It might just be that what is good for the surgeon is also good for the patient.

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