The risk model of choice for coronary surgery in the UK

M Petrou, F Roques, L D Sharples, R Kinsman, B Keogh, F Carey, S A M Nashef

RESULTS
The actual mortality was 3.12% (95% confidence interval 2.86% to 3.38%). Parsonnet predicted 5.26%, EuroSCORE additive 2.98%, MCR Bayesian 2.06%, UK Bayesian 3.24%, and EuroSCORE Bayesian 3.23%. Thus the Parsonnet model significantly overpredicted and the MCR model underpredicted mortality. The areas under the ROC curve were as follows: Parsonnet 0.69, EuroSCORE additive 0.74, MCR Bayesian 0.74, UK Bayesian 0.75, and EuroSCORE Bayesian 0.75 (table 1). With the exception of the Parsonnet score, all models performed well in discriminatory power, with the EuroSCORE additive model performing as well as the more complex Bayesian models.

DISCUSSION
Cardiac surgical risk assessment is important to patients, cardiologists, and cardiac surgeons, and should form part of clinical decision making and informed consent. There are many risk stratification models applicable to outcome for coronary artery bypass surgery. Simple additive models offer the possibility of calculating risk at the bedside, or in an outpatient department mentally, or “on the back of an envelope”. More complex risk models may be more accurate for specific small subgroups of patients. Very high risk patients, for example, are better served by the use of full logistic models. The EuroSCORE logistic model, for example, has a risk calculator which can be downloaded from the website (www.euroscore.org) but its complex formula, though easily worked out by computer, cannot be applied at the bedside without one. This may discourage hospitals and units with limited audit and information technology resources from performing risk assessment, to the detriment of clinical decision making. In the current political climate, some form of risk assessment is mandatory, not only for surgical decision and informed consent, but also as a basic standard by which quality monitoring of surgical outcomes may be judged. We have tested various risk models on the National Adult Cardiac Surgery Database and found that more complex models offer little advantage over an effective simple additive system. We recommend the use of the simple additive EuroSCORE model for predicting operative mortality after coronary artery bypass surgery in the UK.

<table>
<thead>
<tr>
<th>Risk model</th>
<th>Area under ROC curve</th>
<th>Standard error</th>
<th>Confidence limits (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parsonnet</td>
<td>0.693</td>
<td>0.012</td>
<td>0.669 0.716</td>
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<tr>
<td>EuroSCORE additive</td>
<td>0.743</td>
<td>0.011</td>
<td>0.721 0.765</td>
</tr>
<tr>
<td>MCR Bayesian</td>
<td>0.740</td>
<td>0.011</td>
<td>0.718 0.761</td>
</tr>
<tr>
<td>UK Bayesian</td>
<td>0.754</td>
<td>0.011</td>
<td>0.733 0.775</td>
</tr>
<tr>
<td>EuroSCORE Bayesian</td>
<td>0.753</td>
<td>0.011</td>
<td>0.731 0.775</td>
</tr>
</tbody>
</table>
A 71 year old woman with progressive dyspnoea and exercise intolerance was found during a transthoracic echocardiography to have a huge mobile mass in the left atrium. Tentative diagnosis of left atrial myxoma was made and the patient was referred to our hospital for further evaluation and treatment.

A transoesophageal echocardiogram (upper panel, left) revealed a solid, round, and homogeneous tumour tendency to prolapse through the mitral valve during diastole. An angio-gram of the right pulmonary artery in the levophase (lower panel, left) showed the left heart structures and the mass (arrowheads). These findings were confirmed by magnetic resonance imaging (below, still frame of a steady state free precession (SSFP) cine sequence in the vertical long axis) (Ao, aorta; LA, left atrium; LV, left ventricle; MV, mitral valve; Myx, myxoma; PV, pulmonary veins; RA, right atrium; RV, right ventricle).

The patient was taken to the operating room for extirpation of the atrial tumour. A solid, round mass with a non-mobile surface was removed (upper and lower panels, right). The patient’s recovery was unremarkable. Anatomo-pathology confirmed the diagnosis of myxoma.

Myxoma is the most common type of primary cardiac tumour, and approximately 85% of myxomas develop in the left atrium.
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*Heart* 2003 89: 98-99
doi: 10.1136/heart.89.1.98

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