

optimal depth of its insertion into the DLT. The modified design needs only be produced in the small and medium sizes.

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Anesthesiology  
77:610, 1992

### Transesophageal Echocardiography in Pediatric Cardiac Surgery

*To the Editor:*—The recent fine paper by Muhiudeen *et al.*<sup>1</sup> and the accompanying editorial by Weintraub and Sahn<sup>2</sup> admirably outline the complexities as well as the strengths and weaknesses of intraoperative transesophageal versus epicardial echocardiography used during surgical repair of congenital heart disease. They rightly point out that transesophageal echocardiography provides accurate assessment of surgical repairs of complex congenital heart defects, with the caveat that assessment of right ventricular outflow tract anatomy and valvular regurgitation is unreliable with currently available pediatric transesophageal echocardiography.

The degree of expertise and technical complexity evident in this report, the multidisciplinary authorship of the paper, and its appearance in an anesthesiology journal all beg the question: is it reasonable to expect that anesthesiologists can realistically do intraoperative transesophageal echocardiography assessments of complex congenital heart disease repairs? Furthermore, who watches the patient during the sometimes prolonged intraoperative transesophageal echocardiography assessment during the period of instability after bypass following a flawed surgical repair?

Intraoperative transesophageal echocardiography assessments that prompt surgical revision of complex congenital repairs during cardiopulmonary bypass should be at least as expert as the original preoperative decision for surgical repair itself. Anything less is unacceptable because the risk of reinstitution of bypass and revision of a complex repair may be substantial, particularly when the original bypass and aortic cross-clamp times have been prolonged. In our own institution, the pediatric cardiac anesthesia staff, who are also board certified in pediatric radiology, do not feel qualified to make such judgments with the degree of expertise necessary to justify such risks; when such decisions are made, full-time echocardiographers are involved. Given that the American Heart Association recognizes 35 forms of congenital heart defects and that there are a number of variants of each form,<sup>3</sup> one must ask: is it reasonable for an anesthesiologist who does not have

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*In Reply:*—Hickey raises a number of important philosophical issues regarding the anesthesiologists' involvement in intraoperative transesophageal echocardiography. We affirm Hickey's contention that extensive formal training and ongoing involvement in echocardiography is necessary for independent evaluation of transesophageal echocar-

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(Accepted for publication June 19, 1992.)

extensive formal training for and ongoing concentration in echocardiographic diagnosis of congenital heart defects to make such decisions?

While these questions may well be beyond the scope of the study,<sup>1</sup> such questions are important and arise because of the publication of such a paper. These questions were not addressed either by the authors<sup>1</sup> or by the writers of the accompanying editorial.<sup>2</sup> Although similar questions arise in the use of transesophageal echocardiography for assessment of valvular repairs and ventricular function during and after coronary artery bypass graft procedures, in the case of repair of congenital heart disease these issues are considerably more prominent and deserve comment.

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(Accepted for publication June 22, 1992.)

diagrams in patients with congenital heart disease. From our study, we learned that with appropriate training, an anesthesiologist can properly evaluate the repair. The learning curve has required 12 months of training in adult and pediatric transesophageal echocardiography and 2 yr of required full-time experience in echocardiography