A method has been devised to repair the catheter in such circumstances rather than replace it. The severed catheter is cleaned with appropriate sterilizing agents and a #19 B-D needle inserted into either the right atrial or the pulmonary arterial line. The lumen supplying the balloon tip requires a #20 B-D needle.

Grinding of the bevel of the needle and tapering of its stump facilitates passage into the lumen of the catheter and reduces the possibility of embolizing plastic chips created during insertion. This adaptation is stable, simple to perform, and withstands substantial pressure without leakage. A supply of needles prepared as indicated may be gas sterilized and kept available for use when needed.

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**Echo Technique in Open-Chested Dogs**

To the Editor:

In their paper, "Correlation between echocardiographically demonstrated segmental dyskinesis and regional myocardial perfusion," which appeared in Circulation 52: 1097, 1975, Kerber et al. refer to a paper by Kraunz and Kennedy for a description of the characteristic normal posterior wall motion in human subjects. These authors describe the major movement of the posterior wall as anterior during ejection. They also point out that there is a small initial movement posteriorly (B-C), during isovolumic contraction. In figure 1A of Kerber's paper, the B-C excursion cannot be considered small. In actual fact it represents 53% of the C-D excursion. In addition, if one looks at the relationship between the onset of septal and posterior wall movement, it is apparent that the septal C point corresponds to the posterior wall B point. Furthermore, the septal posterior excursion is greater than the posterior wall anterior excursion, and in addition at what is labeled the D point, the posterior wall has not completed its anterior excursion, even though the septal posterior movement has ceased. The point that is marked E appears well into diastole and coincides with the P wave of the electrocardiogram. This incongruity of noninfarcted septal and posterior wall movement is at variance with the reported normal wall movement in humans. Myerowitz et al. and Stefan and Bing describe two techniques for studying posterior wall movement in dogs. The posterior wall movement pattern they describe correlates with that outlined by Kraunz and Kennedy.

We have looked at the suitability of open-chested dogs for assessing posterior wall movement. We found that it was impossible to "fix" the transducer to the anterior heart wall. Even though several clamps were used, there was always some movement of the transducer. Figure 1A shows the transducer (T) on the myocardium. Using the R wave of the electrocardiogram as a reference point, the major movement of the posterior wall is away from transducer, that is posteriorly, and it sustains this position throughout systole. In IC, the transducer does not make direct contact with the myocardium, and ultrasonic coupling is established by means of a saline bath, which lies on the myocardium. The major movement of the posterior wall is anterior. Thus, the method used to couple the transducer to the open-chested canine heart can result in very different patterns of wall motion. Figure 1A is an example of transducer movement-induced artifactual posterior wall dyskinesis. It is also interesting to note that the septal motion varies with the position of the transducer. In A its major movement is posterior following the R of the QRS, and in C its major movement is anterior.

In reviewing the description of the model given in a previous paper by these authors, no attention has been paid to the problem of transducer artifact-induced posterior wall movement. It is important to address oneself to this problem, particularly as one of the conclusions in their present paper suggests that segmental dyskinesis has occurred in normally perfused myocardium immediately adjacent to areas of ischemia. Is it possible that the segmental dyskinesis seen in this normal area is due to anterior motion of the transducer induced by contraction of the subjacent myocardium?
anterior myocardium, which moved the transducer further away from the posterior wall, thus giving the impression that the posterior wall was actually moving away from the “fixed” transducer.

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The authors reply:
To the Editor:
There are several points we wish to make in response to Dr. Cahill’s letter. These are:
1) We are well aware that transducer motion introduces echocardiographic artifacts. Because of this we stated in our paper that “the transducer was fixed in place by a stationary arm to avoid transmitted motion from the heart, so as to provide a fixed reference point.” In addition to attaching the transducer to a rigid arm we apply sturdy tape strips stretched across the arm from both sides of the surgical table to minimize transducer motion. The grossly distorted posterior wall motion shown in figure 1A of Dr. Cahill’s letter can only be produced by allowing the transducer to bounce freely on the heart. Dr. Cahill’s figure 1A shows an obviously artificial posterior movement of the posterior wall throughout systole. Contrast this with the control echocardiographic recording in our figure 1 which shows the expected anterior motion of the endocardium through the systolic ejection (C-D) period.
We learned several years ago during our initial studies with this model that if posterior motion of the nonischemic posterior wall is seen during systolic ejection, the transducer is inadequately secured to the epicardium. If so, we reposition and resecure it before the protocol is begun.
2) In this model, changes in ultrasonically registered wall motion appear within several seconds after coronary occlusion. The type of dyskinesis recorded is very similar to those recorded by other investigators using a variety of techniques—from the classic experiments of Tennant and Wiggers' to current studies utilizing implanted ultrasonic dimension gauges.3,4
3) Given the necessity in our model of an open chest and an open pericardium it is hardly surprising to observe some differences between our ultrasound recordings and echocardiograms obtained from closed-chest human subjects. Dr. Cahill has noted some of these. Overall, however, the recordings from animal and humans are quite similar.

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Letter: Echo technique in open-chested dogs.
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