Pulmonary artery catheterisation

Catheterisation is useful when used by experienced clinicians

EDITOR,—Neil Soni's editorial arguing for re-evaluation of the use of pulmonary artery catheters¹ seems to be of far more value than the study in *JAMA* that it discusses.² I agree with Soni that the study's method, in terms of retrospective matching of controls, is unreliable. I would also add several other criticisms. Most importantly, the study did not address the question of what was done with the catheters after they had been placed, or by whom the derived information was used.

All too often, catheters are introduced at the request of senior staff but, once in place, are used for assessment of cardiac output only once or twice a day. Often the data obtained are not acted on immediately by senior staff working in intensive care; instead, junior staff react to them with varying degrees of appropriateness. It is not surprising that patients treated in this way do badly.

Several different methods of continuous measurement of cardiac output and systemic vascular resistance are now available; most are accurate and simple to use. When these methods are used either by experienced clinicians or in combination with well thought out treatment protocols better results can be expected. Only studies that address these issues should influence our judgment on pulmonary artery catheterisation.

I hope that if the paper by Connors *et al*² has any effect it will be to bring people's attention to these new technologies rather than to ban them.

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- 1 Soni N. Swan song for the Swan-Ganz catheter? *BMJ* 1996;313:763-4. (28 September.)
- 2 Connors A, Speroff T, Dawson N, Thomas C, Harrell FE Jr, Wagner D, *et al*. The effectiveness of right heart catheterization in the initial care of critically ill patients. *JAMA* 1996;276:889-97.

Proposed moratorium on use of pulmonary artery catheters is premature

EDITOR,—Neil Soni draws attention to an important study on the apparent outcome of pulmonary artery catheterisation in five American teaching hospitals.^{1,2} Some caution may need to be used in interpreting the results of this paper, particularly in relation to British practice.

More than one million pulmonary artery catheters are sold in the United States each year; this equates to approximately 3.8/1000 population. In Britain, use is less than a tenth of this figure. Connors *et al* chose nine disease categories to study²; these included cirrhosis, metastatic colon cancer, and lung cancer, but patients with these diseases are highly unlikely to receive aggressive intensive treatment in Britain. Furthermore, patients with trauma, head injury, burns, and pregnancy were specifically excluded, and routine perioperative management of high risk surgical patients was not included despite evidence suggesting that these patients benefit from pulmonary artery catheterisation.³ Surgical

patients were included in the study only if pulmonary artery catheterisation was performed postoperatively after complicating factors had developed; some authors already believe that this group may not benefit from aggressive treatment.⁴

Connors *et al* found that the factors most commonly associated with the use of pulmonary artery catheters were male sex, private insurance, and diagnosis on admission; at least one of these factors has little bearing on British practice. There was also a considerable overlap in the patients with and without pulmonary artery catheters (a considerable part of the analysis depended on this), and 46% of the patients in whom a pulmonary artery catheter had been inserted could be matched with another without a catheter with a comparable propensity score and diagnosis on admission. This suggests a great inconsistency in the use of pulmonary artery catheters by the hospitals in the study.

The study raises some important points about the merits of pulmonary artery catheterisation, and the recommendation for a large randomised controlled trial will surely be welcomed. Nevertheless, the suggestion of a moratorium on the use of pulmonary artery catheters⁵ is premature and worrying, since such an action in the United States would inevitably have consequences in Britain.

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- 1 Soni N. Swan song for the Swan-Ganz catheter? *BMJ* 1996;313:763-4. (28 September.)
- 2 Connors A, Speroff T, Dawson N, Thomas C, Harrell FE Jr, Wagner D, *et al*. The effectiveness of right heart catheterization in the initial care of critically ill patients. *JAMA* 1996;276:889-97.
- 3 Boyd O, Grounds RM, Bennett ED. A randomized clinical trial of the effect of deliberate perioperative increase of oxygen delivery on mortality in high-risk surgical patients. *JAMA* 1993;270:2699-707.
- 4 Hayes MA, Timmins AC, Yau EHS, Palazzo M, Hinds CJ, Watson D. Elevation of systemic oxygen delivery in the treatment of critically ill patients. *N Engl J Med* 1994;330:1717-22.
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Pulmonary artery catheters should be banned from intensive care units

EDITOR,—I congratulate Neil Soni on his controversial editorial questioning the value of pulmonary artery catheterisation.¹ I have long been deeply cynical about the value of pulmonary artery catheters in critically ill patients. While they undoubtedly provide fascinating physiological data, there is no evidence that they play any part in reducing mortality.

In the intensive care unit at this hospital pulmonary artery catheters are associated with a 92% mortality. This does not mean that they actually cause death, since we reserve them for our illest patients, who have a high risk of death in any event, but it suggests that they are seldom of benefit to the patients.

It is hard to prove that pulmonary artery catheters have a negative impact on patients' survival despite the recent paper by Connors *et al*.² It is easy, though, to postulate two mechanisms by which pulmonary artery catheters may tip the

balance between life and death in unstable patients—namely, through sepsis and fluid overload. About a tenth of our patients with pulmonary artery catheters develop septicemic complications, which resolve when the catheter and its sheath are removed. Fluid overload, as judged by a positive fluid balance of more than 10 litres over three days, seems to be quite common in patients with a pulmonary artery catheter. I have encountered two patients in the past year who were grossly overloaded with fluids because inexperienced but enthusiastic junior doctors maintained a pulmonary artery wedge pressure at some hypothetical optimum level without reference to other variables such as systemic blood pressure, central venous pressure, urine output, inotrope dependence, peripheral oedema, pulmonary oedema, and daily fluid balance.

I disagree with Soni on one point: I believe that pulmonary artery catheters should be banned from intensive care units, except possibly as an educational or research tool. They are expensive and potentially dangerous and of no proved benefit. Worst of all, they introduce an element of pseudoscience into the care of critically ill patients, which is an area of medicine where we urgently need a cool and scientific reappraisal of what we are doing.

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- 1 Soni N. Swan song for the Swan-Ganz catheter? *BMJ* 1996;313:763-4. (28 September.)
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When deciding which letters to publish we favour originality, assertions supported by data or by citation, and a clear prose style. Wit, passion, and personal experience also have their place.

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Letters should be typed and signed by each author, and each author's current appointment and address should be stated. We encourage you to declare any conflict of interest.

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