Title: A comparison of the cold pressor stress test with a computerised 22 site ECG/ST Mapping system and dipyridamole stress thallium scanning for determining significant coronary artery disease.

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INTRODUCTION.

The diagnosis of coronary artery disease presents a challenge in patients presenting for major non cardiac surgery. The surgical condition may preclude ECG stress testing, and dipyridamole stress thallium scanning[1] or the cold pressor stress test presents an alternative. The standard twelve lead ECG may not elicit subendocardial ischaemia[2] A praecordial grid lead placement may improve the ability of the ECG to detect myocardial ischaemia[3]. We have devised a computerised ECG/ST mapping system which stores a 22 site ECG, consisting of the 6 standard limb leads and 16 praecordial leads[4] and calculates the ST segment from each site during a cold pressor stress test, as well as a repeat 22 site ECG at the end of the test.

METHOD.
Following approval from the local ethical committee 10 patients with a documented history of coronary artery disease and presenting for non cardiac vascular surgery, had all medical therapy stopped for 24 hours and were subject the following day in the morning to a dipyridamole stress thallium test and in the afternoon to a cold pressor stress test with computerised ST data extraction from a 22 site ECG. Blood pressure and pulse were recorded non invasively at 2 minute intervals during the test and the rate pressure product calculated.

RESULTS.
Four patients had normal stress thallium scans, three of these patients however showed significant ST segment depression (> 1 mm) with the cold pressor stress test. In the remaining 6 patients thallium and cold pressor ST maps were correlative.

DISCUSSION.
The cold pressor test provokes coronary artery constriction and tachycardia in patients with coronary artery disease. This may well mimic the haemodynamic stresses that a patient encounters peri-operatively. In this series of patients the 22 site mapping system showed ischaemia with normal thallium scans. This non invasive test may provide a low cost alternative to risk identification in patients with coronary artery disease presenting for major non cardiac surgery and provide a means for providing a risk reduction strategy, as well as optimal ECG lead monitoring perioperatively.

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TITLE: HEMODYNAMIC EFFECTS OF THE PDE INHIBITOR PIROXIMONE TO ASSIST IN WEANING FROM CPB.

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INTRODUCTION: Patients undergoing complicated CABG surgery may require pharmacological support to achieve satisfactory weaning from CPB. Conventional therapy includes inotropes sometimes in combination with vasodilators. We describe the initial results obtained with the PDE inhibitor piroximone (**P**) which has not previously been used following cardiac surgery.

METHODS: Following hospital ethical committee approval and informed consent, patients with a reduced ejection fraction (<50%) who were also all receiving β-blockers and diuretic therapy, undergoing open heart surgery were investigated (currently, n=7). Prior to discontinuing CPB a bolus of 0.5mg.kg^{-1}. **P** was administered over 10 minutes, immediately followed by 6μg.kg^{-1}.min^{-1}. as a continuous infusion, 5 minutes after commencing the infusion weaning from CPB was attempted. Measurements were performed at fixed intervals upto 6 hours after weaning, with a pre-bypass reading as control (C). Statistical analysis was with ANOVA for repeated measures. Mean values ±SD are given and $p<0.05$ taken as significant.

RESULTS: Mean bypass and aortic cross-clamp times were 164±39 and 72±44 mins respectively in the group studied, mean age 56±6years. All patients were successfully weaned at the first attempt and made uneventful recoveries.

Cardiac index (**CI**) increased significantly at all times from C (1.85±.47 lmin^{-1}m^{-2}) with mean increases of between 29% and 57%.

Heart rate (**HR**) increased significantly from pre-bypass C of 57±10beats.min^{-1}. to a maximum of 96±5beats.min^{-1}.

Mean arterial pressure (**MAP**) was unchanged during the study period from a C of 75±8mmHg with a range of values between 63±14 and 86±8 mmHg, not significant at any measurement time.

Central venous and pulmonary capillary wedge pressures (**CVP, PCWP**) were not different between C and after CPB.

Systemic vascular resistance (**SVR**) was significantly reduced at all measurement times after CPB with a minimum decrease of 16% and maximum of 39% from C (1770 dynes.sec^{-1}.cm^{-5}.)

Mean values for pulmonary vascular resistance (**PVR**) were lower than C at all measurement times (11-42%) but only achieved significance at 30, 90 and 120 minutes.

DISCUSSION: **P** has been demonstrated to be an effective agent in facilitating weaning from CPB in a group of patients who had impaired ventricular function pre-operatively. A marked and sustained increase in **CI** was observed combined with a decrease in **SVR** and no significant change in **MAP**. The chronotropic effect noted was statistically significant but mean **HR** was in an acceptable range of 82 and 96 beats.min^{-1}. at all times and no significant arrhythmias were detected. There appeared to be a tendency for **PVR** to be reduced. The results of this open study suggest further investigation of **P** against other agents following cardiac surgery is warranted.