

GLOSSARY**EUROSCORE**

European System for Cardiac Operative Risk Evaluation

The learning curve in cardiac surgery

In coronary artery surgery, mortality has been associated with the number of operations that surgeons have performed. This observation prompted Ben Bridgewater and colleagues to examine the 'learning curve' effect, by comparing mortality in patients operated on by newly appointed and established surgeons.

Data were collected on 18,913 patients in northwest England undergoing isolated coronary artery surgery for the first time. In 5,678 cases, the surgery was carried out by surgeons who had been appointed as consultants within the previous 4 years. The remainder of the operations were performed by more experienced colleagues. Observed mortality and predicted (EUROSCORE) mortality were recorded.

There was no significant difference in observed mortality for patients treated by newly appointed or experienced surgeons (1.9% and 2.0% mortality, respectively; $P=0.71$). Mortality in patients treated during the first year of a surgeon's appointment, however, was significantly higher than in the fourth year (2.2% and 1.2%, respectively; $P=0.049$). Adjusting for time and case mix, mortality decreased from 2.3% to 1.0% from the first to the fourth year ($P=0.019$).

While a learning curve effect has been clearly demonstrated, the overall mortality in patients treated by newly appointed or experienced surgeons was similar. The authors stress the importance of managing the learning curve effect by supporting, monitoring and further training newly appointed surgeons, and offering experienced clinical support in non-technical areas such as case selection and perioperative management.

Original article Bridgewater B *et al.* (2004) Improving mortality of coronary surgery over first four years of independent practice: retrospective examination of prospectively collected data from 15 surgeons. *BMJ* 329: 421–425

REPLACE-2: long-term efficacy results

The Randomized Evaluation in PCI Linking Angiomax to Reduced Clinical Events (REPLACE)-2 trial showed that the direct thrombin inhibitor bivalirudin, with provisional

glycoprotein (Gp) IIb/IIIa inhibition, was non-inferior to heparin plus planned Gp IIb/IIIa inhibition in preventing acute ischemic endpoints at 30 days. Major in-hospital bleeding rates were significantly reduced using the bivalirudin strategy, although concerns were raised about a small excess of periprocedural non-Q-wave myocardial infarctions (MI) in this group. Long-term (6 months and 1 year) results from this 6,010-patient trial have now been reported.

A trend towards a lower death rate was shown in the bivalirudin group at 6 months and at 1 year, although MI and revascularization rates tended to be lower in the heparin group at the 6-month stage. None of these trends was statistically significant. Subgroup analysis showed that the trend towards better survival with bivalirudin was greatest in 'high-risk' patients.

The authors conclude that bivalirudin with provisional Gp IIb/IIIa blockade and heparin plus planned Gp IIb/IIIa blockade offer comparable long-term clinical outcomes. They note that the statistically significant reduction in bleeding observed in patients receiving bivalirudin may offset the nonsignificant increase in early MI rate in these patients. Furthermore, bivalirudin offers advantages in terms of cost savings and ease of administration.

Original article Lincoff AM *et al.* (2004) Long-term efficacy of bivalirudin and provisional glycoprotein IIb/IIIa blockade vs heparin and planned glycoprotein IIb/IIIa blockade during percutaneous coronary revascularization. *JAMA* 292: 696–703

Benefits of drug-eluting stents: a meta-analysis

EBM Drug-eluting stents (DES) are designed to reduce the extent of in-stent restenosis following percutaneous coronary intervention (PCI), via the controlled elution of an antimetabolic drug such as sirolimus or paclitaxel. Clinical trials investigating the benefits of DES over bare-metal stents (BMS), however, have been insufficiently powered to generate useful data on rates of mortality, myocardial infarction (MI) or other complications. Babapulle and colleagues have performed a meta-analysis of randomized trials in order to provide this information.

The authors identified 11 appropriate trials involving 5,103 patients, comparing the benefits