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Choosing the Right Radiocolloid for Breast Sentinel Node Biopsy—A Randomised Comparison of ^{99m}Tc Antimony Trisulphide and ^{99m}Tc Rhenium Sulphur Colloid.

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Introduction: A number of radiotracers and techniques have been proposed in lymphoscintigraphy node mapping to assist with sentinel lymph node biopsy in breast cancer patients with the long-term prospect of avoiding unnecessary regional node dissection. There has been a trend towards different countries adopting a particular radiotracer and technique based on arguments relating to particle size and injection volumes. This study is the first randomised trial of two different techniques used in the women.

Aim: To compare and evaluate the tracer performance of two widely used radiocolloid preparations and injection volumes for lymphoscintigraphy detection in patients with invasive breast cancer.

Methods: A prospective study was performed on 60 women diagnosed with invasive breast cancer requiring axillary node dissection. Lymphoscintigraphy involving peritumoral injection of 0.9ml – 1.2ml filtered ^{99m}Technetium Antimony Sulphide (AS) and 2.4ml - 3.2ml unfiltered ^{99m}Technetium Rhenium Sulphur colloid (SC) on separate days 15 and 90 minutes post injection was performed prior to surgery. Sentinel lymph node biopsy was then performed using a gamma probe and blue dye localisation. The radiotracer used first was randomly assigned.

Results: On lymphoscintigraphy sentinel lymph nodes were identified in 98.3% of low injection volume AS cases and demonstrated a more rapid peak lymph node uptake compared with SC. Larger particle size and injection volume SC lymphoscintigraphy studies demonstrated a SN in 100% of cases. A larger total number of axillary basin lymph nodes were identified on delayed lymphoscintigraphy using SC (179) compared with AS (137). Overall 18/60 (30.0%) of patient SC studies demonstrated IM node radiocolloid uptake compared with 7/60 AS studies (11.6%). No patients demonstrated AS IM uptake only where as 11/60 (18.3%) of SC studies showed IM uptake only.

Conclusion: Contrary to expectation and in spite of slower tracer uptake, the larger particle size unfiltered SC demonstrated a greater number of nodes on lymphoscintigraphy and appears better at identifying IM nodes than AS. This may be due to the larger injection volume used. The clinical relevance of these findings needs further investigation.

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Management of In-Stent Restenosis in the Drug- Eluting Stent Era. OI Omoregbe, M Menon, I Mirza, S Collins, CM Nunn, GP Devlin. Department of Cardiology, Waikato Hospital, Hamilton, New Zealand.

Background: The management of in stent restenosis (ISR) following percutaneous coronary intervention is difficult. Drug–eluting stents (DES) show promise in this clinical setting. We report on the impact of DES on the management of symptomatic ISR at Waikato hospital New Zealand.

Variable	DES (N=31)	Controls (N=49)
Age	63 yrs	61 yrs
Male	79% (22)	60% (29)
DM	19% (6)	16% (8)
Lesion/Stented - length	22mm (± 11.2)	20.1mm (± 7.8)
Vessel size	2.92 mm (± 0.34)	3.0mm (± 0.6)

Methods: Retrospective chart review of patients treated with DES for ISR from 1/7/02 until 30/6/04.Outcomes were compared with historical controls managed percutaneously from 1/7/00 -30/6/02. The primary outcomes was further presentation with symptomatic ISR.

Results: A total of 34 procedures in 31 patients were performed in the DES group compared to 52 in 49 patients in the controls (61% managed with balloon angioplasty, 39% further bare metal stent insertion). The groups were well matched for predictors of restenosis (Table 1). IIbIIIa receptor blockers were administered to 1 in 4 patients in each cohort. At follow-up (median 12.5 months DES v 16.3 months control) one patient in each group had died. Whilst readmission with chest pain was reduced by 30%, it was common in both groups (26%(8) DES v 37% (18) controls (p=ns). A strong trend was however noted towards reduction in symptomatic re-ISR with a 57% relative risk reduction (13%(5) DES v 26% (14) control (p=0.12).

Conclusion: Despite the limitations of small sample size, DES appear to have impacted positively on the management of ISR in clinical practice. However representation to hospital still occurs in 1 in 4 cases with further restenosis noted in 1 in 10 patients.

Suture Versus Staple for Fixation of Mesh in Incisional Hernia Repair—An Experimental Study in Rats. RS Dhillon, RM van Dalen; Waikato Hospital, Hamilton, New Zealand.

The incidence of incisional hernia has been reported to be between 11 and 20% in patients post laparotomy. While some incisional hernias remain asymptomatic, others are associated with pain, and are at risk of hernia incarceration and strangulation. Prosthetic mesh is now commonly used to repair incisional hernias and has been shown to be superior to suture repair techniques in a large prospective multi-centre trial. Despite this, the recurrence rate of primary mesh repair of incisional hernias has been reported to be as high as 38%.

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Mesh migration as a result of inadequate fixation is a commonly cited reason for failure of mesh repair of incisional hernias. The fixation of mesh using either sutures or surgical staples has been studied in mesh repair of inguinal hernias, however the difference in strength of mesh fixation using these two methods has not been established for incisional hernia repair. This experimental study in euthanased rats aims to compare the fixation strength of mesh using sutures and surgical staples.

A midline laparotomy incision was made in twenty euthanased adult male Sprague-Dawley rats. Mesh was placed over the incision with at least 1.5 cm overlap from each incision edge. The mesh was anchored in place at a fixed distance from each incision edge using either four 3.5mm Ethicon staples or four 3/0 interrupted Prolene sutures in each group. A modified 3.5mm Hasson port device with a surgical glove attached to the end was introduced into the abdomen from a lateral abdominal wall puncture. Fluid was infused into the device for measuring the pressure required to disrupt the mesh. The Hasson port was attached to an IVAC syringe pump for infusion and a VT Gas Flow Analyzer via a three way connector, which was attached to a computer interface to measure and graph the pressure required for mesh disruption. The time to place and secure mesh in the suture and staple groups were also recorded.

There was no statistically significant difference ($p=0.83$) in the pressure required to disrupt the mesh between the two groups, 101±12 mmHg in the suture group compared with 102±14 mmHg in the staple group. Staple fixation was 9.7 times faster compared with suture fixation, 291±42 sec for suture versus 30±8 sec for staples ($p<0.001$). In the suture group, 17/20 sutures disrupted laterally and 16/20 in the staple group. The study had a calculated power of 94% assuming 15 mmHg pressure difference at a 5% significance level. This study concludes that the early strength of fixation of mesh for incisional is equal using both sutures and staples however staple fixation is much faster. The reason for early failure of mesh fixation may relate to other factors such as inadequate mesh size, inadequate hernia reduction, patient comorbid factors as well as possible suture and staple “cut out” during movement. Early mesh migration due to inadequate fixation of mesh using either method is probably not the major reason for early failure.

Systolic Murmurs in Adults: Beware the Guidelines! The Waikato Asymptomatic Murmur Study. **R A Fisher, L Rademaker, G P Devlin. Departments of Cardiology and GP Liaison, Waikato Hospital, Hamilton, New Zealand.**

Introduction: In New Zealand, Ministry of Health guidelines, based on established ACC/AHA criteria exist for assessment of asymptomatic systolic murmurs by primary care physicians. They recommend that adults with normal chest X-ray (CXR) and electrocardiogram (ECG) can be reassured without further need for investigation. A large number of these patients are, however, referred for specialist opinion.

The Waikato Asymptomatic Murmur Study assessed the applicability of these guidelines prospectively to patients with systolic murmurs referred for cardiology assessment.

Methods: Asymptomatic adults with a systolic murmur present for longer than one month with normal CXR and ECG were eligible for inclusion. Patients underwent

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echocardiography (echo), with cardiologist review of the study. Studies were categorized as normal, abnormal but not requiring cardiologist clinical review or abnormal requiring cardiologist clinical review.

Results: A total of 253 consecutive patients were referred for a first specialist assessment of an asymptomatic systolic murmur to Waikato hospital from 01-01-01 to 31-10-03. 78/253 (31%) patients fulfilled entry criteria with 77 undergoing echo. The mean patient age was 59 years, with 64% female . 48% (37) had a normal echo, 35% (27) had an abnormal echo but did not require cardiologist review. Findings in this group were predominately mild valve lesions or left ventricular hypertrophy. However, one in six patients (17%,13/71) had findings felt to require cardiologist review, mostly moderate-severe valve lesions. These results were independent of advanced age, gender or ethnicity.

Conclusion: The Waikato Asymptomatic Murmur study suggests that current guidelines for murmur assessment may underestimate the potential for valve disease. In particular normal CXR and ECG cannot confidently exclude important valve disease. Conversely, 83% referred with asymptomatic murmurs could be “triaged” with echo and avoid cardiologist review; an important observation for countries with limited public access to specialist opinion similar to New Zealand.

Honey Stimulates Proliferation of Fibroblasts in an *In Vitro* Model. NR Harcourt, P C Molan. Honey Research Unit, University of Waikato, Hamilton, New Zealand.

Clinical trials have shown that honey is an effective broad-spectrum antibacterial agent that has no adverse effects on wound tissues, and also provides anti-inflammatory activity which minimizes hypertrophic scarring. Honey may offer significant advantages to other available treatments for the management of scarring in wound healing. This is an analysis of a laboratory study conducted to examine the effectiveness of honey on stimulating proliferation of a fibroblast culture *in vitro* culture. Fibroblasts from the Swiss 3T3-L1 cell-line were incubated with diluted honey (0.25%) from two different floral sources and an artificial honey solution for 48 h. The cell density of fibroblast cultures was then determined by the 3 (4,5-dimethylthiazolyl-2)-2,5-diphenyl tetrazolium bromide (MTT) assay. It showed that exposure of cultures to natural honeys (0.25%) increased proliferation levels above those obtained for cultures exposed to culture medium alone. Artificial honey at the same concentration had no effect on proliferation, indicating that sugars alone in honey could not account for stimulation. Manuka honey only had a stimulatory effect on fibroblast proliferation in a 0.25% v/v solution, and not outside of this optimal concentration.

The Profile of Diabetic Patients in a Rural Town in New Zealand and the Extent of Aspirin Use. G Joshy, M Devers, D Simmons, Waikato Clinical School, University of Auckland, Hamilton, New Zealand.

Background: The risk of a cardiovascular event in those with diabetes has been shown to be as high as those post myocardial infarction. Aspirin is of major benefit in the prevention of cardiovascular disease (CVD) in those with diabetes. There is

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disagreement over the use of aspirin in diabetes to those with a 15% risk calculated on the Framingham data, to those who recommend use in all of those with diabetes aged over 40 years. The aim of this study was to assess aspirin use among those with diabetes.

Methods: The Waikato DHB has introduced a new, integrated approach for diabetes services management in one rural area in New Zealand. Data has been linked from multiple data sources including the "Get Checked" database and the Waikato Regional Diabetes Service database. As part of this program, data on aspirin use has been collected through a mail survey starting from March 2004.

Results: All 365 people with diabetes were invited to participate. Non response 132 (36%), no consent 17 (5%), returned mail 19 (5%). Among 180 (49%) people with diabetes who participated in the survey to date, 5 were aged below 40, mean age 64.8 years (12.3), 45.6% male. European 66%, Maori 31%. 107 patients had year of diagnosis in their medical records. Age at diagnosis mean(sd) of 56.1 (12.1), duration of diabetes 9.1 (7.1). Europeans were diagnosed about 8 years later than Maori. Metabolic and other clinical data is still being collected. Most patients (91%) were registered with the Waikato Regional Diabetes Service database. Only 56% had annual review under Get Checked program (64% Europeans and 50% Maori). Among respondents, 46.9% of patients aged above 40 use aspirin including 49.5% Europeans and 41.6% Maori. Only 3% use 300mg and 30.9% use 100mg or lesser. Among the 166 patients who had the clinical data to calculate cardiovascular risk (CVR), 45 (27.1%) had >15% CVR. Only 19 (42.2%) of the high risk patients were taking aspirin. But 59 (48.7%) of the low-risk patients were taking aspirin. There was no significant association between aspirin intake and CVR. (Chi-square test, p=0.4531).

Conclusion: We conclude that the aspirin usage in diabetes is not in relation to CVR.

All diabetes patients	365
Participated in survey	180 (100%)
Patients with Get Checked annual review	101 (56.1%)
- Europeans	72/113 (64%)
- Maori	27/54 (50%)
Patients aged ≥40, using aspirin	78/166 (46.9%)
- Europeans	52/105 (49.5%)
- Maori	20/48 (41.6%)
CVR≥15%	45/166 (27.1%)
Aspirin usage among CVR≥15%	19/45 (42.2%)
Aspirin usage among CVR<15%	59/121 (48.7%)

Diagnosis of Pulmonary Embolism: CTPA as a Stand-alone Investigation.

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Objectives: To test the clinical outcome accuracy of a negative CTPA as a stand alone investigation to exclude Pulmonary Embolism.

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Materials and Methods: 535 consecutive patients (Emergency Department and Hospital in patients) who had CTPA (Single Slice, GE Helical Scan) were recruited **prospectively** from March 2003 to September 2004. 48 patients were excluded from the study for incomplete data (12) or had a lower limb ultrasound examination subsequent to a negative CTPA (36). Hence the study population was 487 patients. Each CTPA examination was read by two consultant radiologists independently. A 3 month post CTPA follow up was done in all patients by telephone interview, interview with General Practitioners and hospital records to establish the clinical outcome accuracy of a negative CTPA.

Results: There were 383 (78.6%) negative and 104 (21.4%) positive CTPA examinations. Among those with a negative CTPA, 2 patients had DVT and 343 patients had no evidence of an episode of venous thromboembolism or pulmonary embolism. At 3 month follow up, 38 patients died within the three month follow up period and one patient's death was attributed to suspected PE. All patients with positive CTPA were treated with anticoagulation.

The negative predictive value is 99.1% (95% CI 97.5% - 99.7%)

Conclusion: A single slice helical negative CTPA examination excludes clinically significant PE. No further additional imaging examination such as lower limb ultrasound is unnecessary.

Mechano-Growth Factor (MGF) Stimulates Expression and Secretion of Brain Natriuretic Peptide (BNP) and Improves Ejection Fraction after Myocardial Infarct. **V Carpenter, GP Devlin,[2] KG Matthews,[1] J Jensen,[2] SP Stuart,[1] PH Goldspink,[4] SY Yang,[3] JV Conaglen,[2] JJ Bass,[1] G Goldspink,[3] CD McMahon.[1] 1:AgResearch Ltd, Hamilton, New Zealand; 2:Waikato Clinical School, University of Auckland, Hamilton, New Zealand; 3:Royal Free and University College Medical School, London, UK; 4:University of Illinois (Chicago), USA.**

Concentrations of BNP are acutely increased after myocardial infarction (MI) and are believed to protect the infarcted heart. The stimulus for secretion of BNP is not known, but expression is induced by mechanical stretch. Interestingly, expression of MGF, a splice-variant of IGF-I, is also induced by mechanical stretch. We have previously shown that MGF improves the ventricular ejection fraction after MI. Therefore, we hypothesise that MGF induces expression and secretion of BNP, which, in turn, improves cardiac performance.

In experiment 1, MI was induced by occluding the left circumflex coronary artery of sheep. Ewes received one of four protein treatments (n=6 per group) delivered into the circumflex artery: vehicle (saline), 200 nM mature IGF-I, 200 nM MGF E domain, or 200 nM of full MGF (domains B, C, A and D of mature IGF-I plus the E domain of MGF). Left ventricular function was assessed with echocardiography before MI (baseline), and at days 1, 2 and 6 post-MI. Blood samples were collected at days 0, 1, 2, and 6 for assay of BNP. In experiment 2, H9C2 rat cardiomyocytes were treated with 100 and 300 ng of MGF for 30, 60, 120 and 180 min. After treatment, mRNA was extracted and reverse transcribed. RT-PCR was used to semi-quantify expression of BNP.

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Cardiac ejection fraction was reduced by 40% (P<0.001) at d 1 in all sheep, but was increased by 4% at d 6 only in sheep treated with MGF peptide (E or full peptide; at least P<0.05). Concentrations of BNP were increased in ewes treated with the E domain of MGF (P<0.05). Furthermore, BNP mRNA was increased after 30 min compared with controls. We speculate that the E domain of MGF, but not mature IGF-I, stimulates expression and secretion of BNP, which, in turn, acts to improve the ejection fraction after MI.

Procalcitonin—A Valuable Diagnostic Marker in Meningococcal Disease.

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Background: Some patients with meningococcal disease (MCD) seeking medical attention create a diagnostic dilemma for clinicians due to the non-specific nature of their presentation. We have assessed the diagnostic accuracy of procalcitonin within the emergency department (ED), to clarify its role in the evaluation of MCD.

Methods: Two overlapping cohorts have been studied. Procalcitonin levels were measured in a cohort of patients with confirmed MCD diagnosed within the current New Zealand serogroup B epidemic, to assess the sensitivity of procalcitonin. In the second cohort, a large consecutively recruited ED population of febrile patients, enabled specificity and likelihood ratios of procalcitonin to be evaluated.

Results: There were 193 patients in the MCD cohort (92 children, 101 adults). The procalcitonin geometric mean was 10.9ng/ml with higher childhood than adult values (22.9ng/ml vs 5.5ng/mL, p=0.01). The overall sensitivity of procalcitonin, using a 2.0ng/ml cut-off in children and 0.5ng/ml for adults, was 94% (95% CI 89-97%). Despite the higher paediatric cut-off, a trend towards greater procalcitonin sensitivity existed in children (96% vs 92%, p=0.30). Procalcitonin was correlated with whole blood meningococcal load (r=0.50) and Glasgow Meningococcal Septicaemia Prognostic Score (r=0.40). Within the cohort of 1521 febrile ED presentations, 28 patients were confirmed to have MCD. We showed a procalcitonin specificity in MCD of 85% (95% CI 83-87%), positive and negative likelihood ratios of 6.1 and 0.08, and corroborated the sensitivity of procalcitonin (93%; 95% CI 76-99%).

Conclusions: Procalcitonin can provide an important tool in the diagnosis of patients with MCD who present with non-specific febrile illnesses. The diagnostic accuracy surpasses current early laboratory markers and can be used to guide patient management decisions.

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