DO ALTERNATIVES TO PULMONARY ARTERY CATHETER REALLY EXIST?

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Background:
Since the introduction of the balloon flotation-assisted pulmonary artery catheter (PAC) in the 1970s, PAC based hemodynamic monitoring has been considered part of the standard of care in managing critically ill patients. In 1996, Connors et al ¹ made the disturbing observation that mortality might actually be higher among patients whose therapy was guided by the data obtained from hemodynamic monitoring with a PAC than in matched controls. Since then there were an intense debate regarding the safety, usefulness and effectiveness of PAC in directing therapy in attempt to reduce mortality. Several 'new' techniques are now available that provide easier cardiac output measurement. None of them emerges as more accurate than the others, although no formal comparisons have yet been attempted. They are still relatively invasive, requiring either sedation or mechanical ventilation for esophageal Doppler and Fick/carbon dioxide methods, or arterial and central venous access for pulse contour techniques. Esophageal Doppler is operator dependent, training is required to obtain 'optimal' aortic velocity signals, and probe repositioning is mandatory if reliable results are to be obtained. The pulse contour methods also require frequent calibration, and the need for both arterial and central venous catheters preclude their routine use in the operating room. Unlike Doppler and pulse contour, the Fick/carbon dioxide method does not provide an instantaneous measure of cardiac output, but rather a mean value every 3 min. No visible, real-time signal allows the operator to make a critical judgement based on the cardiac output values obtained. This promising technique still requires more extensive validation in critically ill patients, who are haemodynamically unstable and who have lung disease with increased shunt.

References: