Welcome

Welcome to the 49th Annual Scientific Meeting.

Today we have 24 ten minute oral presentations, 10 short oral presentations and 25 posters scheduled. It will be appreciated if you are ready for your presentation on time and are prepared to keep within the time limit. Please make sure your poster has been displayed, and don’t forget to pick it up again after the meeting. Posters will be displayed in the atrium, the lunch room and within the seminar room itself.

Before we start, please make sure you have registered with Jane at the registration desk just outside in the atrium. Whilst you are in the atrium, please do not make any loud noise as there are people working in open offices upstairs and around you.

If you need to use a phone, there is a room provided off of the lunch room, aptly signed “Phone Call Room”. Otherwise you can make your calls outside but you will need to be let back in.

Tea, percolated coffee and water will be available all day in the lunch room, which is where morning tea, lunch and afternoon tea will be held.

Please make sure you have let Jane at the registration desk know by afternoon tea if you need to organise taxis, if you haven’t already. However, we do recommend that you use the taxi rank at the QEH as that has proved to be the most efficient way. If you have any changes to your presentation, or any other needs, please see Sue, Wendy or Jane.

Smoking is not permitted within the property, including outdoor areas such as the car park.

There is no onsite all day visitor parking at the BHI. Attendees will have to park at the Queen Elizabeth Hospital car park across the road. The cost for the day is approximately $13.00.

We hope you have an enjoyable and productive day.

Organised by:
Surgical Research Society
Outgoing President: Professor John McCall
Incoming President: Professor Leigh Delbridge
Convenor: Professor Guy Maddern
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Program
Surgical Research Society 49th Annual Meeting 2012
Friday 9 November 2012
Basil Hetzel Institute, Queen Elizabeth Hospital
Convenor: Professor Guy Maddern

08:30 Registration, Opening and Welcome
Professor Guy Maddern

09:00 Session 1
Chair, Mr Richard Hanney

Oral Presentations
1 Jocelyn Burke 6 Deborah Wright
2 Arjun Iyer 7 Loretta Radford
3 Gil Stynes 8 Sanket Srinivasa
4 Justin Gundara 9 David Westwood
5 James Lee

10:30 Morning Tea

11:00 Session 2
Chair, Professor Leigh Delbridge

Guest Speaker - AAS Visitor
Associate Professor Heitham Hassoun
Medical Director - Global Services
Johns Hopkins Medicine International, Baltimore, Maryland, USA
Kidney-Lung Crosstalk during Surgical AKI

11:30 Oral Presentations
10 Patsy Soon 13 Cheng Yee Chan
11 Chris Delaney 14 Wenjie Zhong
12 Adam Frankel 15 David Oehme

12:30 Lunch and Poster Display
Jepson Lecture - Professor John Windsor
Professor of Surgery, Director of Surgical Research
The University of Auckland, New Zealand
Streams in the Desert

2:00

Session 3
Chair, Professor Paul Norman

Oral Presentations
16 Alice Guidera
17 Julian Ip
18 Sam Adie
19 Wendy Yu
20 Tiong Cheng Sia
21 Robert Pearce
22 Omid Ahmadi
23 Daniel Lemanu
24 Joris Broeders

3:30

Afternoon Tea

3:50

Session 4
Chair, Professor Stan Sidhu

Short Oral Presentations
25 Jingyi Cao
26 Leong Ung Tiong
27 Naseem Mirbagheri
28 Alexander Cameron
29 Kheng-Seong Ng
30 Ryash Vather
31 Yee Ian Yik
32 Taina Lee
33 Kenneth Sun
34 Sara Murray

5:05

Short break

5:15

Presentation of Young Investigator Award, DCAS Award, Travel Grants and Best Poster Award

5:30

Summary and Close
Biographies

Associate Professor Heitham Hassoun

Heitham Hassoun, M.D., F.A.C.S.
Medical Director, Global Services
Johns Hopkins Medicine International

Dr. Heitham Hassoun is currently the Medical Director for the Global Services division of Johns Hopkins Medicine International (JHI). Prior to JHI, Dr. Hassoun also served as a Medical Director for Methodist International (MI), where he directed clinical and educational activities at MI affiliates and partners in Europe-Middle East-Africa. He also was an Associate Professor of Cardiovascular Surgery in the Methodist DeBakey Heart & Vascular Center and the Director of Basic & Translational Science Research in the Division of Acute Care Surgery & Surgical Critical Care at The Methodist Hospital Research Institute in Houston, Texas.

He began his academic career as an Assistant Professor in the Department of Surgery at The Johns Hopkins Hospital in Baltimore, MD where he obtained the National Heart, Lung and Blood Institute (NHLBI)/American Vascular Association (AVA) Lifeline KO8 award for the investigation of kidney-lung interactions during ischemia-reperfusion injury. Dr. Hassoun has a particular interest in knowledge transfer and the globalization of healthcare, and was instrumental in developing clinical programs at global affiliates of Johns Hopkins Medicine International where he also served as Chief of Surgery & Director of Vascular Intervventional Therapy at Tawam Hospital in Al Ain, Abu Dhabi, UAE.

Dr. Hassoun maintains Board Certification with the American Board of Surgery, possessing a certificate in both General and Vascular Surgery. He is also a reviewer for several medical and scientific journals, and serves as a member of the editorial board for the Journal of Surgical Research. Dr. Hassoun has been the recipient of numerous other awards and honors, including the Young Investigator Award from the American Motility Society, the Award for Outstanding Medical and Scientific Research in Functional Genomics from the National Institute of Health (NIH), and an Arab Health Award for Advances in Cardiovascular Intervventional Therapy at the Arab Health Congress in Dubai, UAE in 2008.
Professor John Windsor

John Windsor, MBCHB, FRACS
Professor of Surgery
Director of Surgical Research
The University of Auckland

Professor John Windsor is a surgeon who holds a personal chair in Surgery at the University of Auckland, and is Director of Surgical Research. He founded the Pancreas Research Group (1992), Surgical Skills Centre (1993), HPB/UGI Unit (1994), Surgical Research Network (2007) which now encompasses ASML (Applied Surgery and Metabolism Laboratory) and SCORE (Surgical Centre for Outcomes Research and Evaluation).

Surgical interests include the management of acute and chronic pancreatitis, pancreatic cancer, and gastro-oesophageal reflux and malignancy. His current research includes the role of toxic mesenteric lymph in the promotion of multiple organ failure, the investigation of specific mitochondrial therapies to restore cellular bioenergetics, the mapping and modulation of gastric electrical activity and the development of medical devices.

Over the last 5 years he has published 80 of 204 manuscripts, raised $6m in grants and given over 100 invited talks, including Visiting Professorships to Harvard, Oxford, Karolinska, Singapore, Capetown, Johannesburg and Delhi.

He is co-founder and a director of the start-up SIMTICS Ltd that has developed the 'Integrated Cognitive Simulator' for procedural and surgical skills training. Awarded the Butland Distinguished Medical Science Award (1997), Butland Award for Excellence in Research Supervision (2009), Tertiary Teaching Excellence Award (2009) Gluckman Medal (2012) from the University of Auckland and elected as an Honorary Fellow of the American Surgical Association (2012).

In the RACS he was involved in the development of the CLEAR, Surgeons as Teachers, DCAS courses and the Academy Surgical Educators and is currently Chairperson of the Section of Academic Surgery. He completed a 4 year term as Secretary General of International Hepato-Pancreato-Biliary Association in 2012.

Recent appointments include Chairperson of the national HPB/Upper GI Tumour Stream, member of the Clinical Advisory Board of Health Innovation NZ, and Patron TEDx Auckland.
Maps

Adelaide Airport to Basil Hetzel Institute, via Holbrooks Rd, approx. 7.5km

A: Adelaide Airport
B: Stamford Grand Hotel
C: Basil Hetzel Institute

(Stamford Grand to Basil Hetzel Institute, via Tappleys Hill Road, approx. 15km)
North Terrace, Adelaide, to Basil Hetzel Institute, Woodville. Approximately 9km via Port Road.
The Basil Hetzel Institute

The Basil Hetzel Institute for Translational Health Research is the productive research arm of The Queen Elizabeth Hospital. The Institute, a $19 million purpose-built research facility, was opened in March 2009 and is located on Woodville Road opposite the main campus of The Queen Elizabeth Hospital. It is located 15 minutes from the Adelaide CBD in the city’s western suburbs.

All research departments have strong links to the clinical divisions within the Hospital underpinning The Institute’s overarching focus on translational health research. This ‘bench to bedside’ approach is at the forefront of an emerging area of medical science that aims to improve public health through collaborative discoveries and innovations in patient care, education and research.

Research conducted by The Institute covers a broad spectrum, exploring causes, potential improvements in therapeutic outcomes and the prevention of some of the most serious and common health conditions facing our community today. These include cancer, cardiovascular disease, arthritis, kidney disease, diabetes, respiratory diseases and stroke.

The Institute also has long-standing teaching and research affiliations with the University of Adelaide, the University of South Australia and Flinders University, which offer a range of undergraduate and postgraduate research training opportunities. Several academic departments, including the University of Adelaide Disciplines of Surgery, Medicine and Psychiatry, are based at the Hospital.
Oral Presentations
**MK-2206, a Novel Akt Inhibitor, Suppresses Medullary Thyroid Cancer Proliferation**

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**Introduction**
Development of targeted therapies for medullary thyroid cancer (MTC) has focused on inhibition of the RET proto-oncogene with minimal success. Akt is a downstream target of RET via the key mediator phosphoinositide-3-kinase. Targeting Akt in MTC may thus be more effective for anti-tumor treatments. MK-2206 is an orally administered allosteric Akt inhibitor that exhibited minimal toxicity in phase 1 trials. We therefore explored the anti-tumor effects of this novel compound in MTC.

**Methods**
Human MTC-TT cells were treated with MK-2206 (0-20 μM) for 2, 4, and 6 days. Assays for cell viability were performed at each time point with MTT. Western blot analysis was performed on protein lysates from TT cells treated with MK-2206 (0-10 μM) for 4 days to assess mechanism of action, mechanism of growth inhibition, and production of neuroendocrine tumor markers.

**Results**
MK-2206 suppressed MTC cell proliferation in a dose-dependent manner (p≤0.02). Levels of Akt phosphorylated at serine residue 473 declined with increasing doses of MK-2206, indicating successful Akt inhibition. The apoptotic proteins cleaved PARP and cleaved caspase 3 increased in a dose-dependent manner with MK-2206, while surviving, an apoptosis inhibitor, was markedly reduced. Importantly, the anti-tumor effects of MK-2206 were independent of RET, as the levels of RET protein were not blocked.

**Conclusion**
The Akt inhibitor MK-2206 significantly suppresses MTC proliferation independent of RET modulation. Given the high oral bioavailability and low toxicity profile, Phase II studies with this drug alone or in combination with RET inhibitors are warranted.
Cardiac Transplantation using hearts from Donation after Circulatory Death (DCD) Donors – a viable source of organs?


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Introduction
Use of DCD donors for heart transplantation is limited by fear of warm ischaemic damage. We aim to investigate the impact of varying periods of warm ischaemia (WI) on cardiac function, and evaluate pharmacological post-conditioning strategies to limit ischaemic injury.

Methods
In a porcine DCD model, 3 warm ischaemic times (WIT) were evaluated (table). Hearts were flushed with Celsior post warm ischaemia. Pharmacological post-conditioning was instituted through supplementation of Celsior (table). Hearts were explanted onto an isolated working heart circuit & performance was assessed for 4 hours - functional (Cardiac Output, Coronary Flow), metabolic (pH, lactate, myocardial oxygen consumption), and parameters of myocardial injury (troponin, LDH) were evaluated.

Results
Compared to control hearts, Group 1 showed complete functional recovery, Group 2 partial recovery and Group 3 minimal recovery. Group 2 remained more acidotic (p=0.03), had higher lactate levels (p=0.03) and troponin release (p=0.03) than Group 1. Following supplementation (Group 2S), there was improved recovery (c/w group 2), with superior CO (p <0.01), higher coronary flows (p <0.01), decreased troponin release (p=0.05), less oedema (p=0.03), all comparable to control hearts levels. Improvement also occurred between group 3 and 3S, however recovery remained inferior to control hearts.

Conclusions
Hearts with a WIT of ≤ 20 minutes demonstrate excellent recovery. Detrimental effects of WI become evident beyond 20 minutes - here, pharmacological post-conditioning strategies significantly improved cardiac recovery. Utilising such strategies in maintaining good cardiac function following 30 minutes WIT, DCD hearts can provide a viable source of organs for cardiac transplantation, warranting further investigation.
The Creation of a Functional Interface between Biomaterials & Skin.

Stynes GD¹,², McLean KM³, Kiroff GKK⁴, Morrison WA², Kirkland MA⁵

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Introduction
Currently, biomaterials such as intravenous lines, catheters, or devices that breach skin eventually become infected. To create a permanent & functional interface between biomaterials & skin, we aimed to create a structure with optimised chemical & physical properties to enable permanent skin attachment.

Methods
A torous-shaped polymer was melt bonded to a tantalum scaffold. Collagen was covalently bonded to this structure. 24 such structures were then implanted into pigs with the assistance of negative pressure wound dressings and left in situ for one month. Explanted specimens were then sectioned with a diamond saw and the degree of dermal and epidermal attachment assessed with light microscopy.

Results
Excellent dermal integration into scaffolds was achieved. Epidermal attachment was evident in specimens inserted at full skin thickness in optimized conditions.

Conclusions
With optimised conditions & the assistance of negative pressure wound dressings, a functional interface between skin & biomaterials was achieved. Dermal integration was excellent. Epidermal attachment was evident in optimal conditions. It is likely that the fundamental principles of our design will enable future integration of biomaterials into human skin, enabling infection-free access to blood vessels, body cavities, implantable robotics & prosthetics, & the reconstruction of surgical defects with biomaterials.

Acknowledgements
KCI Medical Australia for their support in providing V.A.C. ATS® Therapy Units & V.A.C.® Dressings for this study
Professor Michael Morykwas, for advice regarding appropriate dressings for pig studies.
Ben McMurtrie & Rob from Geelong Orthotics, for design & construction of rigid polyethylene shells for protection of pig dressings.
Dr Thomas Gengenbach, CSIRO Melbourne, for XPS analysis.
Dr Paul Pasic, CSIRO Melbourne, for help with vacuum plasma equipment.
Institute for Frontier Materials, Deakin University, Victoria, Australia, for access to laboratories for initial vacuum plasma reactor work.
Dr Cynthia Wong and Ms Melinda Tursky, Barwon Biomedical Research, The Geelong Hospital, Victoria, Australia, for assistance with ELISA.
MicroRNA-9* targets ATG5 to block autophagy and induce cell death in medullary thyroid carcinoma

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Introduction
Medullary thyroid carcinoma (MTC) contributes disproportionately to thyroid cancer related mortality and management options beyond surgery remain limited. miR-9* reduces MTC cellular proliferation in vitro; an effect possibly mediated through altered autophagic flux.

Methods
TT cells were reverse transfected with miR-9* and the effect on markers of autophagy examined at 48h. Untransfected cells were treated with an autophagy inducer (rapamycin) or inhibitor (3-methyladenine) and the effect on miR-9* quantified at 48h. Combined experiments involved reverse miR-9* transfection for 48h, followed by treatment with rapamycin or 3-MA for 24h to examine changes in autophagic flux and cell viability. Additionally, RNA was extracted from 20 fresh frozen MTC tumours and qPCR was performed to quantify autophagy marker mRNA expression; comparing sporadic (n=13) to hereditary cases of disease (n=7) and associations with clinical outcome.

Results
miR-9* transfection reduced TT cell viability (P<.05) in association with immunoblotting evidence of autophagy inhibition and significantly reduced Atg5 mRNA expression (P<.01). Rapamycin autophagy induction resulted in elevated miR-9* expression (P<.01). Reduced cell viability was enhanced further when miR-9* transfected cells were challenged with rapamycin autophagy induction. Lastly, Beclin-1 expression was significantly elevated in sporadic versus hereditary cases of MTC and correlated with residual disease (P<.05).

Conclusions
miR-9* inhibits autophagy, sensitises cells to rapamycin treatment and reduces MTC cell viability through miR-9* inhibition of Atg5. Beclin-1 is elevated in sporadic cases and is a negative prognostic indicator. Taken together, these findings suggest that elevated autophagic flux is a tumour survival strategy that can be disarmed through miR-9* suppression of Atg5.
MicroRNAs – A step towards personalized management of papillary thyroid cancer

Lee J1,2,3, Zhao J1,3, Gundara J1,2,3,4, Ip J1,2,3, Gill A1,3,4,5, Sywak M2,3, Delbridge L2,3, Sidhu S1,2,3

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Introduction
Thirty per cent of papillary thyroid cancer (PTC) patients suffer recurrence after adequate initial treatment. We aimed to establish tissue and plasma miRNAs as molecular markers for tumour aggressiveness and recurrence. These biomarkers will enable personalising the management of PTC in the clinical setting.

Methods
MicroRNA expression from tumour and plasma samples of patients with varying degrees of aggressiveness were measured and compared, using microarray and qRT-PCR. The tissue miRNA expression was also correlated to tissue BRAF mutation, while plasma miRNA expression was re-measured after resection of the tumour. Non-parametric and univariate regression tests were used where appropriate.

Results
Tissue expression of miR-222 was significantly elevated in the aggressive-PTC patients (Fold-change=10, p=0.047), while miR-221, -222 and -146b over-expression all correlated to BRAF mutation (p<0.042). Plasma expression of miR-222 and -146b were significantly elevated in the presence of extrathyroidal extension (p<0.01). Four miRNAs (miR-221, -222, -146b and -21) showed significant reduction in their plasma expression post removal of the tumour (p<0.01).

Conclusions
We have demonstrated that over-expression of miR-222, both in the tissue and plasma, is consistently associated with aggressive behaviour of PTC, such as metastasis on presentation, recurrence or extrathyroidal extension. It was also a better discriminator of aggressiveness than BRAF mutation in our cohort. We have also demonstrated that reduction in plasma miRNA expression corresponded to removal of the tumour. These biomarkers can be applied clinically to select patients with aggressive PTC for more aggressive treatment or closer surveillance, as well as detect recurrence of PTC.
Calcium supplements and cardiovascular risk: A subgroup analysis

Radford LT, Gamble GD, Grey A, Bolland MJ, Reid IR

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Background
Calcium supplements have been reported to increase the risk of myocardial infarction. We wished to determine whether the effects of calcium supplements on cardiovascular risk vary across different population groups.

Methods
We modelled the effect of calcium (with or without vitamin D) on the time to incident cardiovascular events in pre-specified subgroups for age, dietary calcium intake, body mass index (BMI), smoking history, history of hypertension, diabetes, and previous cardiovascular disease, using interaction terms in Cox proportional hazards models in two datasets - our re-analysis of the Women’s Health Initiative Calcium and Vitamin D study (WHI CaD), and our pooled patient-level meta-analysis of trials of calcium supplements with or without vitamin D.

Results
For women in WHI CaD not taking calcium supplements at randomization (n=16718), we found no significant interactions between treatment allocation, the risk of myocardial infarction, stroke, or coronary revascularization, and any of the baseline variables. In the pooled patient level dataset of six trials of calcium with or without vitamin D (n=24869), there were also no significant interactions between treatment allocation, risk of myocardial infarction or stroke, and any of the baseline variables.

Conclusions
We found no evidence that the increased cardiovascular risk from calcium supplements differs across varying patient populations.
**Faecal microRNA abundance; Towards a better stool test**

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**Introduction**

The immunological faecal occult blood test is 61% sensitive and 95.1% specific for the detection of significant colorectal neoplasia; it has no ability to distinguish between advanced adenoma, invasive cancer or other causes of lower GI bleeding.¹ A non-invasive screening test with improved sensitivity and specificity for significant colorectal neoplasia would reduce the number of missed asymptomatic lesions and the cost and side effects of negative colonoscopy.

MicroRNAs may be used in such a test; they are differentially expressed in colonic health and disease, are very stable, and can be purified from human faeces² but are highly conserved between species. We will investigate impact of diet on faecal microRNA abundance and the utility of microRNA analysis for the detection of colonic pathology.

**Methods**

Healthy volunteers were recruited; they donated faecal samples while following an omnivorous then a vegan diet. Patients undergoing colonoscopy were recruited; those with a normal colon, adenomas, adenocarcinoma or inflammatory bowel disease donated faecal samples. Faecal RNA was purified; plant and animal derived microRNA abundance was determined.

**Results**

Microarray analysis elucidated differential microRNA abundance in healthy subjects following a vegan versus omnivorous diet. Analysis of faecal microRNA abundance in health and disease is underway.

**Conclusions**

Faecal microRNA abundance alters with diet. This must be considered when developing tests that use faecal microRNAs as biomarkers of disease.

It was recently demonstrated that dietary plant microRNAs might influence human gene expression.³ We speculate that interaction between differential faecal microRNA abundance and the GI tract may contribute to the impact of diet on bowel disease risk.
References


Randomised clinical trial of goal-directed fluid therapy in elective colectomy within an Enhanced Recovery protocol

Srinivasa S, Taylor MHG, Singh P, Yu TC, Soop M, Hill AG

Department of Surgery, South Auckland Clinical School, Middlemore Hospital, University of Auckland

Introduction
Recent studies in colorectal surgery have demonstrated improvements in surgical outcomes either by restricting fluid administration or individualising fluid management—so called Goal-directed fluid therapy (GDFT). However, there has been no evaluation of GDFT within an established Enhanced Recovery (ERAS) protocol incorporating fluid restriction—another competing proposed best-practice. Thus, a study was conducted to evaluate the role of GDFT in patients undergoing elective colectomy within an established ERAS protocol incorporating fluid restriction.

Methods
A randomized, blinded trial was conducted in consecutive patients undergoing elective colectomy within an established ERAS protocol. All patients received fluid restriction and were randomized to GDFT or no GDFT. The primary outcome of the study was a composite surgical recovery score, which has been shown to correlate with complications. Secondary outcomes included clinical outcomes, physiological measures of recovery and serum markers.

Results
Eighty-five patients were randomized and following exclusions, there were 37 patients in each arm. The patients were well matched at baseline. Patients in the GDFT arm received more colloid (Mean: 591mL vs. 297mL) intraoperatively and had superior cardiac indices. However, no differences were observed between the groups with regards to surgical recovery or other physiological measures of recovery. No differences were observed with regards to serum electrolytes, vasoactive hormones or cytokines, administered fluid amounts outside of the intraoperative period, length of stay or complications.

Conclusion
GDFT did not provide any clinically significant benefits in patients undergoing elective colectomy within an ERAS protocol incorporating fluid restriction.
Adaptive resistance to hypoxia-inducible apoptosis in colorectal cancer cells is mediated by HIF-1α-dependent gastrin gene expression

Westwood DA, Patel O, Shulkes A, Baldwin GS

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Introduction
Understanding the molecular processes mediating colorectal cancer (CRC) tumorigenesis will enable the development of targeted therapies that selectively disrupt the pathways responsible for tumour growth. The gastrin family of growth factors promote CRC growth, invasion and angiogenesis. Hypoxic microenvironments, caused by tumours outgrowing their local blood supply, stimulate aggressive tumour behaviour. However, the effect of hypoxia on gastrin expression in CRC is unknown.

Methods
Understanding the molecular processes mediating colorectal cancer (CRC) tumorigenesis will enable the development of targeted therapies that selectively disrupt the pathways responsible for tumour growth. The gastrin family of growth factors promote CRC growth, invasion and angiogenesis. Hypoxic microenvironments, caused by tumours outgrowing their local blood supply, stimulate aggressive tumour behaviour. However, the effect of hypoxia on gastrin expression in CRC is unknown.

Results
Gastrin gene expression in CRC cells is stimulated by hypoxia by binding of HIF-1α to the gastrin promoter. The viability of gastrin knockdown CRC cells in vitro is diminished under hypoxic (1% O₂) conditions due to loss of resistance against hypoxia-inducible apoptosis. The growth of tumour xenografts in mice exposed to hypoxia (10% O₂) for 21 days is significantly reduced by knocking down gastrin expression.

Conclusions
This work provides evidence that gastrin expression is involved in the adaptation of CRCs to hypoxic microenvironments through resistance to apoptosis. Shrinkage of CRC liver metastases by the angiogenesis inhibitor bevacizumab is dependent on hypoxia-induced apoptosis. Therapies that target gastrin may enhance the therapeutic efficacy of bevacizumab and increase secondary resectability rates in patients with CRC liver metastases.
Breast cancer-associated fibroblasts induce epithelial-to-mesenchymal transition in MCF7 cells

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Introduction
Epithelial-to-mesenchymal transition (EMT) is thought to underlie tumour progression and metastasis. Cancer-associated fibroblasts (CAF\textsc{s}) are believed to play a key role in the growth and migration of epithelial cancer cells. The aim of this project was to determine if breast CAF\textsc{s} are able to induce EMT in epithelial cancer cells compared to surrounding normal breast fibroblasts (NBF\textsc{s}).

Methods
Five matched pairs of CAF and NBF primary cultures were established from fresh human breast cancer specimens and characterised by chemokine (C-X-C motif) ligand 12 (CXCL12) secretion (ELISA) and \(\alpha\)-smooth muscle actin (\(\alpha\)-SMA) expression (immunoblotting). \(\gamma\)H2AX expression by immunoblotting in response to 0, 0.25 and 0.5 µM doxorubicin for 3 days was also assessed. Co-culture of CAF\textsc{s} and NBF\textsc{s} with MCF7 breast cancer cells was performed for 10 days. The MCF7 cells were then assessed for vimentin and E-cadherin by immunofluorescence and immunoblotting. Invasion assays were also performed on co-cultured MCF7 cells.

Results
CAF cultures differed from NBF\textsc{s} in terms of greater CXCL12 secretion, higher \(\alpha\)-SMA expression and greater resistance to doxorubicin-induced DNA damage. MCF7 cells co-cultured with CAF\textsc{s} showed greater levels of vimentin and lower E-cadherin. MCF7 cells co-cultured with CAF\textsc{s} also showed greater invasiveness compared to cells co-cultured with NBF\textsc{s}.

Conclusion
Breast CAF\textsc{s} are able to induce EMT in MCF7 epithelial cancer cells to a greater degree than NBF\textsc{s}. This implies that CAF\textsc{s} are able to induce a more malignant phenotype in epithelial cancer cells.

Acknowledgements
Funding by NHMRC, NSW Cancer Institute and Beryl Stevens Bequest Fund.
Circulating markers of metabolic change associated with bariatric surgery

Chan CY, Jones GT, van Rij AM

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Introduction
Obese patients who undergo gastric bypass surgery experience metabolic changes resulting in appetite loss and disappearance of type II diabetes, even before weight loss occurs. The underlying biological mechanisms are not well-understood.

MicroRNAs are a newly-discovered class of regulatory molecules, which have been shown to modulate potentially-related processes such as lipid metabolism and insulin regulation. This study aimed to determine if patients’ circulating microRNA profiles were specifically altered following bariatric surgery.

Methods
All known human microRNAs (totalling 1733) were measured in plasma using microarrays (Affymetrix) in ten obese patients undergoing gastric bypass surgery, and ten patients undergoing non-bariatric surgery, at baseline, 5 days, and 6 weeks post-operatively. Inter-group comparative analysis of differentially-expressed microRNAs was performed using the Qlucore Omics Explorer software package.

Results
Forty-one microRNAs were differentially expressed in the bariatric group at 6 weeks compared to baseline, compared to thirteen in the non-bariatric group; microRNAs between groups were mutually exclusive. The bariatric microRNAs were found to regulate several genes, such as FTO, IGF1R, and INSR, previously associated with processes such as obesity, glucose homeostasis, adipogenesis, pancreatic islet mass regulation and food intake. These appear to be novel potential associations with the bariatric surgical response.

Conclusions
This study identified a set of microRNAs that appeared to be specifically altered following gastric bypass surgery. The target genes of the microRNAs appear to be biologically-plausible mechanistic candidates and may contribute to our understanding of the beneficial effects of bariatric surgery. This may lead to the development of an intervention that mimics these effects, enabling alternative treatments for obesity.
Supervised exercise training for intermittent claudication: The clinical, systemic and local biological effect

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Background and Objectives
Supervised exercise training (SET) is regarded as the gold-standard treatment for intermittent claudication (IC), however, the mechanism by which SET exerts beneficial effects has not been elucidated and little consideration has been given to potential detrimental effects. The clinical, systemic and local biological responses to exercise in this patient cohort are assessed in this study.

Methods
Participants were randomised to 12 weeks of treadmill based SET (Group 1) or a combination of treadmill and lower limb resistance exercise (Group 2). Data were collected before and after intervention and included pain free walking distance (PFWD), endothelial function, body composition, systemic inflammatory burden and skeletal muscle protein expression.

Results
Thirty five patients (25M, 10F mean age 71 years) were recruited. PFWD improved significantly for group 1 but not group 2, nor was there a difference between groups. Homocysteine and nitric oxide levels were negatively impacted for group 1 compared with group 2. Other markers of endothelial function were unchanged. Skeletal muscle mass decreased in group 1 and increased in group 2 with a significant difference between groups. Similarly a trend towards increased catabolic protein calpain in group 1 and reduced levels in group 2 was observed.

Conclusions
SET, specifically programs consisting of treadmill alone, may provide symptomatic improvement but are likely associated with detrimental systemic effects which may worsen health outcomes in patients with IC compared to a SET program incorporating lower limb resistance exercise.
Table 1: Outcome variables at baseline and after a 12 week supervised exercise intervention. All values reported as mean (SD).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Treadmill training alone (Group 1)</th>
<th>Treadmill training combined with lower limb resistance training (Group 2)</th>
<th>Between groups P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-Exercise</td>
<td>Post-Exercise</td>
<td>Change</td>
</tr>
<tr>
<td>PFWD, m</td>
<td>164 (84)</td>
<td>211 (94)</td>
<td>47 (82)</td>
</tr>
<tr>
<td>Skeletal Muscle Mass, kg</td>
<td>24.8 (6.9)</td>
<td>24.6 (6.7)</td>
<td>0.20 (0.58)</td>
</tr>
<tr>
<td>Calpain activity, FU (x10^5)</td>
<td>1.35 (0.59)</td>
<td>2.11 (1.25)</td>
<td>0.76 (1.37)</td>
</tr>
<tr>
<td>Homocysteine, umol/L</td>
<td>12.0 (2.5)</td>
<td>15.5 (4.3)</td>
<td>3.5 (3.0)</td>
</tr>
<tr>
<td>Nitric Oxide, uM</td>
<td>15.4 (10.5)</td>
<td>8.2 (5.6)</td>
<td>7.2 (7.5)</td>
</tr>
<tr>
<td>FMD, %</td>
<td>2.4 (2.7)</td>
<td>2.9 (2.8)</td>
<td>0.5 (1.4)</td>
</tr>
<tr>
<td>RH-PAT</td>
<td>2.03 (0.98)</td>
<td>2.06 (0.57)</td>
<td>0.03 (0.56)</td>
</tr>
</tbody>
</table>

Abbreviations - PFWD: Pain free walking distance; FU: Fluorescent units; FMD: Flow Mediated Dilatation; RH-PAT: Reactive Hyperaemia Peripheral Arterial Tonometry
Intra-tumour genomic heterogeneity in oesophageal adenocarcinoma

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Introduction
Oesophageal adenocarcinoma (OAC) poses a significant challenge to Western health care systems. Survival rates are poor, with an estimated 16% of patients (all stages) surviving beyond five years [1]. Worryingly, it also has the fastest rising incidence of any malignancy in the Western world; in the United States, incidence increased six-fold in the period 1975 to 2001, while mortality increased seven-fold [2]. Similar trends have been found in other populations, including Australia [3].

While morphological heterogeneity is a fundamental finding in cancer (in terms of both individual cells and tissue architecture), heterogeneity also exists at the molecular level [4]. Intra-tumour genomic heterogeneity (ITGH) presents some difficulties, particularly in terms of translational research, because of the potential for sampling error. The degree and clinical implications of ITGH have not been well studied in OAC.

Methods
Using single nucleotide polymorphism arrays, we compared the genome-wide copy number profiles generated from multiple, spatially-separated endoscopic biopsies of 18 primary OACs.

Results
We identified major differences between biopsies from the same tumour, both on a global and sample-specific basis. Further, we demonstrated that ITGH could interfere with higher-level analyses, such as the identification of ‘driver’ changes (using the genomic identification of significant targets in cancer (GISTIC) algorithm [5]). Of clinical relevance, one third of samples exhibited ITGH in genes currently targetable with chemotherapy (e.g. HER-2). Finally, we identified that a key contributor to apparent ITGH is contamination with normal stroma, and that the centre of the visible surface of a tumour generally yields a biopsy with the highest tumour percentage.

References
Intra-operative landmarks for the identification of the facial nerve in anterograde parotidectomy

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Introduction
Facial nerve trunk (FNT) identification during anterograde parotidectomy is paramount, because FNT injury causes substantial morbidity. Various landmarks are used intra-operatively. This study re-examines controversial landmarks and considers the importance of gender and dentition in landmark choice.

Methods
Distances from key landmarks to FNT were measured and compared by side, gender and dentition (92 specimens). Landmarks included posterior belly of digastric muscle (PBM), tragal pointer (TP), mastoid process (MP), external acoustic meatus (EAM) and transverse process of axis (TPA).

Results
2-sample T tests showing longer distances from: PBM to FNT in superficial compared to deep dissections (22.3±3.2mm vs. 9.6±3.4mm, P < 0.001); MP/TPA to FNT in men than in women (14.8±2.2mm vs. 13.5±1.6mm, P = 0.004; 37.6±4.4mm vs. 32.7±4.2mm, P = 0.001); EAM to FNT on occlusive sides than on the counterparts (14.2±1.8mm vs. 16.0±3.8mm, P = 0.020). Paired-T tests showing longer distances from: TP to FNT on right than on left side (21.4±2.7 vs. 19.9±2.9, P = 0.006); MP to FNT on the less dentulous maxillae than on the counterpart (14.4±2.1 vs. 13.0±1.6, P = 0.027); PBM/EAM to FNT on the less dentulous mandible than on the counterpart (9.8±1.6 vs. 7.8±2.5, P = 0.039; 16.4±3.0 vs. 14.1±1.5, P = 0.020).

Conclusions/Recommendations
Surgeons should be aware that distances of MP, PBM and EAM, to FNT, are lengthened in less dentulous patients, especially when maxilla and mandibles are non-occlusive. Overall, soft landmarks are less reliable than osseous landmarks, and TPA is the most reliable landmark for FNT identification.
Prevalence of KCNJ5 gene mutations is associated with an earlier presentation of Conn’s Syndrome and requires closer long-term follow-up

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Introduction
Patients with Conn’s Syndrome (CS) can present with severe hypertension and hypokalaemia. Surgery is curative in most cases. Two recurrent somatic mutations on exon 2 of the potassium channel (KCNJ5) gene have been identified in CS (G151R and L168R). We hypothesise that patients with KCNJ5 mutations have a more resistant variant of the disease.

Methods
Eighty patients with banked tumour samples that underwent surgery for CS were included in the study. Relevant clinical data for these patients were obtained and the DNA extracted. The KCNJ5 gene was sequenced using the Sanger technique and the mutation status of these patients was correlated with their respective clinical data.

Results
Thirty-four patients (43%) in the cohort demonstrated mutations in the KCNJ5 gene. Patients who were mutation positive were found to be significantly younger (p < 0.008) on presentation albeit with lower preoperative BP than mutation-free patients. Patients with the mutation were more easily ‘cured’ with surgery, with normalisation of BP and not requiring any medications postoperatively. Interestingly, postoperatively, the mutation-positive patients had higher aldosterone/renin ratios (p < 0.031) compared to their mutation-free counterparts.

Conclusion
We demonstrate that patients with somatic mutations in the KCNJ5 gene present with features of CS at a younger age than those without. They seem to have a better initial outcome with lower BP postoperatively and less requirements for medications but this may only be a temporary effect as they have persistently elevated aldosterone/renin levels postoperatively, the implications of which remain unknown and dictates closer follow-up long-term.
Mesenchymal Precursor Cell Mediated Disc Regeneration at the Time of Microdiscectomy

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Introduction
Lumbar microdiscectomy typically alleviates symptoms relating to neural compression, however it fails to address the underlying problem of disc degeneration. Following microdiscectomy discs fail to undergo spontaneous regeneration and patients may experience chronic lower back pain, persistent sciatica and radiculopathy, and recurrent disc prolapse[1-3]. We hypothesised that the transplantation of Mesenchymal Progenitor Cells (MPCs) formulated with Pentosan Polysulfate (PPS), embedded within a collagen scaffold, at the time of microdiscectomy, would induce disc regeneration in an ovine model.

Methods
Six sheep underwent a standardised lumbar microdiscectomy procedure at three levels (L2/L3, L3/L4, L4/L5) via a lateral retroperitoneal approach. Disc defects caused by microdiscectomy received either no treatment (NIL), a gelatin/fibrin glue scaffold (SCAF) only, or Mesenchymal Progenitor Cells (MPCs) and Pentosan Polysulfate (PPS) in SCAF (MPC+PPS+SCAF). Necropsies were undertaken six months post-operatively and the spines analysed radiologically, biochemically and histologically.

Results
Reduction in disc heights for levels undergoing microdiscectomy and receiving NIL, SCAF only or MPC+PPS+SCAF were 17.68%, 21.39% and 9.60% respectively. The reduction in disc height of the NIL and SCAF groups was significantly greater than the MPCs+PPS+SCAF group (P<0.05). Median Pfirrmann degeneration scores for the discs undergoing microdiscectomy and receiving NIL, SCAF or MPC+PPS+SCAF were 3.0, 3.0 and 2.0 respectively. The difference observed between SCAF and MPC+PPS+SCAF groups was significant (P=0.0213). Biochemical analysis demonstrated a significant increase in the content and, extractability of PGs from the NP of discs treated with MPC+PPS+SCAF versus discs receiving SCAF alone (p < 0.03).

Conclusion
These preliminary results demonstrate the potential capacity of MPCs and PPS to restore nucleus pulposus proteoglycan content, and preserve disc height and morphology following microdiscectomy.
Acknowledgements
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References
Surgical anatomy of the parapharyngeal compartment

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Introduction
Surgical access to the parapharyngeal compartment (PPC) is technically challenging and traditional approaches are associated with significant morbidity.¹ As surgical technology advances to allow more precise access to the PPC² it becomes imperative to have a more thorough understanding of the anatomical relationships of the compartment to surrounding structures.

Methods
Cadaver dissection of 10 half heads was performed employing different approaches: lateral to medial; medial to lateral (transoral); and posterior to anterior, supplemented by histology. Magnetic resonance images (MRI) of all specimens were analysed blindly by a consultant head and neck radiologist before comparing fascial arrangements seen on MRI with dissection findings.

Results
The PPC is a well-defined fat filled area identifiable on MRI. The styloid muscles and their fascia form the posterolateral border superiorly and, as they course inferiorly and medially, delimit the inferior border giving its classic “inverted pyramid” shape. Inferiorly, the fascia is continuous over the styloglossus with that of the submandibular region in most cases. The parapharyngeal fat is well circumscribed and separated from the masticator compartment anterolaterally by the medial pterygoid and tensor veli palatini muscles and fascia. The deep lobe of the parotid gland passes superior to the posterior belly of digastric to lie medial to the styloglossus muscle forming the posterolateral border of the PPC. Medially, the compartment is separated from the retropharyngeal compartment by a robust layer of fascia. Medial and posterior to the styloid muscles is a well-defined layer of fascia, reliably visualised on MRI: it effectively separates the anteromedial fat filled PPC from the posterolateral carotid compartment.

Conclusions
The PPC has a complex fascial arrangement. There is a distinct, robust fascia separating the parapharyngeal and carotid compartments that can be visualised on MRI and may be a useful surgical landmark. A three-dimensional understanding of the medial pterygoid muscle, styloid muscles, and posterior belly of digastric is essential when considering parapharyngeal compartment surgery.
References
An examination of the epidemiology, methodologic quality, and outcome
effect exaggeration in published randomised trials of surgical
interventions

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Introduction
Randomized controlled trials (RCTs) provide clinicians with the best evidence for the effects
of interventions, but little is known about their nature and characteristics. Specific scientific
methods are used to reduce the risk of bias, but the effects of these on outcome estimates
have not been explored empirically in surgery.

Aims
To explore the general characteristics and epidemiology of RCTs of surgical interventions,
and to assess the extent of outcome exaggeration in trials where adequate methods were
not reported.

Methods
In May 2009, three databases (MEDLINE, EMBASE and CENTRAL) were systematically
searched for RCTs that assessed a surgical intervention. General author and study
characteristics were extracted, as well as the reporting of methods to reduce the risk of bias:
sequence generation, allocation concealment, blinding, attrition, and funding. Primary
outcomes were extracted from each trial and standardised. Meta-regression was modeled to
explore the effects of risk of bias domains on outcome estimation.

Results
400 recently published RCTs were included. The most commonly represented surgical
subspecialties were general, orthopaedic and cardiothoracic. Reporting quality was low with
less than half of trials reporting adequate methods of sequence generation (42%), allocation
concealment (43%), blinding (35%), and source of funding (42%). Meta-regression showed
an exaggeration of outcomes by 37% with inadequate reporting of sequence generation,
33% with inadequate concealment, 43% with inadequate reporting of attrition, and 25% with
industry funding.

Conclusions
Empirical evidence exists for the distortion of outcomes when quality domains are not
reported. Authors, journals and the users of research must insist on clarifying these methods
so that results of trials are interpreted correctly.
General Surgical Interns Contributing to the Clerkship Learning Environment of Medical Students

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Introduction
Residents and interns are increasingly promoted as clinical teachers but limited details are available describing their exact contributions to student clerkship learning. Hence a study was conducted to explore the teaching contributions of interns in general surgery given that surgical disciplines place added emphasis on ‘apprenticeship-style’ teaching and supervision of students and residents.

Methods
This mixed-methods study involved two focus groups, attended separately by general surgical interns and Year 4 medical students, and the distribution of a questionnaire to Year 4 medical students. Incorporating a qualitative analysis system, coded responses from the focus groups were categorised into themes and used to construct the questionnaire.

Results
Focus groups were attended by six interns and five medical students and qualitative analysis revealed that contributions made by surgical interns fall into four distinct roles: physician, supervisor, teacher, and person. Data from 85 completed questionnaires (response rate 57%) showed that intern-student encounters occurred 5-6 times per week, lasting 1-2 hours per day, and took place largely in surgical wards. Interns typically demonstrated bedside procedures, interpretation of investigations (laboratory/radiological) and clerical administrative tasks. Students appreciated interns mostly for approachability, friendliness, and ability to relate to students. Interns had a crucial role in integrating students into surgical teams and relieving their anxieties. This significantly correlated to student clerkship enjoyment.

Conclusions
Surgical interns can significantly improve student clerkship learning environments by demonstrating ‘personal’ skills such as friendliness, approachability, relatedness, and creation of belongingness. This has important implications for the preparation of surgical interns as student preceptors.
An in vitro human model for analysis of small bowel and colonic motor activity

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Introduction
Very few studies measure motor activity of whole segments of human small or large bowel in vitro. The aim of this study was to establish a technique of characterising contractions in isolated human colon using high-resolution fibre-optic manometry.

Methods
Segments of human colon collected from laparotomies for non-obstructing colonic cancers are placed in organ baths. Alligator clips were attached to full thickness colon in 10mm intervals and connected to fibre-optic gratings on a high-resolution fibre optic catheter. Motor behaviour was recorded for an hour. Colectomies are divided into left and right anatomical groups. Propagating sequences are determined as contiguous contractions detected across 3 or more sensors, and divided into antegrade (oral-anal) and retrograde (anal-oral) events for analysis.

Results
21 specimens (14 left hemicolons, 7 right hemicolons) were studied. 10/14 (of left and 6/7 right hemicolons showed propagating sequences. Single, complex and repetitive contractions were seen. Frequency of propagating events remained constant over time. There were 24.3 +/-4 antegrade and 14.3 +/-6 retrograde events per hour in left colons, and 19.5+/-2.7 antegrade and 18.5+/-9.2retrograde events per hour in right colons. There were 3.5 +/-1.1 antegrade events to every retrograde event in left colons, and 2.2+/-1 in the right colons (p:0.68).

Discussion
In this study contractile behaviour was recorded from resected colon specimens in vitro. The isolated colon records differently from in vivo experiments, possibly reflecting the state of extrinsic denervation. The trend towards more retrograde contractions in the right hemicolon compared to left hemicolon, may relate to mixing function in the right hemicolon. This enables future interventions to study contractile behaviour in human colon.
Towards understanding the pathology of Dupuytren’s Disease; 
Identification of candidate genes using a whole exome sequencing approach

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Introduction and Methods
The aetiology of Dupuytren’s Disease is unknown, but there is strong evidence for a genetic cause in many familial cases, with the majority showing autosomal dominant inheritance with incomplete penetrance. The aim of this study was to identify mutations that may underlie the development of Dupuytren’s disease.

Results
Whole exome sequencing identified thirty four (34) non-synonymous mutations common to all 3 family members. Functional annotation and mutation prediction tools identified ADAM15, SERPIN1A, CDCC80, VPS41 and KLF11 as the mutated genes most likely to underlie the disease. Screening of other affected family members suggests only two of these mutations are present in the affected family members.

Conclusions
The work to date has identified two mutations that may underlie Dupuytren’s disease in this family. We are currently using cells from these patients to better understand how these mutations change fibroblast phenotype and can lead to the development of Dupuytren’s disease. It is hoped that a better understanding of the molecular pathology in this family will provide a foundation of knowledge to facilitate improved treatments for Dupuytren’s disease into the future.
Changes in lymph node number and morphology with senescence: A systematic review

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Introduction
Ageing is associated with an increase in the incidence of infectious diseases and certain cancers. Immunosenescence may be a critical factor. A systematic review was undertaken to investigate the effects of senescence on lymph node number and morphology.

Methods
Electronic databases MEDLINE, Embase and Google Scholar were searched for articles examining normal lymph node number and/or morphology with senescence. Data on lymph node number, gross anatomy and histoarchitecture were collected and analysed.

Results
A total of 20 articles (15 human and 5 animal studies) were eligible for inclusion; some were limited by poorly standardised methods and relatively small sample sizes. However, evidence exists to suggest both a decrease in lymph node number and histologic degeneration of lymph nodes with senescence, at least in some lymph node basins. Degenerative changes include loss of lymphoid tissue from both the cortex and medulla, reduced number and size of germinal centres, and changes such as fatty change, hyalinization, fibrosis, a decrease in high endothelial venules, and 'transparency'.

Conclusions
This is the first systematic review to address changes in lymph nodes with senescence. There is evidence to suggest both a decline in lymph node number and morphologic degeneration with senescence. These changes, which may adversely affect immune function and therefore the prognosis of infections and selected cancers in the elderly, deserve further investigation.
Enhancing recovery after laparoscopic sleeve gastrectomy: A Randomised Controlled Trial


Introduction
The aim of this randomised controlled trial was to evaluate whether optimised perioperative care within an Enhanced Recovery After Surgery (ERAS) protocol, improves surgical recovery after laparoscopic sleeve gastrectomy (LSG).

Methods
Patients were allocated to either the exposure group (EG), which received perioperative care according to a bariatric ERAS protocol, or the control group (CG), which received standard care. The EG and CG were also compared to an historic control group (HCG) formed from patients having LSG at our institution between 2006 and 2010 using matched propensity scores. The primary outcome was median length of hospital stay (LOS). Secondary outcomes included readmission rates, postoperative morbidity, postoperative fatigue, and mean cost per patient.

Results
There were 116 patients included in the analysis. Of these, 78 were allocated to either the EG (n=40) or the CG (n=38). There were 38 in the HCG. There were no differences in baseline characteristics. The LOS was significantly reduced in the EG when compared to the CG (EG: 1 day; CG: 2 days; p < 0.001) and the HCG (EG: 1 day; HCG: 3 days; p<0.001). The LOS was also reduced in the CG when compared to the HCG (p=0.010). There was no difference in readmission rates, postoperative complications or postoperative fatigue. The mean cost per patient in the HCG was significantly higher than in the EG (p=0.010) and CG (p=0.018).

Conclusion
The use of ERAS in the setting of bariatric surgery reduces LOS and is cost effective. There is no increase in perioperative morbidity.
Laparoscopic anterior 180° versus Nissen fundoplication for gastroesophageal reflux disease: Systematic review and meta-analysis of randomized clinical trials

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Introduction
LNF is currently the most frequently performed surgical therapy for GORD. Alternatively, 180° LAF has been alleged to reduce troublesome dysphagia and gas-related symptoms, with similar reflux control.

Methods
MEDLINE, EMBASE, Cochrane Library and ISI web of Knowledge CPCI-S were searched for randomized clinical trials (RCTs) comparing primary 180° LAF versus LNF. The methodological quality was evaluated to assess bias risk. Primary outcomes were esophageal acid exposure, esophagitis, heartburn score, dilatation for dysphagia, modified Dakkak dysphagia score [0-45] and reoperation rate. Meta-analysis was conducted at one and five years.

Results
Five distinct RCTs comparing 180° LAF (n=227) versus LNF (n=231) were identified. At one year, the Dakkak dysphagia score (2.8 vs 4.8; weighted mean difference (WMD) -2.25; 95% CI [-2.66, -1.83]; P<0.001), gas bloating (11% vs 18%; relative risk (RR) 0.59; 95% CI [0.36,0.97]; P=0.04), flatulence (14% vs 25%; RR 0.57; 95% CI [0.35,0.91]; P=0.02), inability to belch (19% vs 31%; RR0.63 ;95% CI [0.40,0.99]; P=0.05) and inability to relieve bloating (34% vs 44%; RR 0.74; 95% CI [0.55,0.99]; P=0.04) were lower after 180° LAF. Esophageal acid exposure (standardized mean difference (SMD) 0.19; 95% CI [-0.07,0.46]; P=0.15), esophagitis (19% vs 13%; RR 1.42; 95% CI [0.69, 2.91]; P=0.34), heartburn score (SMD 1.27; 95% CI [-0.36,2.90]; P=0.13), dilatation rate (1.4% vs 2.8%; RR 0.60; 95% CI [0.19,1.91]; P=0.39), reoperation rate (5.7% vs 2.8%; RR 2.08; 95% CI [0.80,5.41]; P=0.13), perioperative outcome, regurgitation, PPI use, LES pressure and patient satisfaction were similar after 180° LAF and LNF. At 5 years, the Dakkak dysphagia score, flatulence, inability to belch and inability to relieve bloating remained lower after 180° LAF. The five-year heartburn score, dilatation rate, reoperation rate, PPI use and patient satisfaction were similar.
Conclusions
At one and five years, dysphagia and gas-related symptoms are lower after 180° LAF compared with LNF, and esophageal acid exposure and esophagitis are similar, with no differences in heartburn scores, patient satisfaction, dilatations and reoperation rate. These results lend level 1a support for the use of 180° LAF for the surgical treatment of GERD.
Short Oral Presentations
Systematic Review of Robotic Liver Resection

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Introduction
In the past decade, robotic surgery system has been used increasingly in abdominal surgery. Scarce data is however available for its utilization in liver surgery. This systematic review was undertaken to collate and evaluate the published evidence for robotic liver resection.

Methods
Searches of the Medline and Embase databases were undertaken to identify studies of robotic liver resection focusing on the patient selection, operative strategy, morbidity, technical success and survival outcomes.

Results
Six observational studies and two cohort studies were reviewed. A total of 188 patients underwent robotic liver resection. Mean age of patients was 58.8 (range, 21-85). The most common indications for liver resection were colorectal liver metastases (31.9%), hepatocellular carcinoma (28.3%) and cholangiocarcinoma (5.35%). The most common procedures were segmentectomies (24.2%), left lateral sectionectomies (19.1%), and right hepatectomies (18%). The major liver resection rate was 34%. The mean operative time was 373.0 minutes and mean estimated blood loss 305.5mL. 5.9% of the operations were converted to either laparoscopic or open operations. There was no postoperative mortality and the perioperative morbidity rate was 23.4%. The mean hospital stay was 9.0 days (range, 4-46).

Conclusions
Robotic liver resection is feasible and safe in selected patients when carried out by trained surgeons. Future studies are required to further define the role and added advantages of robotic liver resection in the laparoscopic era.
Lymph node response is a powerful prognostic indicator in irradiated rectal cancer

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Introduction
Pre-treatment lymph node status is the achilles heel of rectal cancer staging. Thus accurate assessment of lymph node response post chemo-radiotherapy (CRx) and its subsequent oncological significance has only been studied in the form of tumour downstaging. Applying a novel system of lymph node regression grade (LRG), based on percentage of fibrosis and residual tumour cells, we aim to examine lymph nodes response after CRx.

Methods
Over a period of 10 years (2002-2012), 214 patients with locally advanced, non-metastatic rectal cancer received preoperative long-course CRx and underwent curative surgery. LRG scores were assigned prospectively by a senior pathologist. All other clinico-pathological data were collected retrospectively. Disease free (DFS) and overall survival (OS) curves were analysed using Kaplan-Meier method.

Results
The study revealed an overall recurrence rate of 18.9% (8% local) and overall mortality of 21.2%, with a median followup of 36 months. The average overall and disease free survival was 41 and 38 months respectively. On multivariate analysis, LRG score was a significant predictor of tumour recurrence but not mortality (p < 0.05). Predictors of lymph node response included time interval, site of rectal tumour and absence of other adverse pathological features. Kaplan-Meier analysis showed DFS and OS curves are worse in patients with a less regressive tumour in the lymph nodes (p < 0.05).

Conclusion
This study provides conclusive evidence that lymph node regression grade is an important prognostic indicator for DFS and OS. It also underpins the importance of comprehensive assessment of lymph nodes in irradiated rectal cancer.
Screening for colorectal premalignant and malignant pathologies following an episode of acute diverticulitis – Would a flexible sigmoidoscopy do the job?

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Introduction
Diverticulosis and colorectal cancer are common conditions encountered in the Western countries. It is common practice to perform a colonoscopy in patients following an episode of acute diverticulitis to exclude colorectal cancer, although the evidence in the literature for such a practice is not robust. The aim of this research is to retrospectively determine the yield of colorectal neoplastic lesions during colonoscopy performed following acute diverticulitis in a consecutive cohort of patients.

Methods
A prospectively maintained electronic database of a public teaching hospital was searched for International Classification of Diseases codes for acute diverticulitis from July 2007 to June 2011, and the medical records of each patient were reviewed.

Results
219 patients were diagnosed with acute diverticulitis with a median age of 60 years (range 24-93). 139 patients (63.5%) had follow-up screening colonoscopy which revealed polyps in 21 patients (15%) and no cases of colorectal cancer. Of the 21 patients with polyps, there were 14 patients (10%) with tubular/villous adenomas (13 in rectosigmoid region and 1 in descending colon).

Conclusion
The detection of colorectal cancer in patients undergoing routine colonoscopy following an acute episode of diverticulitis is rare. However, colonic polyps in the left colon are noted. A flexible sigmoidoscopy may be an adequate screening tool in such patients. A complete colonoscopy may be performed in patients with a family history of colorectal cancer or with polyps detected on the flexible sigmoidoscopy so as to evaluate the rest of the colon.
Table 1: Colorectal polyps and cancer detection in 139 patients who had screening colonoscopy

<table>
<thead>
<tr>
<th>Polyps</th>
<th></th>
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<tbody>
<tr>
<td>Yes</td>
<td>21 (15%)</td>
</tr>
<tr>
<td>No</td>
<td>116 (84%)</td>
</tr>
<tr>
<td>Not available</td>
<td>2 (1%)</td>
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</table>

<table>
<thead>
<tr>
<th>Histology</th>
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</thead>
<tbody>
<tr>
<td>Tubular adenoma</td>
<td>4 (2.9%)</td>
</tr>
<tr>
<td>Tubular adenoma with low grade dysplasia</td>
<td>7 (5%)</td>
</tr>
<tr>
<td>Tubulovillous adenoma</td>
<td>2 (1.4%)</td>
</tr>
<tr>
<td>Sessile serrated adenoma</td>
<td>1 (0.7%)</td>
</tr>
<tr>
<td>Others including benign polyps</td>
<td>3 (2.2%)</td>
</tr>
<tr>
<td>Not available</td>
<td>4 (2.9%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cancer, n (%)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>No</td>
<td>139 (100%)</td>
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</tbody>
</table>
A novel therapy targeting Flightless protein (Flii) reduces hypertrophic scarring

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Introduction
Hypertrophic scarring remains a major surgical challenge which carries a considerable burden of disease. Flightless (Flii) is a gelsolin like protein that has been shown to be a negative regulator of normal wound healing. We aimed to investigate the role of Flii in scar formation and its potential as a target for a novel therapy to prevent or reduce scarring.

Methods
A validated model of bleomycin induced scarring was applied to wildtype, Flii heterozygous and Flii overexpressing mice over 28 days and 56 days. Resulting scars were assessed and compared using immunohistochemical and biochemical techniques.

A monoclonal antibody targeting Flii was developed and used to treat scarring in the bleomycin model. Treated scars were compared IgG treated controls using immunohistochemical and biochemical techniques.

A series of human burn wounds and scars were collected and analysed for Flii levels.

In vitro studies were carried out using primary fibroblast cultures from human and murine skin.

Results
Flii is increased after wounding and remains elevated in human and murine scars. In the mouse model, scarring was significantly reduced in Flii heterozygous mice and increased in Flii overexpressing mice at both 28 days and 56 days. Scarring was significantly reduced in wild type mice treated with monoclonal antibody targeting Flii.

Conclusion
Flii appears to be a key regulator of hypertrophic scarring. Reducing Flii by using a monoclonal antibody therapy led to a significant improvement in scarring. This may represent a novel therapy to prevent or reduce hypertrophic scarring in the clinical setting.
A positive distal resection margin following rectal cancer surgery does not predict local relapse or overall survival

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² Clinical and Population Perinatal Health Research, Kolling Institute of Medical Research, University of Sydney, NSW, Australia

Introduction
Management of rectal cancer has improved dramatically over the past 30 years. From a surgical perspective, the extent of distal clearance is important when deciding whether reconstruction is possible. However, its relevance on oncological outcome remains debated. This study aimed to assess risk factors for local and distant relapse following rectal cancer surgery, and to explore the oncological implications of the distal resection margin (DRM).

Method
Patients undergoing rectal cancer surgery between 1995 and 2011 at Concord Hospital, Sydney, were prospectively studied. Outcome measures included local and distant relapse and survival. These outcome measures were modelled against patient and surgical factors, including age, tumour stage, tumour height, DRM, and circumferential resection margin (CRM). The DRM and CRM were judged to be positive when clearance was <10mm and <1mm, respectively.

Results
Of 935 patients undergoing surgery, 32% and 16% were staged as N-positive and M-positive, respectively. Local and distant relapse occurred in 12% and 16% of patients, respectively. A positive DRM was identified in 3% of patients, whilst 13% of patients had a positive CRM. Whilst patients with positive CRM demonstrated increased rates of local and distant relapse and higher mortality, a positive DRM did not increase local relapse or worsen survival. Increased tumour stage and lower tumour height were associated with disease relapse.

Conclusion
Positive DRM following rectal cancer surgery is not associated with increased local relapse or worsened overall survival. However, positive CRM and increased tumour stage remain strongly predictive of disease relapse as well as increased mortality.
Defining postoperative ileus: Results of a systematic review and global survey

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Introduction
There is a lack of an internationally accepted standardised clinical definition for postoperative ileus (POI). This has made it difficult to estimate incidence, identify risk factors and has compromised the external validity of clinical trials by impairing ability to compare the relative efficacy of competing therapies.

Aim
To clarify the terminology of POI and provide concise, clinically quantifiable definitions which may be used for future studies.

Methods
A systematic review was conducted according to PRISMA guidelines to extract definitions from randomised controlled trials (RCTs) published between 1996-2011 investigating POI after abdominal surgery. This was followed by an online global survey seeking opinions of experts in the field.

Results
Definitions were extracted from 52 identified RCTs. Responses were received in the online survey from 45 of 118 experts. Data were amalgamated to synthesise the following definitions: “postoperative ileus (POI)” – interval from surgery until passage of flatus/stool AND tolerance of an oral diet; “prolonged POI” – two or more of nausea/vomiting, inability to tolerate oral diet over 24hrs, absence of flatus over 24hrs, distension, radiologic confirmation – occurring on or after Day 4 postoperatively without prior resolution of POI; “recurrent postoperative ileus” – two or more of nausea/vomiting, inability to tolerate oral diet over 24hrs, absence of flatus over 24hrs, distension, radiologic confirmation – occurring after apparent resolution of POI. Concordance of the latter two definitions with survey responses were ≥75%.

Conclusions
There is considerable heterogeneity with which terminology and definitions of POI are used. We have proposed standardised endpoints for use in future studies in order to allow objective comparisons between competing interventions.
Effects of post transplant weight changes on renal transplant outcomes

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Aim
The effect of obesity on renal transplant patients is a phenomenon that has been previously explored with conflicting results. Post transplantation weight gain has been reported to increase rates of graft loss in patients independent of its association with metabolic syndrome. The relationship between weight changes post transplantation and patient survival is yet to be investigated. This study aims to evaluate the impact of post transplant weight changes on renal transplant outcomes and patient survival in a single institution.

Method
A retrospective analysis was performed on 454 consecutive patients who received a renal transplant at Westmead Hospital from January 2001 to December 2010. The prevalence of weight changes at 1-year post transplantation and its effects on graft and patient survival was investigated.

Results
Patient survival to 1 year was 94.5% (429 patients). Weight changes were categorised into 3 groups, weight loss >10%, stable weight (gain or loss within 10%), and weight gain >10%. At 1-year post transplantation, 5.2% of patients lost weight, 59.3% remained stable and 35.5% gained weight. Weight change post transplantation did not have a statistically significant effect on graft failure, death censored graft failure or patient survival. One-year post transplant BMI also did not have a statistically significant effect on patients’ outcomes.

Conclusion
The majority of transplant patients do not experience major changes in weight post transplantation. Clinically significant weight gain or loss at 1-year post transplantation does not seem to affect graft or patient survival.
Transcutaneous electrical stimulation (TES) and intractable chronic constipation

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Background/Aims
Intractable chronic constipation in the form of slow-transit constipation (STC) is often resistant to medical treatment. Some children required appendicostomy for antegrade enemas to improve symptoms. Transcutaneous electrical stimulation (TES) was used by physiotherapists to overcome STC in children successfully. This study aimed to examine the effectiveness of home-based TES when STC children were trained by a naïve clinician. We hypothesized TES would improve symptoms with reduced laxative use.

Methods
A prospective study (2009-2011) whereby a surgeon was trained to deliver TES method to STC children/parents, who then self-administered TES at home (1 hr/day x 6 months) using a battery-powered interferential stimulator. Daily continence diary (including laxative use) was recorded before and throughout TES; PedsQL4.0 questionnaires and gastrointestinal nuclear transit scintigraphy (NTS) were completed before and after TES. Appendicostomy for antegrade enemas was offered if TES failed to improve symptoms. Statistical analyses performed with paired t-test & chi-square test; p<0.05 considered significant.

Results
Sixty-two children (34 female, ages: 2-16yrs, mean: 7yrs) completed home-based TES successfully. Symptoms improved significantly in 56/62 (90%) STC children with gastrointestinal transit index improved after TES (Table 1). The 2 children who stopped laxative prior to TES had symptom improvement without further laxative use. Only 6 children (10%) required appendicostomy for antegrade enemas.

Conclusion
Home-based TES is non-invasive. It is a promising treatment for STC children with avoidance of surgery and reduced laxative use with improved symptoms in most children. Success required clinician training and close patient contact.
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Pre-TES</th>
<th>Post-TES</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soiling (days/wk)</td>
<td>4.6±2.4</td>
<td>0.7±1.1</td>
<td>&lt;0.0001 (paired t-test)</td>
</tr>
<tr>
<td>Defecation (bowel action/wk)</td>
<td>1.6±1.6</td>
<td>3.5±1.9</td>
<td>&lt;0.0001 (paired t-test)</td>
</tr>
<tr>
<td>Abdominal pain (days/wk)</td>
<td>1.7±1.9</td>
<td>0.2±0.5</td>
<td>&lt;0.0001 (paired t-test)</td>
</tr>
<tr>
<td>Laxative use</td>
<td>No laxative – 2</td>
<td>Stopped laxative – 15</td>
<td>&lt;0.01 (Pearson chi-square)</td>
</tr>
<tr>
<td></td>
<td>On laxative – 60</td>
<td>Reduced laxative – 30</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Same laxative – 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remained with no laxative - 2</td>
<td></td>
</tr>
<tr>
<td>Gastrointestinal transit index</td>
<td>10.8±1.6</td>
<td>11.6±1.6</td>
<td>&lt;0.002 (paired t-test)</td>
</tr>
</tbody>
</table>
Outcome measures of patients who have undergone surgery for oral cancer. A preliminary report.

Sun, KCV, Abood, A, Caplash Y

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Introduction
The outcome of management strategies for the treatment of oral cancer has always been in terms of disease-specific survival. Modern assessment of outcome now also includes assessment of quality of life (QoL). Little has been done previously in Australia to assess the QoL of patients treated primarily by surgery for oral cancer.

Methods
Cross-sectional study on patients who had undergone primary surgical management for oral cancer underwent assessment of QoL using the European Organisation for Research and Treatment of Cancer QoL questionnaire (EORTC QLQ-C30) and the University of Washington Head and Neck QoL questionnaire (UWQOL). Similar emotional domains were compared and factors affecting QoL were determined

Results
Good QoL scores were experienced by most patients. A new addition to the UWQOL was the mood and anxiety domains, and these correlated well with the emotional domains of the EORTC QLQ-C30 using Spearman rank correlations. Factors significantly affecting survival include age, overall stage, neck dissection, free flap, and postoperative radiotherapy using Mann-Whitney tests (p<0.05)

Conclusions
This study confirms previous reports in the literature. It has provided us with the foundation for further investigation of QoL in patients who have been and who will be treated for oral cancer. It also gives us a new measure of outcome to compare against survival rates
Surveillance of Small Rectal Carcinoid Tumors in the Absence of Metastatic Disease

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Background
The incidence of rectal carcinoids is rapidly increasing, typically presenting as small (<1.0 cm) localized tumors. While the evaluation of rectal carcinoids on presentation is well standardized, surveillance following resection has not been well established.

Methods
A prospective database documented patients with rectal carcinoids at our institution between January 1995 and September 2011. Information collected included patient and tumor characteristics, treatment method, surveillance schedule, recurrence, and survival.

Results
Twenty-eight patients with rectal carcinoid were identified. Ten patients were excluded for tumors >1 cm, known metastases, <6 months follow-up, or previous resection. The mean age of the remaining patients was 56±3 years and 61% were female. All patients were diagnosed on endoscopy, with 50% diagnosed incidentally on screening endoscopy. Treatment methods included endoscopic therapy (n=13, 72%), transanal excision (n=3, 17%), and transanal endoscopic microsurgery (n=1, 5.5%). One patient (5.5%) received no additional invasive therapy after diagnostic endoscopy. The mean tumor diameter was 4.6±0.5 mm. The average length of follow-up was 5.4±0.9 years, with a median number of 2 follow-up endoscopies (range 0–6). Two patients (11%) died within the follow-up period from non-carcinoid causes. Importantly, no surviving patients developed local or distant recurrence with up to 12.3 years of follow-up.

Conclusion
Based on this experience, patients presenting with small (≤1.0 cm), non-metastatic rectal carcinoids are unlikely to develop local or distant recurrence after resection. Aggressive surveillance with repeat endoscopies or other imaging studies after resection may be unnecessary in this patient population.
Outcomes and complications after laparoscopic colorectal surgery with mechanical bowel preparation

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Introduction
Recently, the use of routine mechanical bowel preparation (MBP) in colorectal surgery has come under scrutiny due to a possible increase in postoperative complications [1]. Currently, there is no international consensus on its use. Indeed, there are certain instances during planned laparoscopic resections where formal preparation of the colon is still desirable. Accordingly, surgical societies around the world have failed to recommend omission of MBP from perioperative protocols [2,3]. Therefore, appreciation of the impact of MBP on postoperative outcome is important. This study examined the perioperative outcomes of patients undergoing laparoscopic colorectal resections with routine MBP at a tertiary teaching hospital.

Methods
Relevant perioperative data in 527 consecutive patients who underwent laparoscopic colorectal procedures between 2006 and 2011 were recorded prospectively, to determine the nature and prevalence of postoperative complications.

Results
Overall, 162 patients (30.7%) suffered postoperative complications. There were 5 deaths (0.9%), 21 cases requiring reoperation (4.0%), 17 cases of intra-abdominal infection (3.2%) and 28 wound infections (5.3%). Of the 444 patients in whom intestinal continuity was restored, there were 4 cases of anastomotic leak (0.9%).

Conclusions
The major complication rates observed in this study are comparable with those in the published literature [2,4]. Laparoscopic colorectal surgery with routine MBP does not appear to compromise postoperative outcome. It can be safely used to facilitate on-table colonoscopy to locate diseased segments in inflammatory conditions or small neoplastic lesions that have not been marked pre-operatively. Further RCTs specific to laparoscopic procedures are desirable.

References
Warm Humidified Carbon Dioxide Gas Insufflation for Laparoscopic Appendicectomy in Children: A Double-blinded Randomised Controlled Trial

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2 Department of Paediatric Surgery and Urology, Starship Children’s Hospital, Auckland District Health Board, New Zealand
3 Department of Paediatric Anaesthesia, Starship Children’s Hospital, Auckland District Health Board, New Zealand

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Introduction
Pneumoperitoneum during laparoscopy is typically created with dry, room temperature carbon dioxide (CO₂) gas which leads to desiccation-related structural and inflammatory alterations to the peritoneal mesothelial lining. Clinically, this has been linked to additional postoperative pain and delayed recovery. Warm humidified insufflation gas prevents peritoneal desiccation and is hypothesised to improve patient outcomes in children after laparoscopic appendicectomy.

Methods
A double-blinded, randomised controlled trial was implemented. Participants in the intervention group received warmed (37°C) humidified (98% relative humidity) insufflation gas while control participants received standard room temperature (20°C) gas with 0% relative humidity. Perioperative analgesia and anaesthesia was standardised and intraoperative core body temperature was monitored at ten-minute intervals. At the conclusion of surgery, severity of laparoscopic camera lens fogging was rated by the primary surgeon. Postoperative opiate usage was expressed as Morphine Equivalent Daily Dosages (MEDD) and pain intensity at rest and on moving was rated using visual analogue scales. Postoperative recovery and return to normal activities on day 10 were assessed using a questionnaire.

Results
Between February 2010 and March 2011, 190 participants were randomised. Intervention (N = 95) and Control (N = 95) groups were matched at baseline and intraoperative core body temperature variation was statistically similar. There were no statistically significant differences in postoperative MEDD and pain intensity scores. Postoperative recovery parameters and the severity of camera lens fogging were also found to be statistically similar.

Conclusion
Warm humidified CO2 gas insufflation for laparoscopic appendicectomy has no short-term clinical benefits in paediatric patients.
Cervical fascia and its compartments: A terminological headache

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Introduction
Understanding the cervical fascia is necessary for accurate radiological differential diagnosis and safe head and neck surgery. There are disagreements in the naming of this fascia reflecting both international and interdisciplinary differences in terminology¹,². We reviewed the recommended textbooks for Australasian surgical and radiological trainees to identify areas of agreement and controversy.

Methods
Textbooks from the recommended reading lists of the Radiology, Otolaryngology, Head and Neck Surgery, Plastic and Reconstructive Surgery and General Surgery specialist training schemes in Australasia were compared with a landmark anatomical study³ and two contemporary anatomical reference texts.

Results
Twenty-six textbooks were reviewed; twenty-three described cervical fascia within thirty-five chapters. The description of the superficial cervical fascia varies greatly. Deep fascial layers are more consistently described but with a variable nomenclature. There is inconsistency in the naming and arrangement of the fascia related to the cervical viscera and the submandibular, parapharyngeal and retropharyngeal “spaces”. The descriptions of the associated potential spaces were variable and differed according to the understanding of the related fasciae.

Conclusions
Reference texts for anatomists and surgical and radiological trainees show major inconsistencies in the terminology and descriptions of cervical fascia. This is a barrier to education and interdisciplinary communication. An evidence-based classification acceptable to surgeons and radiologists is needed to provide a common language and understanding of fascial planes and compartments in the head and neck.

References
Achieving breast symmetry in patients with developmental breast asymmetry using a 3D laser scan

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Introduction
Most women have some degree of breast asymmetry. However, a small number of adolescent patients present with developmental breast asymmetry and they are often affected psychosocially. It is often challenging to attempt to achieve symmetry in these patients by correction of breast volume, shape, nipple areolar complex location and size. As such, a significant number of patients undergo primary and secondary reconstructive operations to achieve desired symmetry. At the Flinders Medical Centre, a method for breast volume assessment has been developed using a 3D laser scanner with pre-operative land marking.

Methods
This is a retrospective audit of developmental breast asymmetry cases between 2008 and 2012. Post operative clinical photographs, 3D scans and reports from patients were analysed.

Results
11 patients were audited, of which nine patients had completed surgery. One patient had significant complication which required surgical revision. One was complicated by haematoma requiring surgical evacuation. Post operative clinical photography, 3D scans with volume measurements and reports from patients indicate that 3D laser scanning has been helpful in achieving volume symmetry. However, breast shape symmetry remains more of a challenge and further experience with 3D laser scanning will allow us to develop a better picture of its role in these patients.

Conclusions
Early results of use of 3D laser scanning in developmental breast asymmetry suggests it may aid in achieving symmetry for these patients but further studies are needed to confirm this.

References
The use and utility of medical imaging in the diagnosis and management of acute appendicitis at Nambour General Hospital: A prospective audit

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Introduction
Acute appendicitis is one of the most common surgical conditions managed by the acute surgical team at Nambour General Hospital. The diagnosis was once made on clinical presentation alone however changing medical practices has seen the rise in the use of medical imaging in the diagnosis of acute appendicitis and the aim of this project was to investigate the current state of clinical practice at Nambour Hospital and whether medical imaging was being employed appropriately.

Methods
Prospective audit of all patients admitted to the Nambour General Hospital over a three month period with a potential diagnosis of acute appendicitis or undifferentiated right iliac fossa (RIF) pain. Data was recorded pertaining to the source of imaging requests, the type and frequency and patient demographics of those having medical imaging and how this correlated with their ultimate diagnosis including findings at surgery and histopathology if relevant.

Results
139 patients (males = 69, females = 70) were admitted to NGH over a three month period with a possible diagnosis of acute appendicitis with a mean age of 29.5. 84.9% (n=118) of patients had medical imaging, with DEM requesting 57.6% of all imaging. 88 patients had an abdominal ultrasound (USS) scan, with a mean age of 23.9 and a female preponderance (60%). 37.5% of these patients findings at USS suggestive of acute appendicitis of which all showed surgical and histological concordance. In 31.8% of USS the appendix was not seen and no other pathology was identified. 53.5% of the patient’s with USS where the appendix was not seen went on to have surgery and 66.6% of these did indeed have acute appendicitis.

16 patients had USS which demonstrated an alternative diagnosis such as mesenteric adenitis or ovarian cysts and none of these went on to be diagnosed with acute appendicitis. 42 patients with a mean age of 46 had a CT abdomen/pelvis with a sensitivity of 83% and a specificity of 100%. 21 patients did not receive any medical imaging with a mean age of 24.4 and a male to female ratio of 6:1. 95.2% of these patients went on to have a laparoscopic appendicectomy with a negative appendix rate of 15%.
For all patients who underwent a laparoscopic appendicectomy the negative appendix rate was 9.5%. 34 patients had an alternate diagnosis made and none of these patients represented within a one month period after data collection with acute appendicitis.

Conclusions
Most patients who are admitted to the Nambour general hospital with a possible diagnosis of acute appendicitis undergo some form of medical imaging, with abdominal ultrasound scanning being the most popular choice. This study has shown that the use of medical imaging appears to reflect age, sex and clinical presentation parameters. While abdominal USS is a useful test, this study has shown that the sensitivity is low and therefore highlights the need for careful consideration of the patient’s clinical presentation, particularly when the appendix has not been visualised. The use of CT at this centre appears to be appropriately reserved for older patients in which other, more sinister diagnoses must first be excluded. It would appear that Nambour hospital’s low negative appendicectomy rate is in part attributable to the extensive use of medical imaging, as when it is not employed, the rate reflects that of generally accepted historical rates. Medical imaging is therefore being appropriately and judiciously used in the diagnosis of acute appendicitis at Nambour General Hospital.
Hearts from Donations after Circulatory Death (DCD) donors – assessment on clinically approved ex-vivo Organ Care System


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Introduction
Utilising pharmacological ischaemic post-conditioning strategies, we have demonstrated excellent cardiac functional recovery in DCD hearts following 30 minutes warm ischaemia time (WIT)\(^1\). This has been validated on an ex-vivo construct in the laboratory. The aim of this study was to assess recovery of DCD hearts in a clinically approved Organ Care System – Transmedics OCS. This ex-vivo perfusion device allows assessment of marginal organs from brain dead donors prior to transplantation (Tx). We hypothesized that the Transmedics OCS would provide a suitable platform to gauge the viability of DCD hearts.

Methods
Hearts were exposed to 30 mins WIT in a DCD asphyxia porcine model, before being flushed with Celsior supplemented with glyceryl trinitrate (GTN), Erythropoietin (EPO) and Zoniporide as part of the post-conditioning strategy. Hearts were explanted/cannulated for perfusion on the Transmedics OCS (t= 3.5 hours). Hearts were assessed by evaluating recovered cardiac rhythm, hourly arterial/venous lactate measurements and overall lactate trends - clinical studies have shown lactate levels of < 5 to correlate with good cardiac function post-transplant and successful wean from cardiopulmonary bypass (CPB)\(^2\).

Results
5 DCD hearts have been assessed to-date, all recovered to a sinus rhythm. 4/5 hearts had lactate extraction (coronary sinus lactate lower than coronary artery inflow lactate) and steadily decreasing lactate levels over the course of ex-vivo perfusion. 4/5 hearts had lactate levels <5, compatible with heart viability for transplantation.

Conclusion
DCD hearts with WIT ≤ 30mins display metabolic performances in keeping with successful outcomes post-Tx, and thus appear to be viable for cardiac transplantation. Further assessment of cardiac functional recovery in a porcine Tx model is underway.

References
Renal cell carcinoma presents with more advanced stage disease in patients from regional areas compared to their metropolitan counterparts


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Introduction
Our aim was to determine whether patients from regional Victoria present with more advanced stage kidney cancer than their metropolitan counterparts.

Methods
Using the Australian Standard Geographical Classification - Remoteness Area (ASGC-RA) developed by the Australian Bureau of Statistics to allow comparison between metropolitan and rural Australia. Based on their location of residence at the time of surgery, a cohort of 204 patients who underwent partial or total nephrectomy were identified retrospectively and assigned an ASGC-RA (metropolitan RA1, inner regional RA2, outer regional RA3). Additional data collected: age, gender, ASA score, presentation, stage and histopathology.

Results
There were 84 patients from RA1, 51 from RA2 and 11 from RA3. Mean age of patients from each area: 59.2, 62.9 and 57.9 years respectively. No significant difference between the groups with regard to age, sex or ASA. Presentation of RCC was symptomatic in 64% of cases from RA3, compared with only 43% of RA1 and 41% of RA2. There was a significant association between increasing ASGC-RA and clinical T-stage, with the proportion of T1 tumours falling from 63% of RA1 to 27% of RA3 patients, and conversely T4 tumours rising from 4% of RA1 to 27% of RA3 patients. Overall, the proportion of patients with T3+ disease rose from 30% of RA1 to 73% of RA3 patients. Similarly, the proportion of patients presenting with M1 disease rose from 11% of RA1 to 27% of RA3 patients.

Conclusion
Renal cell carcinoma presents with more advanced stage disease in patients from regional areas. Whilst determining the exact cause for this variation is beyond the scope of the present study, our findings nevertheless reinforce the inequality of access, and thus poorer health outcomes, experienced by regional Australians.
Early Cholecystectomy in Grade II and III acute calculous cholecystitis is feasible and safe

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Introduction
Despite the inception of Tokyo guidelines for the management of acute cholecystitis, the management of patients with moderate and severe acute cholecystitis still remains controversial. The aim of this study is to determine the safety, efficacy and outcome of cholecystectomy in moderate and severe acute calculous cholecystitis.

Methods
A retrospective study of 229 consecutive patients with diagnosis of acute calculous cholecystitis between June 2011 and August 2012 was performed. The severity of acute cholecystitis was classified based on the Tokyo guidelines. Their management and outcomes were evaluated.

Results
There were 60 patients with grade II and 24 patients with grade III cholecystitis. Fifty-three (88%) grade II patients underwent surgical interventions with 52/53 (98%) being laparoscopic cholecystectomy. Twenty-one (88%) of grade III patients underwent surgical interventions, with 16/21 (76%) being laparoscopic cholecystectomy. The open conversion rate was significantly higher in patients with grade III cholecystitis when compared to grade II (4/21 vs. 1/53; p<0.05). Three patients underwent percutaneous cholecystostomy. There was no perioperative mortality. One grade II patient and two grade III patient required ERCP for bile leak.

Conclusion
This study demonstrated that index laparoscopic cholecystectomy is safe and feasible in patients with grade II and III acute cholecystitis.
Prevalence of functional bowel disorders and faecal incontinence: A primary-care survey

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Introduction
Faecal incontinence (FI) and functional bowel disorders (FBDs), including constipation and irritable bowel syndrome (IBS), are chronic and debilitating and present a significant management problem for surgeons. However, epidemiological studies are lacking in Australian populations. The aim of this study was to measure the prevalence of FI and FBDs among primary health-care seekers using objective criteria.

Methods
A cross-sectional survey was conducted amongst primary health-care seekers in Sydney, Australia. A self-administered questionnaire was used to diagnose FI and FBDs using objective, symptom-based Rome-III criteria. Data was modelled to identify associations with medical and surgical histories and health-care utilisation.

Results
396 of 596 subjects (66.4%) approached agreed to participate. FI, constipation and IBS were diagnosed in 12.1%, 8.1 and 11.1%, of subjects, respectively. Subjects with FI were 4 times more likely to have had previous anal surgery (OR 3.80, 95%CI 1.55–9.33) and to have IBS (OR 3.80, 95%CI 1.82–7.93) and 3 times more likely to have urinary incontinence (OR 3.24, 95%CI 1.73–6.08). Subjects with IBS were 9 times more likely to have had a previous colonoscopy (OR 9.32, 95%CI 3.10–28.04) and 3 times more likely to report anxiety or depression (OR 3.42, 95%CI 1.78–6.58) and to have had a previous cholecystectomy (OR 3.11, 95%CI 1.16–8.37).

Conclusions
FI and FBDs appear to be prevalent conditions amongst primary health-care seekers. Furthermore, patients with these conditions suffer with co-existing symptoms and conditions, suggesting that detailed assessment is required to adequately address their needs. These findings have implications for health service planning/provision.
Serotonergic neurotransmission is not required for peristalsis

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2 Department of Surgery, Flinders Medical Centre, SA
3 SA Pathology, SA

Introduction
Considerable evidence points to a role for serotonin release in governing intestinal motility. Recent evidence shows no role of mucosally derived serotonin (the bulk of serotonin in the gut wall is in enterochromaffin cells) in colonic motility. It has been postulated that minute amounts found within the myenteric plexus fulfills this role. We aim to investigate the effects acute serotonin depletion on peristalsis.

Methods
Guinea pig colon was harvested following acute depletion of myenteric serotonin with reserpine. The mucosa was removed and the preparation studied with video recordings with free and fixed pellets, and fluid propulsion to measure peristalsis. Serotonin receptors antagonists granisetron and ondansetron (5-HT3) and SDZ 205-557 (5-HT4) were used to study receptor effects. Mass spectrometry and immunohistochemistry were used to confirm serotonin depletion.

Results
Serotonin depletion in the colonic wall was confirmed by mass spectrometry and immunohistochemistry. Colon depleted of mucosal and myenteric serotonin exhibited peristaltic waves. Force and frequency of peristaltic waves as evoked by insertion of natural pellets and fluid propulsion were unchanged. Perfusion of antagonists resulted in transient retardation but eventual recovery of peristalsis, even in specimens depleted of serotonin.

Discussion
These results indicate that endogenous serotonin, mucosal or myenteric derived, is not required for the generation of peristalsis. The effects of antagonists are transient and are not mediated by blockade of the action of endogenous 5-HT.
Delays in the colorectal cancer referral pathway in a tertiary referral centre

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Introduction
Prompt access to diagnosis and treatment is important if survival from colorectal cancer (CRC) is to be improved, since 90% are potentially curable if detected at an early stage. However, the referral and diagnostic pathway is complex and potentially subject to delays. The aim of this study was to evaluate the pathway of patients with CRC in a tertiary unit by measuring time intervals from referral to treatment.

Methods
The case notes of patients with CRC were reviewed with stratification into (i) emergency presentations; (ii) elective presentations - subdivided into (a) direct referrals from GP to colorectal surgeons (b) indirect referrals via secondary care. The following were measured in each: overall time from referral to commencement of treatment, time from referral to colorectal appointment and then colorectal appointment to primary treatment.

Results
Of the 101 patients (53F, age 74 years), 25% presented as emergencies and 55 of 76 (72%) were indirect referrals. The median time from presentation to commencement of treatment was significantly shorter for emergency presentations (10 vs 71 days; p<0.0001). For elective presentations, the overall time from presentation to start of treatment was significantly longer in patients referred indirectly (91 vs 40 days; p=0.0005) due to increased time from initial presentation to colorectal surgeon appointment (63 vs 5 days; p<0.0001).

Conclusions
Emergency presentations of CRC are managed promptly and direct elective presentations in a timely manner. However, indirect referrals present a challenge due to the delay that occurs with the inclusion of an additional secondary care provider.

References

Acknowledgements
Jennifer White and Gael Sinclair for assistance in data collection
The incident involving Dr Jayant Patel at Bundaberg Base Hospital has been linked in the media and the specialist literature with the establishment of mandatory reporting laws for health professionals in Australia, as embodied in the *Health Practitioner Regulation National Law Act 2009*.

The High Court of Australia decision of *Patel v The Queen* [2012] HCA 29 (August 24 2012), quashed Patel’s conviction for killing and maiming patients and ordered a retrial. The original prosecution case had initially been that Patel was incompetent and grossly negligent in the conduct of his surgical procedures and post-operative treatment which he supervised. However, on day 43 of the trial, the prosecution case was revised to be that the surgical procedures should not have been undertaken in the first place. The High Court rejected the argument that Patel was prosecuted under a wrong provision of the Queensland *Criminal Code*, but held that a miscarriage of justice had still occurred.

This poster presentation will deal with the legal issues created by the High Court not overturning the expanded definition of medical treatment. There is now a clear precedent that the act of performing a medical treatment is more than just the surgical manipulation of instruments, but includes “all that is provided in the course of such treatment, from the giving of an opinion relating to surgery to the aftermath of surgery.”
Incidence and outcomes of patients presenting to the emergency department with acute lower gastrointestinal haemorrhage

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¹ Academic Colorectal Unit, Concord Hospital Campus, School of Medicine, University of Sydney, NSW, Australia. Email: m.a.gladman@sydney.edu.au
² Clinical and Population Perinatal Health Research, Kolling Institute of Medical Research, University of Sydney, NSW, Australia

Introduction
Anecdotally, acute lower gastrointestinal haemorrhage (LGIH) is a common reason for Emergency Department (ED) presentation and accounts for a significant proportion of general surgical admissions, although no previous studies have investigated this. Furthermore, increasing numbers of patients are taking anti-platelet/coagulant therapy. The aim of this study was to determine the incidence of patients with LGIH presenting to ED and identify factors associated with admission and outcome.

Methods
A retrospective analysis was performed of patients presenting to Concord Repatriation General Hospital ED in 2008-10 with bleeding per rectum. Patient characteristics and outcomes associated with admission were examined, including mortality, rates of hospital admission, radiological investigation, angiographic embolisation and surgical intervention.

Results
LGIH accounted for 482 (253M, median age 63 years) of 63,604 (0.76%) of ED presentations. No deaths were recorded. Admission was necessary in 54.3% and significantly associated with diverticular disease and post-operative bleeding (P<0.001). Of those admitted, half (49.6%) were managed supportively, 35% underwent endoscopy, 7.2% required CT angiography and 4.2% underwent formal angiography. Only 3.4% required surgical intervention. Patients requiring admission were more likely to be older, have lower diastolic BP and lower haemoglobin levels (P<0.001), and be on anti-platelet or anti-coagulant therapy. Most common definitive diagnoses were haemorrhoids (16.0%), diverticular disease (13.2%) and colitis (10.9%).

Conclusion
LGIH accounts for 1% of ED presentations, of which half required admission. Overall, mortality and surgical intervention rates were low. Whilst the aetiology is heterogeneous, most patients can be managed supportively, although access to interventional radiology and endoscopy is important.
Risk Factors for the Development of Prolonged Postoperative Ileus following Elective Colorectal Surgery.

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Introduction
Prolonged postoperative ileus (PPOI) increases postoperative morbidity and prolongs hospital stay. An improved understanding of the elements which contribute to the genesis of PPOI is needed in the first instance to facilitate accurate risk stratification and institute effective preventive measures. The aim of this study was to determine the peri-operative risk factors associated with development of PPOI.

Methods
All elective intra-abdominal operations undertaken by the Colorectal Unit at Auckland District Health Board between 1 January to 31 December 2011 were retrospectively accessed. Data were extracted for an assortment of patient characteristics and peri-operative variables. Cases were stratified by the occurrence of clinician diagnosed PPOI. Univariate and regression analyses were performed to identify correlates and independent risk factors, respectively.

Results
255 patients were identified of whom 50 (19.6%) developed PPOI. The median duration for PPOI was 4 days with 98% resolving spontaneously with conservative measures. Univariate analysis identified increasing age; procedure type; increasing opiate consumption; elevated pre-operative creatinine; postoperative haemoglobin drop, highest white cell count and lowest sodium; and increasing complication grade as significant correlates. Logistic regression found increasing age (OR1.032, 95% CI 1.004 – 1.061; p=0.026) and increasing drop in pre- to postoperative haemoglobin (OR 1.043, 95% CI 1.002 – 1.085; p=0.037) as the only independent predictors for developing PPOI.

Conclusions
Increasing age and increasing drop in haemoglobin are independent predictors for developing PPOI. Prospective assessment is required to facilitate more accurate risk factor analysis.
# 49th Surgical Research Society Meeting – Evaluation Form

Please fill out this form, tear it out of booklet and give to Registration Desk

*Please note that it is a requirement of CPD that we produce an evaluation form*

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What changes would you recommend for future SRS meetings?

Any other feedback?
# Membership Application Form

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