Surgical Research Society

50th Annual Scientific Meeting

15 November 2013
Adelaide, South Australia

Basil Hetzel Research Institute
Queen Elizabeth Hospital
Welcome

Welcome to the 50th Annual Scientific Meeting.

Today we have 16 ten minute oral presentations, 6 short oral presentations and 6 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 Therese 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 Therese 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, Julie or Therese.

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
Chair: Professor Leigh Delbridge
Convenor: Professor Guy Maddern
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### Provisional Program
**Surgical Research Society 50th Annual Meeting 2013**
Friday 15 November 2013
Basil Hetzel Institute, The Queen Elizabeth Hospital
Chair, SRS: Leigh Delbridge
Convenor: Guy Maddern

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| 09:10 | **Guest Speaker - SUS Visitor, David J. Hackam, MD, PhD FACS**

Watson Family Professor of Surgery / Associate Dean for Medical Student Research / Professor of Surgery, Cell Biology and Physiology / University of Pittsburgh School of Medicine / Attending Pediatric Surgeon / Co-Director Fetal Diagnosis and Treatment Centre / Children’s Hospital of Pittsburgh of UPMC

Small cells for small patients: The interaction of the innate immune system with intestinal stem cells in the pathogenesis and treatment of necrotizing enterocolitis.

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| 09:30 | 1. David Liu 4. Kheng-Seong Ng  
2. Alexander Cameron 5. Benjamin Wan  
3. Rory Coupland |
| 10:30 | Morning Tea                               |
| 11:00 | **Session 2**                             |
|       | Chair, Ian Bennett                        |
| 11:10 | **Guest Speaker - AAS Visitor, Dr Chris Breuer**

Professor of Surgery and Director of the Tissue Engineering Program
Nationwide Children’s Hospital, Columbus and Ohio State University

The development of tissue engineered vascular grafts for use in children.

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8. Elliot Dolan-Evans 11. Simon Vun |
12:30  Lunch and **Poster Display**

1.30  **Session 3**  
     Chair, Leigh Delbridge

1:40  **Jepson Lecture - Professor Guy Maddem**  
     Dept Surgery, Queen Elizabeth Hospital, Woodville, SA.  
     "Who cares about surgical research?"

2:00  **Oral Presentations**  
     12. Naseem Mirbagheri  
        13. Peter Stewart  
        14. Omid Ahmadi  
        15. Maryam Nesvaderani  
        16. Yogeesan Sivakumaran  
        (To be presented by 2nd Author Kheng-Seong Ng)

2:50  Afternoon Tea

3:20  **Session 4**  
     Chair, Chris Christophi

3:30  **Short Oral Presentations**  
     17. Adrian Low  
        18. Sam George  
        19. Jessica Lai  
        20. Sioban Fitzpatrick  
        21. Steven Craig  
        22. Bulang He

4:00  Short break

4:10  **Presentation of Young Investigator Award, DCAS**  
     **Award, Travel Grants and Best Poster Award**

4:20  **Summary and Close**
**Biographies**

**David J Hackam**

David J Hackam, MD, PhD FACS  
Children’s Hospital of Pittsburgh of UPMC.

David J. Hackam, MD, PhD, is the Watson Family Professor of Surgery and Professor of Surgery, Cell Biology and Physiology at the University of Pittsburgh School of Medicine, and Attending Pediatric Surgeon in the Division of Pediatric General and Thoracic Surgery and co-director of the Fetal Diagnosis and Treatment Center of the Children’s Hospital of Pittsburgh of UPMC.

In 2011, Dr Hackam was named Associate Dean for Medical Student Research at the University of Pittsburgh School of Medicine. He joined the University of Pittsburgh School of Medicine in the Department of Surgery as assistant professor in 2002 after completing Pediatric Surgery fellowship training in Pittsburgh, and General Surgery training in Toronto.

His laboratory is focused on unraveling the molecular mechanisms that underlie several important surgical diseases, including necrotizing enterocolitis, inflammatory bowel disease and trauma. To this end, he recently discovered that necrotizing enterocolitis – a disease that causes morbidity and mortality in premature infants - is caused by increased expression and signaling of the innate immune receptor toll like receptor 4 (TLR4) within the newborn intestine. His lab has also discovered that TLR4 signaling within the gut leads to secondary lung injury in models of trauma. Hackam has identified a novel class of small molecules that potently inhibit TLR4 activation, and in pre-clinical models these new agents serve both a therapeutic and prophylactic role in NEC as well as other inflammatory disorders. Dr. Hackam’s work has led to the filing of 4 international patents, and has been funded by the National Institutes of Health as well as several industry collaborations. It is hoped that these studies will not only open up new avenues for our understanding of the pathogenesis of necrotizing enterocolitis and other inflammatory disorders, but will also identify novel treatment strategies.

Dr Hackam is passionate about training the next and current generation of clinician-scientists at all levels of training. He is a member of the American Surgical Association and the American Society of Clinical Investigation, and was recently elected President-Elect of the Society of University Surgeons.
Dr Chris Breuer

Dr Chris Breuer  
Professor of Surgery and Director of the Tissue Engineering Program  
Nationwide Children’s Hospital, Columbus and Ohio State University

Christopher K. Breuer, MD, is Co-Director of the new Tissue Engineering Program at Nationwide Children’s Hospital and Director of Tissue Engineering in The Ohio State University Wexner Medical Center’s new Center for Regenerative Medicine and Cell Based Therapies. His clinical and research interests center on bioengineered tissue for use in surgery.

Working with Dr. Toshiharu Shinoka, he was the first in the world to tissue engineer blood vessels and implant them in human infants. Dr. Breuer has many honors recognizing his contributions, including the Jacobsen Promising Investigator Award from the American College of Surgeons which is given to the most innovative young surgical investigator in the country.
Professor Guy Maddern

Professor Guy Maddern
Department Surgery, Queen Elizabeth Hospital, Woodville SA

Over the past 22 years Professor Guy Maddern has developed strong experience and expertise in translational research. Following his three years of clinical and research work in Switzerland and France (1989–1992), he returned to Adelaide in 1993 to take up a University of Adelaide appointment as the R.P. Jepson Professor of Surgery at The Queen Elizabeth Hospital. Since then, Professor Maddern has been invited to lecture, both nationally and internationally, on over 100 occasions; has been awarded the John Mitchell Crouch Fellowship for outstanding research; has authored 22 book chapters; has edited textbooks on the current status of hernia repair in the laparoscopic era, rural surgery, and palliative surgery; and co-authored a textbook on hepatobiliary surgery. In October 1997, he was appointed the Foundation Surgical Director of the Australian Safety and Efficacy Register of New Interventional Procedures–Surgical (ASERNIP-S), which required setting up rigorous scientific assessment platform for new interventional procedures and technologies as they apply to the practice of surgery. This has become a major aspect of evidence based surgical practice, which yields important fruits for the international surgical community.

During 1999 Professor Maddern was awarded the position of Foundation Visitor for the Royal Australasian College of Surgeons Scientific Meeting. He has also been the recipient of a James IV Travelling Surgical Fellowship and a Sims Travelling Fellowship. These awards represent the recognition of Professor Maddern's standing within the international surgical community.

Professor Maddern’s current clinical research is focused on hepatic metastatic and primary tumours and on improvement of operative and ablative treatment options. He is currently Head of Research at the Basil Hetzel Research Institute of The Queen Elizabeth Hospital, and Director of Surgery at The Queen Elizabeth Hospital and Royal Adelaide Hospital.
Maps

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

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

(Stamford Grand to Basil Hetzel Institute, via Tapleys Hill Road, approx. 1.5km)
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.
Growth Factor Receptor-bound Protein 7: A potential therapeutic target for oesophageal cancer?

Liu DSH\textsuperscript{1,3}, Fennell C\textsuperscript{1}, Clemons N\textsuperscript{1,3,4}, Duong CP\textsuperscript{1,2,4}, Phillips WA\textsuperscript{1,2,3,4}

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\textsuperscript{2} Division of Cancer Surgery, Peter MacCallum Cancer Centre, Victoria, Australia
\textsuperscript{3} Sir Peter MacCallum Department of Oncology, University of Melbourne, Victoria, Australia
\textsuperscript{4} Department of Surgery, St. Vincent’s Hospital, University of Melbourne, Victoria, Australia

Introduction
Oesophageal cancer has poor clinical outcomes with limited treatment options. Targeting molecular pathways that are critical for tumour proliferation may facilitate personalised therapies to improve patient outcomes. Growth Factor Receptor-bound Protein 7 (GRB7) is an intracellular adaptor molecule that can interact with multiple signal transduction pathways implicated in cell growth and migration. GRB7 is over-expressed concurrently with the Her2/Neu oncogene in 30% of oesophageal cancers, and is associated with metastatic disease and lower survival. In this study, we evaluated GRB7 as a potential therapeutic target for oesophageal cancer.

Methods
A panel of eight cell lines (Adenocarcinoma: OE19, OE33, OAC-NC1, JH-Eso-Ad1, Flo1. Squamous cell carcinoma; TE7, OE21 and Normal oesophagus: NES) were examined for GRB7 and Her2/Neu gene expression and amplification using RT-qPCR. RNA interference (siRNA) was used to study the effects of GRB7 gene knockdown on cell proliferation.

Results
GRB7 and Her2/Neu gene expression were elevated in OE19 (GRB7: 727 fold, Her2/Neu: 252 fold, \(p<0.001\)) and OE33 (GRB7: 111 fold, Her2/Neu: 26 fold, \(p<0.001\)) cells compared with NES cells. This corresponded to significant GRB7 (OE19: 61 fold, OE33: 6 fold, \(p<0.01\)) and Her2/Neu (OE19: 54 fold, OE33: 4 fold, \(p<0.01\)) gene amplification on chromosome 17q12-21, a region previously reported to be amplified in upper gastrointestinal cancers. Importantly, GRB7 gene knockdown in OE19 cells significantly inhibited cellular proliferation by 57.9% \((p<0.001)\) compared with non-targeted controls. In contrast, GRB7 gene knockdown in OAC-NC1 cells, with normal levels of GRB7 and Her2/Neu expression, did not impair cell growth.

Conclusions
GRB7 gene knockdown specifically inhibits growth of GRB7 and Her2/Neu over-expressing oesophageal cancer cells. GRB7 may be a potential therapeutic target for oesophageal cancer.
A novel therapy targeting Flightless reduces hypertrophic scarring by modulating fibroblast phenotype

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Introduction
Hypertrophic scarring results from an overproduction of collagenous extracellular matrix occurs following injury. In addition to severe disfigurement, scar contracture over time leads to significant disability. Flightless (Flii) is a gelsolin like protein shown to be a negative regulator of wound healing. We demonstrate a Flii neutralising antibody treatment prevents hypertrophic scarring in an animal model due to its effect of fibroblast phenotype.

Methods
A model of hypertrophic scarring was applied to wild type, Flii knockout and Flii overexpressing mice. Resulting scars were analysed for scar severity, as well as key determinants of scarring using histological and immunohistochemical techniques.

Flii neutralising antibody was applied to the murine model of hypertrophic scarring. Treated scars were compared IgG treated controls using in terms of scar severity and other key determinants of scarring.

In vitro studies were carried out using primary fibroblast cultured from human and murine skin in order to determine the cellular basis for the observed treatment effect.

Results
Scarring scarring was significantly reduced in Flii knockout mouse compared to wild type and increased in Flii overexpressing mice at both 28-days and 56- days. Scarring was significantly reduced in mice treated with Flii neutralising Ab.

Reducing Flii in vitro modulated the phenotypic change of fibroblasts to myofibroblasts.

Conclusions
Flii appears to be a key regulator of hypertrophic scarring. Treatment with Flii neutralising antibody treatment led to a significant improvement in scarring in a murine model. This effect appears to be due to an effect on fibroblast-myofibroblast phenotype. Flii neutralising monoclonal antibody therapy represents a promising candidate for a novel treatment for hypertrophic scarring.
Influence of sphincter preservation on health-related quality of life following rectal resection: a comparative study

Coupland RA\textsuperscript{1}, Ng KS\textsuperscript{1}, Nassar N\textsuperscript{1,2}, Gladman MA\textsuperscript{1}

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

Introduction
Previous studies comparing health-related quality of life (HRQOL) following abdomino-perineal excision of rectum (APER) and anterior resection (AR) have demonstrated inconsistent results. Bowel function following AR is highly variable and previous studies have failed to make comparison according to functional outcome, which might explain this inconsistency. Therefore, this study aimed to compare HRQOL of patients following APER to subgroups of patients after AR, stratified according to type of bowel dysfunction.

Methods
A cross-sectional study of consecutive patients who underwent APER / AR at a tertiary centre (2001-2011) was performed. HRQOL was assessed subjectively by elucidating patient satisfaction with their stoma and objectively using the validated SF-36. These measures were compared to patients who underwent AR stratified by those with and without evacuation and/or storage dysfunction.

Results
Of 54 patients identified, 39 (72.2\%) participated (23M, 69yrs). Over two-thirds (69.2\%) reported satisfaction with their stoma and only one-quarter (25.6\%) felt that life with a stoma was worse than originally expected. SF-36 scores were lower following APER compared to those undergoing AR and with normal post-operative bowel function (mental composite scores [MCS]: 47.4±13.9 vs. 55.4±8.0, P<0.01; physical composite scores [PCS]: 42.9±12.6 vs. 48.6±11.1, P<0.05). However, SF-36 scores following APER were similar to AR patients with post-operative evacuation and storage dysfunction (MCS: 47.4±13.9 vs. 49.9±10.6, P=0.4; PCS: 42.9±12.6 vs. 44.9±10.1, P=0.3).

Conclusions
The majority of patients are satisfied with their stoma following APER. HRQOL outcomes are potentially superior following AR compared with APER, but only if normal post-operative bowel function is achieved.
Electrophysiological characterisation of human visceral afferent nerves: first in man

Ng KS1,2, Montes-Adrian NA2, Mahns DA3, Gladman MA1,2

1 Academic Colorectal Unit, Sydney Medical School - Concord Hospital Campus, University of Sydney, NSW, Australia. Email: m.a.gladman@sydney.edu.au
2 Enteric Neuroscience & Gastrointestinal Research Group, ANZAC Research Institute, University of Sydney, Australia
3 Department of Integrative Physiology, School of Medicine, University of Western Sydney, NSW, Australia

Introduction
During the last decade, abnormal afferent activity gained recognition as being important in the development of functional gastrointestinal disorders. Since it is not possible to directly measure visceral afferent activity ‘in vivo’ in humans, in this study we aimed to make direct electrophysiological recordings (in vitro) from extrinsic afferents supplying the human colon and rectum.

Methods
Sections of normal rectum and colon were procured from anterior resection and right hemicolectomy specimens, respectively. Sections were pinned flat and mesenteric nerves dissected. Extracellular visceral afferent nerve activity was recorded. Neuronal responses to chemical (capsaicin and ‘inflammatory solution’ [IS]1) and mechanical (Von Frey probing) stimulation were recorded and quantified by determining peak firing rates [range] in one-second intervals.

Results
21 nerves were studied from six rectums. Of these, spontaneous afferent activity was recorded in 18 nerves. Peak discharge rates increased significantly following capsaicin (7 [4-25] spikes/sec vs. 3 [2-6], P=0.001) and IS (5 [3-18] spikes/sec vs. 4 [3-12], P=0.003) application. Punctate mechanosensitive ‘hot-spots’ were identified in 11 nerves (threshold 2.0g [1.4–4.0g]). In six of these, the threshold decreased following IS (1.0g [0.4–1.4g]). By comparison, no ‘hot spots’ were identified and spontaneous activity in only one of 18 nerves studied from five colons.

Conclusions
This is the first study to record from extrinsic rectal afferent nerves and to confirm their chemo- and mechano-sensitivity. Colonic afferents appear less responsive to mechanical stimulation, suggesting differences in electrophysiological characteristics. This technique offers the opportunity to measure electrophysiological properties of extrinsic nerves in disease states.

References
1. 10μM each of histamine, serotonin, bradykinin, and prostaglandin E2, as in Feng B, Gebhart GF. Characterization of silent afferents in the pelvic and splanchnic innervations of the mouse colorectum. Am J Physiol Gastrointest Liver Physiol. 2011; 300(1): G170-80.
Assessing the viability of Donation after Circulatory Death (DCD) donor cardiac allografts for transplantation.


Institution Victor Chang Cardiac Research Institute and St Vincent’s Hospital,
Contact: Benjamin Wan, benjamin.wan@live.com.au, 0424 045 682

Introduction
Use of DCD donors for heart transplantation is limited by warm ischaemic (WI) damage. We aimed to assess the limit of tolerable WI time prior to irreversible damage, and the ability of ischaemic post-conditioning (IPC) strategies to enhance myocardial preservation, in an orthotopic transplantation model.

Methods
In a porcine DCD model, 3 warm ischaemic times (WIT) (20-40 minutes) were evaluated (n=6/group). Post-WI, hearts were flushed with Celsior alone or Celsior with IPC pharmacological agents (glyceryl trinitrate, erythropoietin, zoniporide). Hearts were assessed on an isolated working heart circuit, evaluating functional, metabolic and biochemical parameters of myocardial injury. Viable hearts were subsequently stored for 3.5-4 hours utilizing a clinically approved ex-vivo perfusion device and tested in a porcine orthotopic transplant model.

Results
Compared to control hearts (no WI), hearts exposed to WIT of 30 minutes and IPC strategies demonstrated complete recovery on the ex-vivo circuit (Cardiac Output p=0.18, troponin 0.16, lactate 0.07, myocardial oedema 0.07). IPC treated 30 mins WIT hearts were then validated in an orthotopic transplant model. 7/8 hearts had viable lactate profiles on the OCS, and post-transplant were successfully weaned off CPB, supporting recipient circulation on low-dose inotropes.

Conclusions
Utilising IPC strategies, hearts with WIT of ≤ 30 minutes demonstrated excellent recovery and viability post-transplant in a large animal model. In the present climate of organ shortages, these DCD hearts have the potential to provide an additional source of organs for cardiac transplantation. Studies of human DCD hearts are warranted and currently underway.
Preserved colonic meal response and functional evidence for anastomotic nerve regeneration following anterior resection


1 Institution: Department of Surgery, University of Auckland, New Zealand, Contact: r.vather@gmail.com

Introduction
Symptomatic change in bowel habit following distal colorectal resection is termed anterior resection syndrome (ARS) and may be related to abnormal motility resulting from failure of the myenteric plexus to re-establish across new anastomoses. A key facet of normal motility is the colonic meal response.

Aims
First, to establish whether patients with no symptoms of ARS have a normal colonic meal response; second, to determine whether coordinated pressure wave propagation occurs across colorectal anastomoses in these patients.

Methods
A fibre-optic manometry catheter was endoscopically placed within the distal colorectum of 15 patients (6 males; median age 68y/o) noting the point at which it crossed the anastomosis. A 2-hour baseline period of manometry recording was followed by administration of a 700 kCal meal and a further 2 hours of recording. Data were examined for the presence of retrograde and antegrade propagating sequences (PS). This was compared with data previously acquired from 11 healthy controls (3 males; median age 53y/o) using an identical technique.

Results
Catheter displacement occurred in 3 patients. An increase in postprandial PS activity was observed in patients (p<0.001); this meal response did not differ from controls for retrograde (p=0.324) or antegrade PS (p=0.716). Retrograde and antegrade PS travelled across colorectal anastomoses in 11/12 and 8/12 patients respectively.

Conclusions
Patients without ARS demonstrated a colonic meal response which did not differ from healthy controls. Pressure waves traversed the site of anastomosis in coordination. This provides functional evidence for anastomotic nerve regeneration and restoration of normal motility following distal colorectal resection.
A systematic review of the extra-pancreatic infectious complications in acute pancreatitis


Institute: Pancreas Research Group, Department of Surgery, University of Auckland, New Zealand
Contact: Lisa Brown - l.brown@auckland.ac.nz

Introduction
Extra-pancreatic infectious complications (EIC) in patients with acute pancreatitis has been shown to influence morbidity and mortality\(^1\)\(^-\)\(^3\). Further, on review of the bacteriology of infection of necrosis, close to half of the bacteria are not of enteric origin\(^4\). This raises the possibility of systemic infection as the origin of infection.

The aim of this systematic review was to assess the incidence of EIC in patients with acute pancreatitis, its potential impact and the timing of diagnosis of the infection.

Methods
Search performed of Ovid MEDLINE (1946 to present), Embase (1980 to present) and Cochrane Libraries. Search terms used “Pancreatitis” AND “Infection” AND (“Complication” OR “Outcome”), using PRISMA guidelines.

Results
A total of 1041 papers were screened, with 19 studies included in the final analysis. The studies consisted of two prospective non-RCTs and 17 RCTs. A total number of 1,741 patients with acute pancreatitis were included, with a combined mortality of 10%. The total prevalence of extra-pancreatic infection was 26%, with pneumonia (and other respiratory infections) the most common at 9.2%. Two studies (N=781 patients) reported diagnosis of EIC occurring at median 7.5 days. Compared to pancreatic infection, reported in four studies (N=843 patients) occurring later, at 23.4 days.

Conclusions
Extra-pancreatic infection is a common complication in patients with acute pancreatitis with respiratory infection the most prevalent. EICs are most likely to occur early in the course of acute pancreatitis. Recognition should be made of the occurrence of EIC in acute pancreatitis, with prevention/treatment modalities administered early to curb morbidity and mortality.

References
Medical student interest in surgery – operating at a loss?

Dolan-Evans E, Rogers, G

Institution: Griffith University, Griffith Health Centre - G40, Gold Coast Campus, Griffith University QLD 4222.
Contact: Elliot Dolan-Evans - Elliot.dolan-evans@griffithuni.edu.au

Introduction
There are some concerns that medical student interest in surgery is suffering. The aim of this project was to investigate the proportion of medical students interested in surgery from years one to four, explore influential attitudinal and demographic factors and establish baseline data to study the future effects of the Surgical Interest Association.

Methods
Students were surveyed through an audience response system in year orientation sessions. For a majority of the analyses, respondents were dichotomised based on expressing an interest in surgery or not.

Results
There were no significant differences in the interest students had for a surgical career between medical student year levels or in females versus males in a cross-sectional analysis. However, available longitudinal data demonstrated a significant decrease in surgical interest from first years in 2012 to second years in 2013. Lifestyle, working hours and training length concerns had minimal effects as career influences on students interested in surgery, whilst academic interest and career opportunities were motivating factors in choosing this career.

Conclusions
The results suggested no difference between levels of interest from first to final year students in surgery as a career, though only 22% of final year students were interested in surgery. This study also suggested that promoting the academic and scientific side of surgery, along with career opportunities available, may be an important avenue to encourage students into surgery. Future research should investigate the changing interests of students in surgery longitudinally throughout medical school and to analyse the effects of the Surgical Interest Association.
Mitochondrial and nuclear DNA release is continuous over 5 days following trauma surgery

McIlroy DJ, Bigland M, White A, Hardy BM, Lott N, Smith D, Balogh Z

Department of Trauma Surgery, John Hunter Hospital, University of Newcastle NSW
Zsolt.Balogh@hnehealth.nsw.gov.au

Introduction
Mitochondrial DNA (mtDNA), a potent pro-inflammatory damage associated molecular pattern (DAMP) has been shown to be released in large titres following trauma. We hypothesised that increases in mtDNA would be related to the degree of tissue injury sustained in surgery and would decrease rapidly following surgery in uncomplicated recovery.

Methods
Plasma was obtained from 35 trauma patients who underwent orthopaedic surgical intervention. Sampling was done at 6 peri-operative time points: Pre-op, 7hrs, 24hrs, 3 days and 5 days. DNA was extracted and the mtDNA, nuclear DNA (nDNA) were assessed using quantitative polymerase chain reaction (qPCR). Markers of cell necrosis were assayed including CK (direct skeletal muscle injury/necrosis), LDH and AST (remote secondary liver inflammatory injury/necrosis).

Results
Results show high levels of free plasma mtDNA compared to healthy controls at all time points. Pre-Op - 240ng/ml ± 156ng/ml Post-Op - 158ng/ml ± 103ng/ml 7hrs - 153ng/ml ± 92ng/ml 24hrs - 212ng/ml ± 200ng/ml 3 days – 266ng/ml ± 184ng/ml 5 days – 332ng/ml ± 191ng/ml. MtDNA concentration remained elevated during the 5 days post-operatively. MtDNA was significantly elevated compared to nDNA levels in the study cohort at Pre-Op, 3 day and 5 day time points. No significant correlation was found between DNA levels and markers of cell necrosis (CK, LDH and AST).

Conclusions
Release of mtDNA and nDNA is continuous in the recovery period following trauma surgery. The majority of DNA does not appear to be released by tissues directly injured in the surgical intervention or those injured through secondary inflammatory damage. Increased mtDNA levels could instigate systemic inflammation associated with post-injury surgical interventions. Systemic inflammation could then propagate further mtDNA release creating a self-perpetuating inflammatory process even in uncomplicated recovery.
Adaptation of spatiotemporal gait characteristics following multiple-ligament knee reconstruction

Scholes CJ, Lynch J, Batchen J, Fritsch B, Coolican MRJ, Parker DA

Institution: Sydney Orthopaedic Research Institute,
Contact: Dr Corey Scholes, PH: 02 9904 7182, cscholes@sori.com.au

Introduction
Gait adaptations following knee surgery may have important implications for the risk of accelerated joint wear later in life. The aims of this study were to i) compare the spatiotemporal characteristics of gait in patients with surgical reconstruction of MLKI with healthy controls and ii) test the association between clinical characteristics and gait characteristics in these patients.

Methods
A sample of patients (N = 16) that underwent surgical knee reconstruction with two or more disrupted ligaments were invited to participate. A sample of healthy controls was recruited from the general public that were matched by age, height and weight to each patient. Participants were asked to complete 10 trials walking along a 10m walkway at a comfortable, self-selected pace. Kinematic data was collected using a motion capture system and ground reaction forces were recorded from 2 forceplates embedded into the laboratory floor. Walking velocity, step length, step width, cadence, as well as duration of single and double support were calculated for each trial and compared between patients and controls with group and single-subject statistical analyses. Linear regression was used to associate clinical characteristics (KOOS scores, demographics, injury pattern etc) with spatiotemporal gait data.

Results
Significant (p<0.05) differences were detected for all spatiotemporal variables between patients and healthy controls. However, single-subject analysis revealed that some patients responded differently to others. Linear regression revealed significant (p<0.05) relationships between patient clinical characteristics and gait adaptations.

Conclusions
Patients demonstrated significant gait adaptations following multiple-ligament knee reconstruction compared to healthy controls. The underlying causes of these adaptations appear variable between patients and future work is required to identify the relative contributions of functional deficits and other clinical characteristics on predicting long-term gait adaptations.
Acknowledgements
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of Dr Joe Costa, Mrs Amy Brierley and Mr Laurant Kang for their assistance with patient
recruitment and data collection. We also acknowledge the assistance of Prof Richard Smith
and Mr Ray Patton (University of Sydney) with data collection and setup of the laboratory.
Drug eluting Balloons (DEB) in the tibial vessels: Does it work?

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Introduction
With the increase in type 2 diabetes mellitus and obesity, critical limb ischaemia (CLI) due to tibial disease is becoming more prevalent. The value of angioplasty for below-knee arterial CLI is limited by its’ short term durability. The aim of this study was to ascertain the results of tibial angioplasty with DEBs compared to standard balloon angioplasty (SBA) with primary focus on limb salvage, patency and mortality

Methods
All patients undergoing standard (SBA) tibial angioplasty from 2009-2011 were compared with patients undergoing tibial angioplasty with DEBs from 2012-2013. Over the time period there was no change in proceduralist, risk factor modification and antiplatelet strategy remained the same. Follow was organised prospectively with Duplex at 6 weeks, 3, 6 and 12 months. Mortality, vessel patency and amputations were recorded as primary outcomes.

Results
Complete data is present for 61 patients, 40 patients underwent SBA on 52 tibial vessels with 21 patients receiving DEB angioplasty on 25 vessels. There was no difference in age, gender, risk factors or indications between the groups. Radiological success was 93.2% for all patients. Primary patency at 3, 6 and 12 months for SBA vs DEB was 71.7% vs 79.3%, 50.6 vs 63.2% and 23.2 vs 42.8% (P<0.05 M-W u test). Overall mortality was similar at 41.4 vs 37.5%, there was a trend to a lower amputation rate 19.2 vs 12.7% (P 0.07).

Conclusions
These results suggest that the 12 month patency of tibial vessels is improved with DEB, with a larger group this may translate into a significant reduction in amputation rate at 12 months, offsetting the cost of the DEB.
A systematic review of the impact of sacral neuromodulation on symptoms and anorectal physiological function in patients with faecal incontinence

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Introduction
Sacral NeuroModulation (SNM) has emerged as a treatment option for faecal incontinence (FI). However, its objective effect on symptoms and anorectal function is inconsistently described. This study aimed to systematically review the impact of SNM on clinical symptoms and anorectal physiology in patients with FI.

Methods
An electronic search of MEDLINE (1950-2013) database was performed. Articles that reported the relevant outcome measures following SNM were included. Outcomes evaluated included: frequency of FI episodes, Wexner incontinence score and anorectal physiology (anal pressures and rectal sensation). Review was performed as per PRISMA guidelines.

Results
Of 500 citations identified, clinical and physiological data were extracted from 61 studies. With only two case-crossover and one randomised trial, most studies were case series with heterogeneity of outcome measures reported and physiological techniques employed. Meta-analysis of the data was precluded due to lack of a comparison group in most studies. After permanent stimulation, perfect continence was noted in 36-78% of patients. Most studies reported reduction in weekly FI episodes [median difference of the mean (MDM) -7.5 (range: -24.8 to -2.7)] and Wexner scores [MDM -11 (-14.9 to -6)]. A trend towards improved resting and squeeze anal pressures and a reduction in rectal sensory volumes were also noted in most studies.

Conclusions
SNM improves clinical symptoms and reduces number of incontinence episodes and severity scores in patients with FI, in part by improving anorectal physiological function. However, intervention studies with standardised outcome measures and physiological techniques are required to robustly assess the physiological impact of SNM.
Implementation of standardised surgical equipment setups for common operations to improve efficiency and reduce costs

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Introduction
Previously, there were eight different preference cards for Laparoscopic Appendicectomy and Laparoscopic Cholecystectomy equipment amongst thirteen surgeons in our Acute General Surgery Unit. This caused confusion and incorrect or unavailable equipment in the Operating Theatre leading to time delays, frustration and excess cost due to opened but unused equipment. The objective was to standardise surgical equipment lists for these two common acute operations, in order to improve Operating Theatre efficiency and reduce equipment costs.

Methods
Pre and post introduction surveys of Operating Theatre nursing staff were done assessing satisfaction regarding equipment variability amongst surgeons for these operations. All thirteen surgeons participated in the development of an agreed list of essential single use items for each operation. Two industry suppliers were then invited to prepare the required equipment, and the surgeons voted on their preferred choice. The most competitive price for the preferred kit was negotiated by a medical administrator.
Cost analysis was performed to determine savings on an individual patient and per annum basis.

Results
All thirteen surgeons and all surgical fellows and trainees now use the standardised equipment kit. Satisfaction of Operating Theatre nursing staff has improved. Surgeon satisfaction is adequate. We obtained a 20% and 22% cost reduction on single use items for Laparoscopic Appendicectomy and Laparoscopic Cholecystectomy respectively. This simple standardised approach equates to a minimum annual saving of AU$45,000 on 600 operations per year.

Conclusions
Implementation of standardised equipment for two index acute General Surgery operations has resulted in improved staff satisfaction, efficiency in theatre, and substantial cost reductions.
Influence of age and site of disease on lymph node yield in colorectal cancer

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Introduction
Colorectal cancer (CRC) is a leading cause of morbidity and mortality in Australia and New Zealand. Lymph node yield (LNY) is an independent prognostic factor, regardless of metastatic involvement, and a LNY of 12 or more it the current recommended standard. In this study the effect of patient’s age and site of the disease on LNY is examined.

Methods
A retrospective review of prospectively collected data of patients undergoing elective surgery for colorectal cancer at Dunedin Hospital between 1995 and 2012 was conducted. The relationship between LNY and pathological and demographic variables including age, site of disease, sex and tumour stage was examined.

Results
824 patients were included in this study (mean age: 70.5 years, 49% male, mean LNY 17.9 ± 10.1). A significant but weak negative correlation was present between age at operation and LNY ($r = -0.08; p = 0.024$); which was more pronounced in patients with right sided colon cancer ($r = 0.18; p = 0.001$). In addition LNY was higher for right colon cancers (mean 20.5) than left colon (mean 16.8) or rectal cancers (mean 14.6) ($p<0.001$). After adjusting for pathological and demographic variables, mean LNY reduced by 1 for every 7 years advancement in age.

Conclusions
LNY declines with advancing age and LNY is higher in the right sided colon cancers. More studies are required to examine the immunological role of LNs in CRC and how this may be affected by immunosenescence.
Necrotising fasciitis in Western Sydney

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Introduction
Necrotising fasciitis (NF) is a rapidly progressing subcutaneous tissue infection with high morbidity and mortality. This study describes the epidemiology and outcomes of patients with NF in Blacktown/ Mt Druitt Hospitals (BMDH).

Methods
A retrospective cohort analysis of patients presenting with NF to BMDH from January 2002 – January 2013 was performed. Ethics approval was obtained from the SWLHD Ethics Committee.

Results
There were 39 admissions with NF in the study period. The median age was 59 and 57% were male. Twenty-nine (78%) had multiple comorbidities, commonly diabetes (32%) and obesity (38%). The most common sites of NF were perineum (28%) and lower limb (36%). Polymicrobial infections were found in 72.2% of patients. Median time to surgical debridement was 15.5 hours (range 2-336 h). Twenty-five (64.1%) patients developed complications, commonly septic shock (38.5%) and acute renal failure (30.7%). Eleven (29.7%) patients died. Initial diagnosis in the emergency department was correct in 2 cases, common misdiagnoses were abscess (12) and cellulitis (10). Seventeen (45%) patients were not admitted under a general surgery team and these patients had a 5-fold increased risk of mortality (OR 5.33, 95% CI 1.13-25.12, p=0.0342) and were 28 times more likely to have debridement delayed >20 hours (OR 28.3, 95% CI 4.02-199.6, p <0.05)

Conclusions
NF is a condition with high morbidity and mortality in Western Sydney. The majority of patients had polymicrobial infection and multiple comorbidities. Early diagnosis of NF remains difficult, and patients not admitted under general surgery had increased mortality and delayed time to debridement.
Prevalence of and factors associated with faecal incontinence in the community: A systematic review

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Introduction
Faecal incontinence (FI) is a chronic and debilitating condition with significant health burden. Despite its clinical relevance, the prevalence of FI remains inconsistently described. This study systematically reviewed the literature regarding the prevalence of and factors associated with FI amongst community-dwelling adults.

Methods
A search of electronic databases was performed. Studies that reported the prevalence of ± factors associated with incontinence to liquid/solid stool or flatus in a community-based adult population were included. Two independent assessors reviewed eligible articles. Study quality was assessed using pre-defined criteria. Relevant data were extracted from each study and presented in descriptive form.

Results
Of 3,438 citations identified, 37 studies were included for review. The reported prevalence of FI ranged from 2.0% to 20.7% (males: 2.3%–16.1%; females: 2.0%–20.7%), and increased with age (15–34yrs: 5.7%; >90yrs: 26.8%). However, the studies were heterogeneous in their study population and diagnostic criteria, thus precluding any meaningful pooling of prevalence estimates. Study quality assessment revealed five 'high-quality' studies, of which only three investigated the prevalence of FI in a representative sample of adult community-dwellers; the prevalence of FI reported in these latter studies ranged between 8.3% and 13.2%. The factors most commonly reported to be associated with FI included increasing age, diarrhoea, and urinary incontinence.

Conclusions
FI is a prevalent condition of equal gender distribution affecting approximately 10% of the adult community with identifiable associated factors. The paucity of ‘high-quality’ prevalence studies emphasises the need for future population-based studies that use standardised diagnostic criteria for FI.
Short Oral Presentations
Tendon-bone healing in Anterior Cruciate Ligament reconstruction using an Ovine Model – The influence of graft fixation technique

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Introduction
Early failure of ACL tendon grafts occurs most commonly in the bone tunnels rather than through the intra-articular portion of the graft. This current study compares bone-tendon healing in ACL reconstructions (ACLR) using different fixation techniques - suspensory and aperture fixation.

Methods
ACLR using extensor tendon autograft was performed on 18 month old sheep (n=19) using three fixation techniques. Group A – Suspensory fixation on the femur and screw fixation on the tibia; Group B – screw fixation of femur (outside-in technique) and tibia; Group C - screw fixation of femur (inside-out technique) and tibia. Group C (n=13) were euthanased at 12, 26 and 52 weeks. Group A and B (n=3 each) at 26 weeks only.

Results
X-rays, micro-CT and MRI showed no differences, with particular reference to graft osteointegration, between any groups at any time points. Group A had the highest load to failure in AP translation, followed by group B then C. These were not statistically significant between groups at any time point.

Conclusions
This study was unable to show any differences between three different ACLR fixation techniques. The results are limited by the relatively small numbers of animals utilised in this study. It is apparent that a larger number of animals with longer time points should be considered, probably in excess of 12 months, for future studies that aim to examine tendon-bone healing in an ovine model.
Is CRP a good indicator of anastomotic leak and other septic complications following colorectal anastomosis?

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Introduction
Anastomotic leak and other septic complications are significant complications following colorectal resections. Diagnostic delay significantly contributes to overall mortality/morbidity. CRP is shown to be a good indicator of septic complications. This study was conducted retrospectively and reviewed CRP measurements as an indicator of anastomotic leak and septic complications.

Methods
Data was collected from a prospectively maintained electronic database (2005-2010) in the Department of Surgery, Geelong hospital, Victoria. Statistical analysis was done by the Mann-Whitney test.

Results
595 patients (M: F, 49:51), mean age 65.5 years. Indications for resection: Neoplasms (64.2%), Inflammatory bowel disease (6.1%), Diverticular disease (9.1%), Ischaemic bowel (1.5%) and others (19.1%). Stapled anastomosis was done for 83%, hand-sewn for 14% and 3% was unknown. Septic complications are: anastomotic leak (5.5%), pneumonia (12.1%) and wound infections (12.6%).

The mean post operative day (POD) on which leaks were diagnosed, was Day 7 (3-18). CRP on POD 2 was significant for leak (p=0.035); day 3 neared significance (p=0.065). A notable finding is the negative slope in CRP values common to both patients with and without leak between POD 3-6, highlighted on chart 1. CRP on POD 1-7 was significant for septic complications (p=<0.05). CRP >164.8mg/L on POD 2 identified 87.5% of patients with anastomotic leak (95% CI: 47.4-97.9%), with 70.0% specificity (62.5-76.9%). CRP >95.1mg/L on POD 1 identified 59.4% (40.7-76.3%) of patients with septic complications, and ruled out septic complications in 72.2% (61.8-81.1%).

Conclusions
CRP is a good indicator of colorectal septic complications and possibly leaks. Fall in the CRP levels by Day 5 – 6 can give a false sense of security, in patients with anastomotic leak.
Systematic review of robot-assisted liver surgery

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Introduction
Robot-assisted liver surgery was introduced to potentially improve the outcomes of laparoscopic hepatic resection. The laparoscopic approach was found to be beneficial only in certain types of liver surgery due to its limited freedom of movement and two-dimensional plane of vision. This systematic review aims to assess the perioperative and short-term oncological outcomes of robot-assisted liver surgery.

Methods
Literature search was conducted using Medline and Embase databases for studies published up to August 2013. Case series reporting ≥10 cases were selected. Animal studies, non-English, review articles and conference abstracts were excluded. If multiple studies were published by one centre, the study with the largest number of participants was selected. Study characteristics such as patient demographics, perioperative and oncological outcomes were extracted and means calculated.

Results
Six retrospective case series reporting on a total of 205 patients who underwent robot-assisted liver surgery were included for analysis. Mean operation time was 314.7±90.4 mins and mean blood loss was 568.2mL (range, 10-3500). The conversion and complication rates were 8.3% and 19.4% respectively. The main reason for conversion was bleeding. Overall mortality was 0%. Mean length of stay was 8.4 (range, 2-46) days. Negative surgical margins were obtained in 92.2% of patients.

Conclusions
Robotic liver surgery appears to be a safe and feasible approach to hepatic resection. Extensive randomized studies are needed to compare perioperative outcomes and long-term oncological outcomes of robot-assisted and laparoscopic liver surgery.
The Surgical Interest Association – Promoting surgical research to students

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Introduction
The Surgical Interest Association (Surgia) was formed by Griffith University medical students in 2012 in response to a declining student interest in surgery. This organisation promotes the profession of surgery, by hosting anatomy, skills, academic, professionalism and networking events for over 300 student and 30 professional members. In response to a deficiency in the amount of research and in particular surgical research being performed in the South-East Queensland region, Surgia have put in place various programs and events in order to ameliorate this research deficit.

Methods
As part of a research initiative, Surgia have introduced: Journal Clubs; in-house research projects; a Research Program; a proposed Research Database; and a 2014 Research Conference. The Surgia Journal Club is run quarterly by medical consultants to encourage critical thinking in students and stimulate discussions about interesting research. In 2014, Surgia will expand this program to monthly meetings and establish an online forum to facilitate further discussion. The in-house research is currently conducted by Surgia executive members and includes projects on: anatomy, surgical skills, surgery in rural centres, student interest in surgery and interest in maxillofacial surgery. Surgia are also instigating a Research Program with an established research institute at Griffith University in which medical students can undertake laboratory and clinical research as a ‘Visiting Researcher’ along-side their medical studies, in order to gain experience and publications from their chosen project. Furthermore, due to a lack of communication between interested and capable medical students and surgeons intending to conduct surgical research, Surgia are launching a Research Database. This database will provide a platform for local surgeons to list their current research projects or ideas, and for students to express their interest in the listed research opportunity. Finally, Surgia intend to host a Surgical Research Conference in 2014 to provide notable professionals and Surgia members with the opportunity to present their research and ultimately celebrate surgical research as a crucial enterprise to improving surgical services in our community and establishing South-East Queensland as a hub of scientific knowledge and innovation.
The surgical management of diabetic foot infections in a large regional hospital

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Introduction
Foot infections are a significant source of morbidity in persons with diabetes mellitus, and a growing burden on the Australian health care system (1, 2). To date, there have been few studies on the surgical management of diabetic foot infections (DFI’s) in Australia (3). We performed a retrospective clinical audit of surgically-managed DFIs to determine the operative management and amputation rate for DFI’s, and determine what factors may predict amputation.

Methods
All adult diabetic patients with an inframalleolar infection that required both inpatient antibiotics and surgical intervention at Wollongong Hospital between 01/01/2007 – 31/12/2009 were included. The presence or absence of DFI was defined according to the IDSA Guidelines (4). Only the first presentation for DFI requiring both inpatient antibiotics and surgical intervention was recorded. Data recorded included demographics, clinical presentation, investigations, antibiotics, formal operations, length of stay, and subsequent admissions.

Results
The observed overall amputation rate in this population was 74.7% (68/91 patients) with 20 major and 48 minor amputations. Twenty-one percent of patients who represented underwent amputation. Multivariate analysis showed amputation rate increased significantly with male gender (OR 4.2, CI 95% 1.3-13.4, p=0.014) and WCC (OR 1.42 for each increase of 1.0 x 10^9/L WCC, CI 95% 1.1-1.8, P=0.004).

Conclusions
Our study had a lower rate of overall amputation and major amputation, and a similar rate of minor amputation compared with previous Australian data. The amputation rate reported in this study provides a valuable benchmark for improving the surgical management of DFI in Australia.

References
The first worldwide clinical laparoscopic kidney transplant by extraperitoneal approach

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Introduction
The aim of this study is to develop laparoscopic kidney transplant by extra peritoneal approach. It describes a way of safe transition of the new laparoscopic technique from the laboratory to its clinical application.

Methods
Since December 2009, the safety and feasibility of laparoscopic kidney transplant have been explored by our team. All approvals were obtained from the research ethic committees and hospital medical executive committee. Following the successful animal experiment and establishment of human cadaver models for extraperitoneal approach laparoscopic kidney transplant, a period of training in the pioneering centre using intra peritoneal approach was also attended. The informed consent was signed prior to listing specifically for this new procedure.

Results
In September 2013, one candidate received the pure laparoscopic kidney transplant by extraperitoneal approach. A 6cm Pfannenstiel incision and 3 ports were required. Estimated blood loss was 150 ml. The perfusion of kidney graft was excellent. Much less analgesia was required by the patient. The kidney presented delayed function, but so did the contralateral kidney transplanted by the normal open surgery. Both kidneys started functioning within the first postoperative week. As we write this abstract, the patient is leaving hospital with an excellent outcome.

Conclusions
This is the first clinical case of laparoscopic kidney transplant by extraperitoneal approach. This technique is safe and feasible. The advantages in comparison to the laparoscopic intraperitoneal approach are less risk of ileus and internal herniation, no small bowel adhesion to graft or anastomoses.

Acknowledgement
We acknowledge the staff from large animal facility and CETC for their great contribution.
Circulating endothelial progenitor cells correlate with rCBV\textsubscript{load}, a novel perfusion MRI parametric, in glioblastoma multiforme


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Introduction
Despite the increasing use of anti-angiogenic agents within neuro-oncology, there are still no validated, clinically useful biomarkers to monitor for treatment response or relapse. We investigated the utility of biomarkers of tumour vascularity and angiogenesis in a cohort of glioblastoma multiforme (GBM) patients.

Methods
Pre- and post-operative circulating endothelial cell (CEC) and circulating endothelial progenitor (CEP) cell levels were assessed in patients presenting with GBM. Pre-operative perfusion-weighted MR imaging (PWI) was also undertaken and the relative cerebral blood volume (rCBV) histogram statistics of the tumour were recorded. These biomarkers were then assessed for correlations with patient outcome. Eight healthy volunteers were recruited as controls for endothelial cell analysis. We also developed a novel PWI parametric – rCBV\textsubscript{load} – that estimates the total volume of perfused tumour vessels, and hypothesized that this would correlate with levels of endothelial cell biomarkers.

Results
Nineteen patients with GBM were recruited. Mean pre-operative CEC concentration was significantly higher than the control group (p = 0.0114). Pre-operative CEP concentrations showed a significant and strong positive correlation with rCBV\textsubscript{load} (r\textsubscript{s} = 0.846; p = 0.0003). None of the biomarkers investigated showed any significant correlation with progression-free or overall survival.

Conclusions
CECs are elevated in GBM patients prior to treatment. Endothelial cells and PWI are potentially useful biomarkers of tumour vascularity, a view that is supported by a significant correlation between CEPs and our novel PWI parametric, rCBV\textsubscript{load}. Biomarkers of tumour vascularity were not shown to have any prognostic value in this cohort of GBM patients however.
Accelerating liquefaction of pancreatic necrosis


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Introduction
Current treatment of necrotizing pancreatitis favours minimally invasive approaches with the use of percutaneous drains, however, a large proportion of patients require conversion to open surgery. The ability to accelerate liquefaction of necrotic tissue using both commercially available and novel enzymes to enhance drainage is one method of improvement.

The aim of this study was to firstly determine the components of human pancreatic necrosum and subsequently evaluate specific enzymes to accelerate liquefaction of the necrosum.

Methods
Human pancreatic necrosum was collected and evaluated using histological evaluation, immunohistochemistry and Fourier transform infrared spectroscopy (FTIR). A range of known and novel proteolytic agents were tested on the necrosum, and their effects evaluated using biochemical assays and radiographic imaging with CT and MRI.

Results
Human pancreatic necrosum showed a complete absence of normal parenchyma and a dominance of irregularly arranged collagen fibres. The addition of bromelain and collagenase as well as other potential agents, reduced the total protein content of pancreatic necrosum and increased its liquefactive profile. CT and MRI imaging confirmed changes to the tissue structure and composition with these agents.

Conclusions
Collagen dominates the composition of human pancreatic necrosum. There are several proteolytic compounds now identified as candidates for on-going evaluation as agents to assist removal of necrosum and to prevent percutaneous drain blockage.

References
Phenotypic variation of bowel dysfunction following anterior resection: More than a syndrome

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Introduction
The symptom-complex of bowel symptoms following anterior resection is loosely termed ‘anterior resection syndrome’ (ARS), but this syndrome remains sub-optimally defined. This study aimed to comprehensively describe symptoms and characterise phenotypic variability of bowel dysfunction following anterior resection.

Methods
A cross-sectional study of consecutive patients who underwent anterior resection at a tertiary centre (2002-2012) was performed. Outcome measures included: (i) subjective satisfaction and (ii) objective assessment of bowel function using standardised criteria to document individual symptoms of dysfunction and identify patients with evacuation dysfunction, storage dysfunction, or both. Multivariable regression analysis was performed to assess the association between individual symptoms and satisfaction.

Results
Of 476 eligible patients, 338 (71%) participated (199M, 69yrs). Subjectively, one-quarter (26%) of patients were dissatisfied with their bowel function. Objectively, 93% of patients reported at least one symptom of dysfunction. One-half (51%) of patients met criteria for coexisting evacuation and storage dysfunction, 23% described evacuation dysfunction alone and 11% described storage dysfunction alone. Patients with coexisting evacuation and storage dysfunction had lower satisfaction scores compared to patients with no dysfunction (P<0.001). Symptoms of bowel dysfunction associated with dissatisfaction included: toilet revisiting (P<0.001), unsuccessful evacuation attempts (P<0.01), straining (P<0.05), urgency (P<0.001), use of constipating medications (P<0.01) and the need to wear pad/plug (P<0.05).

Conclusions
Individual symptoms of bowel dysfunction are ubiquitous following anterior resection. Phenotypes of dysfunction are identifiable within this heterogeneous entity, with evacuation dysfunction being more prevalent than storage dysfunction. However, the combination of evacuation and storage dysfunction has greatest impact on satisfaction.
Lower gastrointestinal dysfunction following cystectomy

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Introduction
Limited data are available evaluating bowel dysfunction after cystectomy. This is surprising given the close proximity and common innervation between the bladder and rectum. This study aimed to assess rates of bowel dysfunction following cystectomy.

Methods
A cross-sectional study of consecutive patients who underwent cystectomy at a tertiary centre between 2003 and 2013 was performed using a self-administered questionnaire. Patients who underwent concomitant (pelvic exenteration) or subsequent rectal surgery were excluded. Objective assessment (using the validated Vaizey incontinence and Wexner constipation scores) of individual symptoms of bowel dysfunction was performed.

Results
Of 39 eligible patients, 29 (74%) participated (21M, mean 72yrs). The majority of patients underwent cystectomy for bladder cancer (n=23, 80%). Overall, 90% reported at least one symptom of bowel dysfunction, subsequently categorised into symptoms of evacuation and/or storage dysfunction. The most prevalent symptoms were: incontinence to flatus (n=18, 62%), poor stool-flatus discrimination (n=18, 62%), sensation of incomplete emptying (n=15, 52%), unsuccessful evacuation attempts (n=13, 45%), and faecal urgency (n=13, 45%). Eight patients (28%) reported faecal incontinence (to solid and/or liquid stool). The mean Vaizey score of incontinent patients was 10/24 (SD 5). Of those reporting symptoms of constipation, the mean Wexner score was 8/30 (SD 2).

Conclusions
The majority of patients suffer with bowel dysfunction following cystectomy, characterised by disorders of both evacuation and storage of faeces. The exact pathophysiological mechanisms contributing to such dysfunction remains unclear and highlight that these patients would benefit from on-going follow-up and physiological assessment of anorectal function post-cystectomy.
Surgery and climate change

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Discipline of Surgery, University of Adelaide

Introduction

The specific aim of this research proposal is to introduce and defend the new research paradigm of “surgery and climate change.” There is already international recognition of the substantial threat that climate change presents to human health and of the challenges that it poses to health service delivery. The World Health Organization recognised the health significance of climate change in selecting the topic “protecting health from climate change” for World Health Day, April 7, 2008.1 It estimated that climate change and climate change-related natural disasters account for over 60,000 deaths globally per year.2 Along with injury and death from fire, floods and storms, climate change affects human health through effects on food security and safety, vector-borne, rodent-borne and other infectious diseases, thermal stress and psychiatric illnesses among other variables.3 Leading generalist medical journals already feature numerous articles on the wide-ranging existing and projected health effects of climate change. However, the surgical research community is largely silent on the topic of the surgical implications of climate change, especially in Australia. There are no paradigm defining books on the topic and no summary overview articles appear in the world literature summarising the state of knowledge of “surgery and climate change.”


The likely surgical impacts of climate change will be detailed, including a probable increase in burns injuries in some parts of Australia (and the world) from an increased risk of bushfires, as well as trauma injuries arising from extreme weather events. It will be shown as well that surgical practice itself has a greenhouse gas footprint.

References

Can RSA, gait analysis and activity monitoring help redefine rehabilitation protocols after intra-articular lower limb trauma?

Solomon LB, Callary SA, Thewlis, D, Rowlands AV

Introduction
To determine the feasibility and role of RSA, gait analyses and activity monitoring in monitoring fracture patients.

Methods
Two patients with similar 41 B3 tibial plateau fractures were treated by ORIF augmented with impaction bone grafting and instructed to partial weight bear to 10 kg for the first six weeks. Fracture reduction and fixation were assessed by CT. Both patients had tantalum markers inserted intra-operatively to monitor their fracture stability during healing, using RSA. Gait analyses were performed at 1, 2, 6, and 12 weeks postoperatively. Activity monitors were worn for four weeks between the 2 and 6 week appointments.

Results
There were no complications. CT demonstrated that both fractures were reduced anatomically. Gait analysis indicated that Patient 1 bore weight to 60% of body weight at two weeks postoperative and 100% at six weeks. Patient 2 bore weight at 10% of body weight to six weeks and had very low joint contact forces to that time. At 12 weeks however, there was no difference between the gait patterns in the two patients. Patient 1 increased activities of moderate-vigorous intensity from 20 to 60 minutes/day between 2 and 6 postoperative weeks, whereas Patient 2 remained more stable at 20-30 minutes/day. RSA examination at 12 weeks showed that patients were comfortable to weight bear to 80 kg and under this weight the fractures displaced less than 0.4 mm. RSA measurements demonstrated over time fracture migrations of less than 2 mm in both cases. However, Patient 2, who followed the postoperative weight bearing instructions most closely, displaced less (0.3 mm compared to 1.6mm).

Conclusions
This study demonstrates the potential of using a combination of RSA, gait analysis and activity monitoring to obtain an evidence base for postoperative weight bearing schedules during fracture healing.
50th 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)

Are you? (please circle)  Research Supervisor  Research Fellow  Other

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<th>Questions for all attendees</th>
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What changes would you recommend for future SRS meetings?

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Any other feedback?

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Membership Application Form

Please return this Form to the Secretariat, Section of Academic Surgery at the address listed above.

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