

## Communication Failure—Who's in Charge?

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### The Case

A 20-month-old boy was admitted to the intensive care unit (ICU) following a Fontan surgical procedure for hypoplastic left heart syndrome. The child initially made good progress. He was weaned from inotropic support and tolerated enteral liquids on the first postoperative day. That evening the child developed respiratory distress with acidosis and fever. The resident physician notified the on-call ICU attending, who came in from home to manage the child's respiratory status. The surgeon called from home to check on the child at midnight and spoke with the resident, who indicated that the child had suffered respiratory deterioration and that the ICU attending was at the bedside managing the patient. The surgeon requested an echocardiogram but did not speak directly to the ICU attending, and the cardiology fellow who performed the echocardiogram communicated results to the surgeon, the child's attending of record for this admission.

After stabilizing and monitoring the child's respiratory status, the ICU attending returned home. The resident communicated with the ICU attending by phone and pager through the rest of the night, as the child's status was not improving as expected. The resident assumed the ICU attending was communicating with the surgeon, and did not contact the surgeon or cardiologist. The child suffered a cardiac arrest at 7:00 AM from low cardiac output. The surgeon and cardiologist arrived in the ICU for rounds just minutes before the arrest. Despite aggressive resuscitation efforts, the child suffered massive brain injury and subsequently died.

In post-event debriefings, staff identified several issues in the care of this patient. The attending surgeon and cardiologist were only briefed on the initial respiratory distress and did not have a complete picture of the child's condition; similarly, the ICU attending focused on stabilizing the child's respiratory status and missed his low cardiac output. There was confusion among the resident physicians and nursing staff about who was coordinating the child's care, and a lack of awareness of how to ensure effective team communication when multiple attending physicians are involved in caring for a child. The residents and nurses noted that having the ICU attending physician at the bedside left them with the impression that the surgeon and cardiologist were being updated about the child's continuing deterioration. The nurse

observed the resident on the phone frequently discussing the case, and did not realize that no one was communicating with the other physicians involved. The resident and nurse either did not recognize the need to escalate the case beyond the ICU attending, or were not comfortable doing so. The surgeon and cardiologist were under the impression the child's issues were respiratory, not multi-system, and because of this, as well as the belief that the attending ICU physician was in-house throughout the night, neither of them recognized a need to go to the hospital to evaluate the child.

## The Commentary

On the surface, this outcome has a straightforward cause. There was too little discussion between the attending physicians about a critically ill child. It wasn't clear which service was "in charge." These issues were appropriately discussed in debriefings. Assuming the debriefing sessions went as do most, everyone grimly shook his or her head and agreed to do better next time. Case closed.

Yet, if that is all that happened, the next child in this same condition in this same institution will have just as high a risk of dying.

The dialogue must go well beyond a discussion of who is in charge. There are two mutually exclusive leadership strategies in action here: "the-captain-of-the-ship" strategy is stereotypically surgical and "the-orchestra-conductor" strategy is stereotypically medical. The surgeon must be the captain in the operating room (OR) and, as all good captains, solicits and listens to the inputs of the anesthesiologist, perfusionist, nurses, and others. However, with this style, at all times operating room decisions belong to the surgeon. The intensivist must weigh the data and move patient care forward by directing and focusing a team of ICU providers and consultants, as would an orchestra conductor. At different times during this child's care, both management styles were necessary. The providers caring for this child had no conductor.

It is now trite to comment that handovers are risk laden (1,2), but the first point at which error was likely introduced was in OR to ICU handover. To purposefully persevere, it is here where the surgeon must pass the leadership role to the intensivist and where leadership style transforms from captain to conductor mode. To keep the musical metaphor, the virtuoso soloist (i.e., the surgeon) must now sit and become precisely engaged with the rest of the musicians all coordinated by the intensivist. All of the orchestra members must be clear on their roles and ready to play at the appropriate times. Failure of this transition of roles and care can impair care and communication moving forward, as it did in the case. Failure of the intensivist to grab the baton and effectively conduct was, in this case, lethal.

At the moment of this first transition of care (i.e., the OR to the ICU), the surgeon clearly has the best understanding of the anatomy, surgical procedure, and potential or likely related problems; the anesthesiologist has the best understanding of the physiology, responses to therapies, and physiologic goals; whereas the cardiologist has the best longitudinal view of the patient's trajectory; and nurses and others best understand key pieces of the "big picture." An automated tool was introduced a decade ago (3) for adult perioperative cardiovascular procedures. Specific focus on perioperative transitions of care for children with congenital heart disease is more recent.(4) However, precision in these handovers of care is rather abysmal (2,4) and, it can be argued, is even still not being approached correctly.(5) The "big picture" must coalesce in the mind of the new leader, the "orchestra conductor," the intensivist, and be clear to the

rest of the players in the care team.

So in this case the issue of who was "in charge" is quite real. Regardless whether the unit was "open" or "closed," someone must always fill a role *more than* the attending of record; someone must be in charge. We suggest that someone be the intensivist.(6)

We further believe that this child died because no one constructed or shared a complete mental model (7,8), much less a team mental model.(9) Said another way, this child's arrest and subsequent death were surprises to everyone because quite literally no one knew what was going on. Adequate systems were not in place to establish, review, or revise team understanding of the situation either at the time of handover or as the night wore on. Even if the mental model generated at the time of handover from the OR to the ICU was "good repair and good function," and the model constructed at the time of deterioration was "respiratory failure associated with pneumonia," mental models require constant reassessment and validation. When, as in this case, data falls outside what the mental model predicts or therapy does not produce the expected improvement, unit culture must support an inquiry process that engages all relevant team members in reassessing their understanding of the situation. Structured briefings and handovers, board rounds, and huddles can help achieve this when conducted by open and responsive leaders.(10)

The literature unequivocally supports leadership and teamwork as critical components of effective critical care.(11) Well past the time of this child's handoff from the OR, when the resident assumed the ICU attending was communicating with the surgeon, and therefore did not contact the surgeon or cardiologist—there was a failure to communicate. That the resident did not effectively facilitate the communication is lamentable but understandable, as few programs teach communication skills.(12) Communication research must move well past closed-loop communication work focused on short-term situations (e.g., cardiac arrest [13]) and through strong leadership become a part of the critical care culture. Work on improving communication also needs to more explicitly develop the team leader's skills in eliciting the concerns of everyone who may have critical information, including junior residents, nurses, and family members. The debriefings in this case should have included efforts to determine whether the resident, the nurse, or others had concerns about the patient that remained unstated, or were stated and not resolved. The implications of the resident and nursing staff not recognizing the seriousness of the child's condition are rather different than the implications of recognizing the severity of the situation and not being able to mobilize an appropriate response from the attending physicians involved.

This child died of a sequence of system errors. At the system level, there is a push to create pediatric cardiac intensive care units (PCICUs) with multidisciplinary teams focused on children with cardiac problems. The logic behind this push seems solid; there is evidence that adult surgical outcomes improve when care for high risk, complex patients is concentrated in centers that care for these patients in greater number.(14) Intuitively, concentrating expertise (physician, nursing, respiratory therapy) and cohorting children with cardiac disease should improve outcomes. However, the only available data on aggregating children into PCICUs did not find improvement in length of stay, morbidity, or mortality between patients cared for in dedicated PCICUs compared with those cared for in multidisciplinary PICUs, with the exception of a few specific cardiac diagnoses (transposition of the great arteries and atrio-ventricular canal).(15) Further, the adult data cited above supporting patient cohorting also discovered procedures where aggregation of patients offered no discernable benefit.(14)

As such, it cannot be concluded this child would still be alive were he cared for in an independent PCICU. There are insufficient data anywhere to know whether the hybrid organizational model of cohorting this child on a "cardiac service" within a multidisciplinary PICU would help. At a minimum, such cohorting would allow the members of the ad-hoc team that necessarily coalesce around the care of this complex child to be pulled from a smaller circle of possible providers to create well functioning expert teams.<sup>(16)</sup> Whether the structure is PCICU or PICU, the multidisciplinary team must be integrated with overt leadership, coordination, and communication patterns.

Cases like this demonstrate that the combination of a well-defined organizational model, clear team communication, member role definition, and culture are all required to provide optimal care for the critically ill pediatric cardiac patient. Without these components, the orchestra's music will be discordant, and poor patient outcomes, like this one, will continue.

### Take-Home Points

- In the care of complex patients, one physician must be designated and assume responsibility for maintenance of the complete mental model and direct the care.
- The designated physician should manage and weigh inputs from the myriad professionals necessarily involved in the care of a complex patient to formulate the mental model and care plan.
- Effective communication must insure that all team members share a common mental model and openly discuss their views.
- Data inconsistent with the common mental model must be reconciled.
- There is not yet evidence to support a specific system structure in which care for children with congenital heart disease must be delivered, but regardless of where patients are cared for, all teams should have the first three take-home points above in their function framework.

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