

Correspondence

Dear Editor:

It was with interest that we read the article entitled "Extracorporeal Life Support of Neonates with Congenital Heart Defects: Techniques Used During Cardiac Catheterization and Surgery" (Faulkner SC, Chipman CW, Moss MM, et al. *J Extracorp Technol.* 1994; 26(1): 28-36). The details of what is necessary to transport and manage children undergoing ECMO for cardiac support were well presented. Additionally, utilization of the ECMO circuit while performing the cardiac repair or converting to conventional cardiopulmonary bypass were well described.

However, we take issue with the authors' description of who should be involved with the care of these children during cardiac catheterization, transport and cardiac repair. The statements on pages 29 and 30 ("Communication between the cardiologist and the ECLS technician is of the utmost importance..." and "The cardiologist will advise the ECLS coordinator and specialist when cineangiography is to be performed.") imply that a perfusionist is not present during these procedures. In the majority of ECMO centers, the coordinator is a registered nurse, respiratory therapist or a physician — rarely a clinical perfusionist. In the April 1994 Directory of Regional ECMO Centers distributed by ELSO, of 104 active centers that listed an ECMO coordinator, only seven had a perfusionist in that capacity. This is also the case with the "ECMO specialists" who are charged with the daily routine monitoring of the ECMO circuit. (1) These health care providers are all recognized professionals in their chosen fields, but most have a limited and specialized training in the application of cardiopulmonary bypass techniques and procedures as they are applied toward a select group of patients requiring long-term cardiopulmonary bypass.

Our concern is that transport and cardiac catheterization, not to mention intraoperative cardiac repair, are not routine periods of ECMO support. While we agree that the transport of a child on ECMO can be done safely, it is not a completely benign event. The risk of a catastrophic event occurring during transport is not eliminated, but simply involves a new set of hazards — accidental decannulation, air embolism, mechanical malfunction with the ECMO circuit, etc. Once the child has arrived in the catheterization lab, all the risks associated with cardiac catheterization are still present. Perforation of the heart, aortic dissection and ventricular fibrillation are still potentially lethal emergencies — on or off ECMO. A 1990 position paper written by the Society of Thoracic Surgeons and endorsed by the American Association of Thoracic Surgeons describes the role of clinical perfusionists in the application of percutaneous femoral bypass in adults. (1) Do we as a profession owe the pediatric

patients less? As for intraoperative cardiac repair on ECMO, is there doubt among members of our profession that a clinical perfusionist should be involved? Adding hemodilution, hypothermia, myocardial preservation and complete anticoagulation to an ECMO run sure sounds like conventional cardiopulmonary bypass, despite extrathoracic cannulation.

Our experience at St. Louis University Health Sciences Center and Cardinal Glennon Children's Hospital includes 417 children (298 neonates, 80 cardiac and 39 pediatric respiratory) through April, 1994, representing approximately 58,000 hours of ECMO support. We have what we think is a very experienced ECMO team with some of our "ECMO specialists" having been with us since the inception of the program in 1982. Nevertheless, our policy is still to have a clinical perfusionist present during any period of ECMO when a non-routine event is occurring, e.g., transport, cardiac catheterization, wound exploration, diaphragmatic hernia repair, and equipment change or insertion. Our billing includes equipment charges and initiation of support followed by a small daily fee. Any additional activity by the perfusion staff is included in the daily fee charge. This has allowed us to keep patient costs down and keep the perfusion staff involved in the care of patients receiving extracorporeal support.

The question that we as a profession have to ask is, "Which profession should be tasked with monitoring of patients undergoing long-term extracorporeal circulation?" There is no easy answer. The use of non-perfusionists in the role of "ECMO specialist" has become the accepted norm. These individuals have allowed the application of ECMO to spread from large teaching institutions to community-based programs. They are certainly a cost-effective use of manpower given the ability of registered nurses and respiratory therapists to be used in the hospital elsewhere if not needed to "sit the pump." Without a doubt ECMO, as it is now performed, could not have progressed to the point it is today without the valuable input and excellent care that is provided by these individuals. Patient care of children receiving ECMO may be enhanced by the utilization of nurses and respiratory therapists in the role of "ECMO specialist." (2) In this current atmosphere of cost cutting and competition for fewer health care dollars, it is possible that hospital administrators may initiate personnel reductions for individuals who are not able to be used in an alternate capacity. The argument may well become this: If "'ECMO specialists' are all that is needed to perform ECMO, then why can't they also perform cardiopulmonary bypass?" Our answer to this question is simple. Clinical perfusionists are qualified by education and training to safely apply extracorporeal techniques and procedures in all situations where it is necessary to support or supplant the patient's own circulatory or respiratory systems. (3) Additionally, clinical perfusionists are

knowledgeable about the physiological effects of extracorporeal circulation.

In conclusion, clinical perfusionists should insist upon the inclusion of our profession in any application of extracorporeal circulation, regardless of what it is called. Perfusionists should accept a larger responsibility for the application of extracorporeal technology in scenarios broader than merely cardiopulmonary bypass. ECMO and all its variations, V-V bypass for liver transplants, and ventricular assist devices are all procedures that require the specialized skills that a clinical perfusionist is qualified by education and training to provide. The care of patients receiving ECMO therapy care can only be enhanced by including experts in extracorporeal circulation. Finally, we need to impress upon the institutions with which we are affiliated that inclusion of clinical perfusionists in ECMO therapy is essential in providing the safest care possible.

Sincerely,
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2. Allison PL, Kurtz M, Graves DF, Zwishchenberger JB. Devices and monitoring during neonatal ECMO: Survey results. *Perfusion.* 1990; 5: 193-201.
3. AmSECT Perfusion Scope of Practice. American Society of Extra-Corporeal Technology.

Dear Editor:

The concerns posed by Raithel, et al, are complex and controversial but well-founded. We agree that a perfusionist should be available for any non-routine procedures during ECMO and have active involvement of certified clinical perfusionists in our program especially for non-routine procedures.

Unfortunately, not all ECMO centers have the luxury of an involved perfusion department. Odell and colleagues reported less than 5 % of extracorporeal life support (ECLS) specialists were perfusionists. (1) While only 16 % of all ECLS centers report perfusionist involvement, that involvement when present may simply be circuit set-up. As reported by Rivard (1), 49 % of ECLS centers only "used perfusionists to set up and prime the ECMO circuit or act as perfusion consultants."

We agree involvement of perfusionists has a positive impact on an ECLS program. However, perfusionists do not always want to be involved. We often are called by ECLS coordinators for advice because the perfusionists at their hospital have declined a request for assistance. A litany of incidents of perfusionists refusing to be involved with ECLS continues to surface at ECLS meetings and should be viewed as a professional embarrassment. The few perfusionists that attend the ECLS meetings strive to raise the professional standards of ECLS and the group in St. Louis should be lauded for such involvement.

On the other hand, just because someone has CCP behind his name does not mean he knows ECLS. Certainly this person can keep a pump going but this comprises only a small portion of the care of an ECLS patient. Continuing education courses containing sections on ECLS are offered at numerous locations throughout the year. Local training is also available as most ECLS teams have in-house continuing education and annual recertification examinations.

The patients on ECLS are no longer neonates with a straightforward 5-7 days of support. More difficult patients such as postoperative cardiac patients require the interaction of a multi-discipline team of physicians and other health care providers. One patient may require infectious disease, nephrology, cardiology, cardiovascular surgery, pharmacology, dietary, respiratory, neurology, radiology, and ECLS physicians all working together to provide patient care. Likewise, nursing, respiratory therapy, and perfusion should be capable of meshing their expertise to give the patient the best chance for recovery.

"Egos must be left in the parking lot" (J. Fasules, MD. Cardiac State-of-the-Art Address. *ELSO.* 1993). We as health care providers must remember the reason we are here: the patient. If we can put turf battles aside and appreciate the knowledge of our colleagues, learn diplomacy, and work as a team, will we not provide the patient with the best possible care?

Again we applaud the involvement in ECLS of the perfusionists of St. Louis University Medical Center. We, too, echo their request for a greater role of perfusionists and encourage them to join the ECLS team at their hospital and begin to learn as well as share their expertise.

Sincerely,
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BIBLIOGRAPHY

1. Odell RM, Erickson R, McEwan RM. Identification and certification of extracorporeal membrane oxygenation specialists in the United States. *ASAIO Journal.* 1992; 858-861.