NON-OPERATIVE MANAGEMENT (NOM) OF ABDOMINAL GUNSHOT WOUNDS: AN OVERVIEW OF A SINGLE-CENTRE EXPERIENCE

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Background: EAST Guidelines recommendation for NOM of abdominal gunshot wounds (AGSWs):

- Indications for laparotomy include: haemodynamically unstable patients, clinical signs of peritonitis, and patients with unreliable clinical examination (severe head injury, spinal cord injury, severe intoxication and need for sedation or intubation) (Level 1 evidence).
- Routine laparotomy is not indicated in haemodynamically stable patients with AGSWs if the wounds are tangential and there are no peritoneal signs (Level 2 evidence).

Patients and methods: A prospective database including all patients with AGSWs was maintained by the first author. This was retrospectively interrogated. Stable patients with no tenderness or tenderness confined to the wound or wound tract underwent serial abdominal examination. Patients with non-acute abdominal findings with haematuria underwent computed tomography (CT) scanning. Patients with a suspected right upper quadrant (RUQ) bullet trajectory and/or localised RUQ tenderness suggestive of an isolated liver injury also had a CT scan. An unnecessary laparotomy was defined as negative where no intra-abdominal injuries were found, and non-therapeutic was defined as one where an injury was found but did not require any intervention.

Results: See figure below.

Conclusion: AGSWs managed in our centre have low mortality (6.7%) and low unnecessary laparotomy (3.8%) rates. About 25% of AGSWs can be managed initially without laparotomy with success rate of 95.2%. These data further support the EAST guidelines for NOM of AGSWs.

NON-OPERATIVE MANAGEMENT OF ABDOMINAL GUNSHOT WOUNDS: SERIAL EXAMINATION VERSUS ROUTINE CT

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Background: EAST Guidelines recommendation for NOM of abdominal AGSWs:

- A routine laparotomy is not indicated in haemodynamically stable patients with abdominal gunshot wounds if the wounds are tangential and there are no peritoneal signs (Level 2 evidence).
- In patients selected for initial NOM, abdominopelvic CT should be strongly considered as a diagnostic tool to facilitate initial management decisions (Level 2 evidence).
Patients and methods: The prospective database including all patients with abdominal AGSWs from April 2004 to September 2009 who underwent serial clinical examination without CT and those who underwent CT to determine missile trajectory was reviewed.

Results: Eighty-two patients underwent serial clinical examination without a CT scan. One patient failed abdominal observation and underwent a negative laparotomy. Forty-one patients underwent CT scanning to determine missile trajectory. Three patients failed abdominal observations, as follows: 1. CT showed extraperitoneal tract; developed peritonism, 4 small-bowel perforations found at laparotomy. 2. Free fluid with a splenic injury; developed increasing LUQ tenderness with toxicity, had an uneventful splenectomy. 3. Had a non-therapeutic laparotomy. There was no mortality.

Conclusion: NOM of AGSWs is still based largely on the findings from serial clinical examinations. The role of CT needs to be further evaluated.

NON-OPERATIVE MANAGEMENT OF ABDOMINAL GUNSHOT WOUNDS: SOLID ORGAN INJURY
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Background: EAST Guidelines recommendation for NOM of AGSWs:
- Patients with penetrating injury isolated to the right upper quadrant of the abdomen may be managed without laparotomy in the presence of stable vital signs, reliable examination, and minimal to no abdominal tenderness (Level 3 evidence).
- … although there are reports of penetrating wounds to the kidney being managed without laparotomy, it is not possible to make a formal recommendation at this time. Further study on this topic is necessary (No evidence).

Patients and methods: The prospective database including all patients with AGSWs from April 2004 to September 2009 who underwent a CT scan for: (i) RUQ AGSWs; and (ii) haematuria were reviewed.

Results: Eighty-one, 41 and 27 patients underwent CT scanning for RUQ trajectory injury, haematuria, and RUQ trajectory injury plus haematuria, respectively. Seventy-nine liver injuries, 35 kidney injuries and 8 spleen injuries were identified. Three isolated extraperitoneal bladder leaks were also successfully managed non-operatively. In both liver and kidney injuries, half the patients had either simple or complex injuries. Severe grade did not influence the failure rate. The success rates for NOM of liver and kidney injuries were 94% and 91%, respectively. Failure of NOM was based on failed abdominal observation based on serial clinical examinations. Complications related to both liver and kidney injuries were managed utilising interventional radiological techniques (angiography and embolisation, percutaneous drainage, ERCP, sphincterotomy and stenting). There was no mortality.

Conclusion: Selective CT scanning for RUQ trajectory injury and haematuria detects liver and kidney injuries for NOM. Isolated liver and kidney gunshot injuries can be managed safely with success rates greater than 90%.

NON-OPERATIVE MANAGEMENT OF ABDOMINAL GUNSHOT WOUNDS: OUTCOME OF FAILURES
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Background: NOM of AGSWs remains controversial.

Patients and methods: The prospective database including all patients with AGSWs from April 2004 to September 2009 who underwent NOM was reviewed. Patients who failed NOM, i.e. required delayed laparotomy, were reviewed.

Results: Thirteen patients (4.7%) of a cohort of 272 (24.6%) underwent delayed laparotomy. There were 1 negative, 2 non-therapeutic and 10 therapeutic laparotomies. Four patients had hollow-viscus injuries, 2 had diaphragm injuries, 3 had a splenectomy, 2 had a nephrectomy, and 1 had a distal pancreatectomy (some patients had more than one injury). There were no major complications related to the delay

Conclusion: Delay to laparotomy in initially asymptomatic patients, who promptly undergo laparotomy once abdominal observation fails, is associated with minimal morbidity.

LOW-VELOCITY GUNSHOT INJURIES OF THE PANCREAS: AN ANALYSIS OF 219 CIVILIANS TREATED AT A LEVEL 1 TRAUMA CENTRE
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Background: Owing to the anatomical position of the pancreas, traumatic injuries to that organ are relatively uncommon. Morbidity and mortality are closely related to the associated intra-abdominal and vascular injuries.

Aims: This study sought to characterise pancreatic gunshot wound injury patterns, management and subsequent outcome.

Method: A single-centre retrospective review of all patients who sustained a pancreatic injury following a gunshot during the period from January 1976 to December 2009 revealed 219 patients.

Results: Two hundred and nineteen patients (205 male, 14 female) with an average age of 28.6 years (14 - 69 years) and an average relative trauma score of 11.25 (range 0 - 12) were seen following gunshot wounds with pancreatic injuries. Of the patients, 96 (43.8%) presented in shock. Two hundred and eighteen had associated intra-abdominal injuries, 123 (56.2%) having 3 or more such injuries. Fifty-nine patients (26.9%) had associated vascular injuries. Management was drainage alone in 103 patients (43.4%), with 69 (31.5%) requiring pancreatic resection and 43 (19.6%) a damage control procedure.
Complications developed in 148 patients (67.6%), with shock at presentation being highly predictive of developing a complication. Pancreatic complications predominated, followed by abdominal sepsis, disseminated intravascular coagulation and bleeding, respiratory failure and pneumonia. Thirty-one patients developed pancreatic fistulas, 17 of which resolved conservatively. Forty-six (21%) died, the most common causes of death being an early exsanguinating bleed (17 cases) or later development of sepsis (6) and multiple organ dysfunction syndrome (MODS) (14).

Conclusion: Pancreatic injury severity, the surgical management thereof and any postoperative pancreatic complications following a gunshot wound are less predictive of morbidity and mortality than thereof and any postoperative pancreatic complications following a gunshot wound are less predictive of morbidity and mortality than

A PROSPECTIVE STUDY OF ACUTE SERUM AMYLASE LEVELS FOLLOWING BLUNT ABDOMINAL TRAUMA

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Introduction: Some protocols advise the routine use of serum amylase levels in the assessment of blunt abdominal trauma. This prospective pilot study looked at the spectrum of serum amylase levels in patients following blunt abdominal trauma and correlated the levels with the clinical outcome.

Methodology: This was a prospective study. All patients presenting with blunt abdominal trauma from November 2010 to May 2011 had routine serum amylase measured on admission to the accident and emergency department (AE). Standard demographic data were recorded, as well as mechanism of injury, clinical findings and CT or abdominal ultrasound findings, as well as operative findings and/or clinical outcome.

Results: Twenty-five patients were recruited. There were 10 females and 18 males. The average age was 26.6 years. Ten patients were drivers in road traffic accidents, 6 were pedestrians and 6 were assaulted. One patient fell onto an iron bar, 1 fell onto a rock, and 1 was struck by a football in the abdomen. All but 1 patient had a raised serum amylase level. The mean amylase level was 198 µg/ml (range 100 - 3 042 µg/ml). Five patients had an abdominal CT scan. There was 1 pancreatic laceration (serum amylase 340 µg/ml), 1 renal injury and 1 splenic injury. Two patients underwent negative laparotomy. One patient died in AE. The remaining patients were discharged well after a period of in-hospital observation. The average length of stay was 1.5 days, and the longest stay was 4 days.

Conclusion: This small pilot study reveals that serum amylase levels are often elevated after blunt abdominal trauma. The clinical significance of an elevated serum amylase level is unclear. More patients need to be enrolled to establish the clinical significance, if any, of a mildly elevated serum amylase level following blunt abdominal trauma.

DIRECT TRANSFER TO A LEVEL I TRAUMA UNIT IMPROVES SURVIVAL: AN AUDIT OF THE NEW LEVEL I INKOSI ALBERT LUTHULI CENTRAL HOSPITAL TRAUMA UNIT

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Introduction: To audit the performance of a new level I trauma unit and trauma intensive care unit (ICU).

Methods: Data on patients admitted to the level I trauma unit and trauma ICU at Inkosi Albert Luthuli Central Hospital, Durban, from March 2007 to December 2008 were retrieved from the hospital informatics system and an independent database in the trauma unit.

Results: Four hundred and seven patients were admitted; 71% of admissions were inter-hospital transfers (IHT) and 29% direct from scene (DIR). The median age was 27 years (range 1 - 83), and 71% were male. Blunt injury accounted for 66.3% of admissions and penetrating trauma for 33.7%. Of the former, motor vehicle-related injury accounted for 87.4%, with 81% of paediatric admissions due to pedestrian-related injuries. The median injury severity score (ISS) for the entire cohort was 22 (survivors 18, deaths 29; p<0.001). Patients in the DIR group had a significantly higher mean ISS compared with the IHT group (DIR 25, IHT 20; p<0.02). The overall mortality rate was 26.3%. There were 37 deaths (31.1%) in the DIR group and 70 (24.3%) in the IHT group (p=0.19). In patients surviving more than 12 hours the overall mortality rate was 21.1% (DIR 13.7%, IHT 23.5%; p=0.042).

Conclusions: Trauma is a major cause of premature death in the young. Despite a significantly higher median ISS in direct admissions, there was no difference in mortality. Of those surviving more than 12 hours, patients admitted directly had a significant decrease in mortality. Dedicated trauma units improve outcome in the critically injured.

POST-FREY PROCEDURE QUALITY OF LIFE IN SOUTH AFRICANS WITH CHRONIC PANCREATITIS

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Background: The reliability and validity of the European Organisation for Research and Treatment of Cancer’s quality of life (QoL) questionnaire (QLQ-C30, version 3) in clinical studies of patients with chronic pancreatitis (CP) before and after local resection and lateral pancreatico-jejunostomy (LR-LPJ), or the Frey procedure) was endorsed in 1995. This procedure was performed for symptomatic and/or complicated chronic pancreatitis. Poor socio-economic conditions may influence long-term outcome after this procedure.

Objectives: To compare pre- and post-LR-LPJ outcomes using the QLQ-C30 and with outcomes according to a locally developed structured interview.
Methods: A prospective, observational long-term study was conducted. Consecutive adult patients with a confirmed diagnosis of painful and/or complicated CP undergoing the procedure were included.

Results: One hundred and twelve LR-LPJ procedures were performed between March 1995 and February 2009. Sixty-five participants answered the QLQ-C30 and were interviewed at follow-up (months of follow-up: mean 48.7, range 1 - 149). Fifty-two of these answered both instruments within 6 months after surgery, 32 before and after the surgery. Post LR-LPJ there were significant improvements in QLQ global health status (26.6 points, \( p<0.001, n=32 \)) and emotional (15.4 points, \( p=0.015, n=32 \)) and social (21 points, \( p<0.001, n=32 \)) functioning, but not in physical functioning (0.85 points, \( p=0.85, n=32 \)). Their improvement in role functioning was clinically relevant but not significant (15.16 points, \( p=0.11 \)), and the improvement in cognitive functioning was neither clinically relevant (improved 8.32 points) nor significant (\( p=0.25 \)). Overall functional scale scores improved postoperatively in the 32 patients who answered both instruments both before and after the surgery (11.88 points, \( p=0.01 \)). There was a clinically relevant improvement in most symptom scales of the QLQ-C30. Pre- and post-surgical overall symptom scale scores improved by 17.27 points (\( p<0.001, n=32 \)). There were no significant differences in overall functional (0.98 points, \( p=0.75 \)) and symptom (4.2 points, \( p=0.18 \)) scale scores between postoperative (<6 months) and final (minimum of 6 months) visits (\( n=47 \)). There was poor agreement between the QLQ-C30 pain score and the visual analogue scale for pain of the interview (Pearson’s correlation coefficient, \( r=0.5333 \)), and poor correlation between the former and the pain intensity of the latter using Spearman’s correlation coefficient (\( r=0.5228 \)). When evaluating the two measuring instruments with respect to similar domains the outcomes were concurrent (\( \text{ssnl: } p<0.0001; \text{rf: } p=0.0247; \text{ssnv: } p=0.0001; \text{ssal: } p=0.0006 \)).

Conclusion: Significant improvements in most domains of the QLQ-C30 were found postoperatively. For patients (\( n=32 \)) with QLQ-C30 measurements pre-operatively the improvement to last visit was significant for overall function and symptom scale scores, while for patients (\( n=47 \)) with QLQ-C30 measurements postoperatively but within 6 months improvement to last visit was not significant, suggesting that benefits were mostly apparent within 6 months. Apart from pain, there was concurrence between five parameters of the QLQ-C30 and the structured interview.

ANTIRETROVIRAL-RELATED ACUTE PANCREATITIS IN A REGIONAL HPB UNIT

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Introduction: Pancreatitis is about 35 - 800 times more common in the HIV/AIDS population than in the negative population, with a reported incidence of 3.2 - 46%. Highly active antiretroviral therapy (HAART), particularly combinations containing nucleoside analogues, protease inhibitors, non-reverse transcriptase inhibitors and hydroxyureas, are the usual agents implicated. However, the HI virus itself, other pancreateotoxic agents such as antituberculosis drugs, opportunistic infections, chronic liver and biliary diseases, use of illicit substances and hypertriglyceridaemia of HAART may play varying roles in the genesis of pancreatitis in the HIV-infected patient. Although sub-Saharan Africa is heavily impacted on by the HIV/AIDS pandemic, there is a paucity of data on pancreatic disorders in the large HIV/AIDS population on the continent. This report presents a regional South African hepatopancreatobiliary (HPB) unit’s experience.

Methodology: Prospectively collected data on all HIV-positive individuals presenting with acute pancreatitis to the HPB Unit at Chris Hani Baragwanath Academic Hospital from January 2006 to August 2010 were retrospectively analysed. Demographic, clinical, investigational, management and outcome data are presented. HIV status was stratified according to Centers for Disease Control classification, and the severity of pancreatitis was stratified according to the current modified Atlanta Classification.

Results: Twenty-four individuals (14 men, 10 women; median age 39 years, range 26 - 63 years) with HIV or HIV/AIDS were managed for acute pancreatitis during the reference period. Pancreatitis was mild in 13 patients, while 11 presented with severe acute pancreatitis. Acute pancreatitis occurred following commencement of stavudine-containing antiretroviral (ARV) combinations in 16 individuals, and protease inhibitors in combination with stavudine or didanosine in 8. Other associated agents in 17 individuals included antituberculosis agents (5), ethanol use (4), gallstones (3), opportunistic infections (2) and sulphonamide-trimethoprim (3). Acute pancreatitis occurred within 2 months of commencing ARVs in 7 individuals, within 6 months in 8, within 12 months in 5, and after more than 12 months in 4. The median CD4 level in the cohort was 248 cells/\( \mu l \) (range 155 - 658). Nine patients had a symptomatic pseudocyst requiring endoscopic and minimal access drainage and/or debridement. Three patients died of MODS in the severe group, while all the others survived. The median hospital stay was 3 weeks (range 2 - 28). In the survivors, pancreatitis did not recur following change of the ARVs to a less toxic regimen.

Conclusion: Acute pancreatitis was mild in most of the HIV-positive individuals in this analysis. Stavudine-, didanosine- and pentamidine-containing combinations were the commonest agents causing pancreatitis identified in this cohort. Although severe pancreatitis remains highly lethal in patients with HIV/AIDS, local pancreatic complications can easily be managed by minimally invasive means. Nevertheless, acute pancreatitis in the patient with HIV/AIDS can be adequately managed as in the non-HIV-positive population.

THE ROLE OF CLINICAL AND BIOCHEMICAL FACTORS IN PREDICTING THE AETIOLOGY OF ACUTE PANCREATITIS IN AN URBAN SOUTH AFRICAN COHORT IN THE ERA OF HIV

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### Serum amylase and ALT levels in relation to cause of acute pancreatitis

<table>
<thead>
<tr>
<th>Aetiology</th>
<th>Amylase, median (range)</th>
<th>ALT, median (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSAP</td>
<td>1423  (153 - 7500)</td>
<td>587  (60 - 10234)</td>
</tr>
<tr>
<td>AAP</td>
<td>153   (8 - 1323)</td>
<td>30    (8 - 404)</td>
</tr>
<tr>
<td>HIVAP</td>
<td>535   (58 - 2838)</td>
<td>39    (6 - 200)</td>
</tr>
<tr>
<td>HAP</td>
<td>631   (59 - 11144)</td>
<td>36.5  (10 - 101)</td>
</tr>
</tbody>
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* a,b,c p<0.001, * p<0.05.

**Introduction:** The aim of this study was to determine the degree of serum amylase and alanine transaminase (ALT) elevation in relation to the common causes of acute pancreatitis (AP) and to determine their predictive value for gallstone pancreatitis.

**Materials and methods:** A prospectively collected database of 447 AP patients admitted to Addington Hospital, Durban, between 2001 and 2008 was analysed. The relationships between age, sex, admission amylase or ALT and aetiology were studied.

**Results:** Two hundred and seventy-five patients (20 females) were admitted with acute alcoholic pancreatitis (AAP), 81 (18 males) with acute gallstone pancreatitis (GSAP), 48 (20 males) with HIV-associated pancreatitis (HIVAP) and 42 (20 females) with AP due to hyperlipidaemia (HAP). AAP was more common in males, while GSAP, HIVAP and HAP were more common in females (p<0.05). The mean age at presentation was 39 years, with no significant difference in age in relation to aetiology (p>0.05). Patients with GSAP had significantly higher median serum amylase and ALT levels than those with non-biliary causes (table). No significant differences in amylase or ALT were found among the patients with non-biliary aetiology (p>0.05). An ALT of >150 U/l had a sensitivity of 51%, a specificity of 97% and an NPV of 90% for gallstones.

**Conclusion:** Mean amylase levels in patients with GSAP were double those associated with other aetiologies. An elevated ALT was highly predictive of gallstone aetiology. Neither amylase nor ALT were helpful in differentiating the non-biliary aetiologies.

### RETROSPECTIVE ANALYSIS OF PATIENT REFERRALS FOR ERCP

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**Introduction:** Since the initial cannulation of the ampulla of Vater 40 years ago, endoscopic retrograde cholangiopancreatography (ERCP) has evolved from a diagnostic procedure to a therapeutic modality, largely due to the advent of magnetic resonance imaging. However, a substantial number of ERCPs are still performed for diagnostic reasons, not without morbidity and mortality.

The aim of this study was to evaluate the appropriateness of ERCP performed on patients at Steve Biko Academic Hospital and make a quality assessment as outlined by the ASGE and ACG taskforce.

**Methods:** This was a retrospective cross-sectional study. All clinical data and ERCP reports from patient files in Patient Records at Steve Biko Academic Hospital were thoroughly scrutinised along with the biochemistry and radiological investigations. All results were typed into Microsoft Excel tables and appropriately extrapolated. A sample size of 250 ERCPs estimates an accuracy of 5% with 95% confidence.

** Provisional results:** Over the 2-year period 2009 - 2010, 6 093 endoscopies were done; 328 ERCPs were performed over this time period, accounting for 5.4% of all endoscopies done. Currently 79 patients have been analysed: 74 ERCPs were performed (67% females, 33% males); 11% of patients (7/66) were referred with inappropriate indications for ERCP, and 88% (58/66) were appropriately referred; and 37.5% of inappropriate indications for referral revealed normal ERCPs, while 25% revealed pathology. The remaining 37.5% of patients were correctly refused ERCP. Of all ERCPs done 12% had normal findings. Of all normal ERCPs, 78% were in patients with gallstones and obstructive jaundice.

**Conclusion:** We currently have low levels of inappropriate referrals, and our gastroenterology unit exercises astute judgement in performing ERCPs. Our levels of quality assurance are comparable to our counterparts in the developed world. Despite a large number of patients, lack of equipment and a shortage of skilled staff, we are still able to complete a large number of diagnostic ERCPs.

### ACELLULAR DERMAL MATRICES – THE NEXT BIG THING?

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**Background:** Acellular dermal matrices (ADMs) have been extensively used in reconstructive surgery worldwide during the past decade, with good results. They have become one of the standard methods in breast reconstruction, but have not become popular in South Africa mainly due to the limited availability and relatively high cost at R18 000 apiece. Samples of AlloDerm®, the best known of all ADMs, were donated to the Head of the Department of Plastic and Reconstructive Surgery for teaching purposes. Several samples were used for orbital and abdominal wall reconstruction in plastic and general surgery patients. The remaining samples were used in breast reconstructions.

**Aim:** The primary aim is to present our local experience with the product. The lessons learned and useful technical hints could be beneficial to those dealing with breast surgery and reconstruction. A secondary aim is to provide a comprehensive review of the current literature.
Materials and methods: A retrospective chart review of the patients in whom AlloDerm® was specifically used for breast reconstruction was conducted. The product was used in 5 patients and 6 breast reconstructions.

All patients underwent an immediate expander implant-based reconstruction as a two-stage procedure after signing informed consent.

The results of these reconstructions were analysed using clinical and photographic evidence. In particular we assessed the rate of incorporation of AlloDerm® into the recipient’s tissues, functional and aesthetic results and complications specifically related to the product.

Results: All the reconstructions healed well. There were no major complications. Two minor complications, a seroma and minor wound dehiscence, occurred in the breast of one patient. AlloDerm® was completely incorporated into the patient’s tissues: histologically the product was indistinguishable from the patient’s own tissue. The aesthetic results were satisfactory.

Conclusions: In this small series, our experience supports the literature review indicating that AlloDerm® appears to be a very useful product. It is set to become the new gold standard in breast reconstruction.

THE SIGNIFICANCE OF RADIATION EXPOSURE TO SURGEONS DURING A SENTINEL LYMPH NODE BIOPSY

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Introduction: To measure the extent of radiation exposure to a surgeon after injecting 91 patients undergoing sentinel lymph node biopsy with radioactive isotope technetium-99m.

Method: A prospective analysis of 91 patients undergoing sentinel lymph node biopsy who received radioactive isotope technetium-99m over the period 5 January - 20 June 2010.

Results: A total of 91 patients’ exposure rates were collected by placing a thermoluminescent dosimeter (TLD) on the surgeon’s finger. The TLDs recorded the total radiation exposure to the surgeon.

The occupational dose limit for extremity exposure should be less than 500 mSv or 50 rem per year. Once analysed and extrapolated, the data showed an average dose per patient of 0.1110989 mSv.

Conclusion: The number of surgical procedures a surgeon would have to perform to exceed the advised minimum extremity dose limit would need to be over 712 per annum. Only in extreme surgery practices would the minimum dose limit of extremity radiation therefore be exceeded. The findings also reveal that regular measurements of radiation exposure and radiation protective measures need not be undertaken in theatres where surgeons are regularly working with radioactive isotopes.

TRIPLE-NEGATIVE BREAST CANCER AND OTHER SUBTYPES: INCIDENCE AND STAGE OF PRESENTATION IN A COHORT OF PATIENTS TREATED AT CHRIS HANI BARAGWANATH ACADEMIC HOSPITAL

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Introduction: Breast cancer is the most common cancer in females worldwide and the second most common cancer in black South African women. Based on hormone receptor status and expression of human epidermal growth factor receptor, HER-2, distinct breast cancer subtypes are recognised, with different biological characteristics, clinical behaviour and therapeutic implications.

Methods: Data from the National Health Laboratory Service database from January 2007 to September 2010 were reviewed; 648 confirmed cases of breast cancer were analysed. Based on hormone receptor status and HER-2, cancer subgroups were divided into four distinct subtypes, i.e. HR+HER-2+, HR+HER-2-, HR-HER-2+ and HR-HER-2- (triple negative, TNBC). Of the 648 cases, 456 were analysed for pathological stage. Owing to lack of further analysis of equivocal HER-2, i.e. HER-2 2+, this group was considered separately.

Results: The incidences of HR+HER-2+, HR+HER-2-, HR-HER-2+ and HR-HER-2- (TNBC) were 15.28%, 31.33%, 13.73% and 17.28%, respectively. The incidences for the equivocal group comprising HR+HER-2 2+ and HR-HER-2 2+ were 16.20% and 6.17%, respectively. For all combined subtypes 6.70%, 37.37% and 55.93% were stages 1, 2 and 3, respectively. In the TNBC group, 4.41% were stage 1, 42.65% were stage 2 and 52.94% were stage 3.

Conclusion: Triple-negative breast cancer is much higher in our cohort of patients compared with what is reported in literature. In general, our patients present with advanced-stage disease.

TRIPLE-NEGATIVE BREAST CANCER IN SOUTH AFRICA – ANALYSIS OF AN INSURED POPULATION

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Introduction: Triple-negative phenotype breast cancer is an important subtype, as it is associated with poor survival. The aim of this study was to analyse the presentation and outcome of a medically insured population seen and managed by the multidisciplinary team at the Milpark Hospital Breast Care Centre.

Materials and methods: One hundred and sixty-six cases of triple-negative breast cancer seen between October 2000 and June 2010 were collected consecutively and analysed retrospectively. Data were obtained from patient records.
Results: Median age at diagnosis was 50 years. A total of 27 patients (16.27%) were black, 22 (13.25%) were Indian, 2 (1.20%) were coloured and 144 (86.75%) were white; 1 patient's ethnicity (0.60%) was not reported. Sixty-six patients were premenopausal, 10 perimenopausal and 87 postmenopausal; for 3 patients menopausal status was unknown. Tumour size at presentation was determined clinically and/or pathologically: 51 patients (30.72%) presented with T1 tumours, 69 (41.57%) had T2 tumours, 15 (9.04%) had T3 tumours, and 21 (12.65%) had T4 tumours. Tumour size was not reported in 10 patients (6.02%) initially assessed elsewhere. Nuclear grading was unreported for 45 patients (27.11%). Of those reported, 8 tumours (4.82%) were grade 1, 22 (13.25%) grade 2 and 91 (54.82%) grade 3. Nodal status was determined clinically and/or pathologically. There was no lymph node involvement in 80 patients (48.19%), 78 (46.99%) had positive lymph node involvement, and nodal status was unknown in 8 (4.82%).

Eighty-seven patients were treated primarily with surgery and 79 (47.59%) with neo-adjuvant chemotherapy, 52 patients receiving anthracycline and taxane, and 26 anthracycline-based chemotherapy.

In the group treated with neo-adjuvant chemotherapy, information on pathological response was available for 65 patients. There were 26 (40.00%, 95% confidence interval (CI) 28.04 - 52.90%) patients with complete pathological response. There was no statistical difference in the proportion of complete pathological responses between black African and other patients. Menopausal status and tumour size did not impact on complete pathological response. Seven patients (4.22%) died, and follow-up was unavailable for 20 (12.05%).

Conclusion: The data on correlation between tumour size, nodal status and nuclear grading as well as time to progression and survival, and a logistic regression model for this ongoing study, will be reported.

A LOW CD4 COUNT IS ASSOCIATED WITH METASTATIC DISEASE IN PATIENTS WITH HIV AND BREAST CANCER
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Aim: To assess whether CD4 count is related to stage of presentation in patients with concurrent HIV infection and breast cancer.

Method: This was a retrospective evaluation of data of patients with HIV and breast cancer who were evaluated at the Addington Hospital Breast Clinic and IALCH Combined Breast Oncology Clinic. Data for June 2008 - March 2011 were extracted from our database. All patients diagnosed with breast cancer had an HIV test performed as part of the oncology protocol. All patients were referred for voluntary counselling and testing, and post-test counselling was performed by trained staff.

Results: A total of 43 patients with CD4 counts done at the time of diagnosis were identified. When stage at presentation based on the Modified Manchester Staging was assessed, 10 (23.3%) patients with stage 2, 25 (58.1%) with stage 3 and 8 (18.6%) with stage 4 cancer were identified. In the stage 2 cohort the average CD4 count was 321 cells/µl (range 130 - 779), in the stage 3 cohort it was 469 cells/µl (range 88 - 1 309), and in the stage 4 cohort it was 253 cells/µl (range 140 - 360). Of the 43 patients identified, 7 were already on ARV therapy; 2 were in stage 2 and 5 were in stage 3, with an average CD4 count of 412 cells/µl (range 220 - 832).

Discussion: It appears that a lower CD4 count is associated with metastatic disease. Whether the low CD4 count contributes to the progression to metastatic spread, or is a result of HIV infection and co-infection with metastatic breast cancer, will be difficult to prove. Independent predictors of mortality after...
cancer diagnosis among HIV-infected persons include poor immune status, failure to suppress HIV RNA on combination ART, cancer stage, and lack of cancer treatment;’ (AIDS, December 2010). Until HAART was available, the competing risks for death from AIDS prevented development of some non-AIDS-defining cancers. However, the advent of improved treatment has dramatically increased the lifespan of people with HIV, and we now have an ageing HIV-positive population with improved survival. An elevated CD4 count and ARV therapy are associated with a better response to therapy and fewer complications of therapy, as reported by the limited articles published (although patient numbers are small). ARV therapy may play a role in protecting against metastatic spread, by strengthening the immune system. In an updated analysis from the DAD study, fatal non-AIDS-related cancer was more common than AIDS-defining cancer among patients on potent ARV therapy. CD4 cell count did influence rates of death from non-AIDS-defining cancer (relative risk 15 for CD4 counts <50 v. >500 cells/μl). After adjustment for other factors, the latest CD4 cell count predicted risk for non-AIDS-defining events (ACC, April 2007).

Cumulatively, these results indicate that we need to broaden our view of what constitutes HIV-associated cancers, both in clinical trials and in practice. ARV therapy should be offered to all patients with HIV and breast cancer, irrespective of CD4 count, to improve the outcomes of patients with these two life-threatening diseases.

THE VALUE OF THE INITIAL SYMPTOM AND DEMOGRAPHIC FEATURES IN PREDICTING BREAST CANCER
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Introduction: Breast cancer is the most prevalent cancer among women, with an incidence of 123.8/100 000 women per year reported. No screening programme for breast cancer is available in South Africa, and special investigations are located at referral centres such as Steve Biko Academic Hospital (SBAH). Long waiting periods apply to general surgery clinics. A model unaffected by healthcare worker interpretation will help identify patients who need to be seen urgently.

Methods: Female patients were recruited from the surgical outpatients at SBAH. Information focusing on presenting complaints was obtained via a questionnaire. Where more than one complaint was present it was recorded as such. The results of special investigations were followed. At completion a clinical prediction rule will be developed by a logistic regression.

Preliminary results: So far 136 patients have been recruited. Eighty patients had sufficient data to analyse, of whom 23 had breast cancer (28.75%). The most prevalent presenting complaints were a painful lump (35/80) and lumpiness of breasts (34/80). The average ages for benign and malignant disease were 47.54 years (standard deviation (SD) 16.13) and 55.78 years (SD 11.59), respectively. Malignancy rates were highest in association with worrisome complaints combined with age predict the highest rate of malignancy.

Conclusion: Final results and logistic regression will be possible once all results are available. Interim results suggest that worrisome complaints combined with age predict the highest rate of malignancy.

RETROSPECTIVE ANALYSIS OF 420 PATIENTS UNDERGOING BILATERAL MASTECTOMIES FROM ONE BREAST CENTRE IN JOHANNESBURG
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Introduction: There is an international trend for women to elect to have bilateral mastectomies when diagnosed with unilateral breast cancer. There is a similar trend in our South African unit. To determine the possible oncological outcomes of this procedure, a retrospective records review was carried out in the unit. The aim was to determine the rate of pathology on the contralateral side in patients undergoing bilateral mastectomies for proven breast cancer.

Method: A retrospective records review of data for all breast cancer patients undergoing bilateral mastectomy at this centre was done. Data collected from the patients’ files included demographics, clinical history, radiological reports, histopathology including initial core biopsy and final histology, operative records including oncological procedure and reconstructive procedures performed, and any adjuvant treatments given. This was a subset of data from a proposed larger study of bilateral mastectomies. It focused primarily on the histopathology of the final contralateral specimens.

Results: Four hundred and twenty patients were identified. In the preliminary data analysis of 136 patients, 4 (2.9%) were found to have a previously undiagnosed contralateral invasive tumour. Pre-invasive lesions were found in 6 patients (4.4%) with ductal carcinoma in situ. Lobular carcinoma in situ was found in 6 patients (4.4%). High-risk lesions including atypical ductal hyperplasia, papillomatosis and sclerosing adenosis were found in 26 patients (19%). Forty-four patients (32%) had benign breast pathology (fibrocystic disease), and the rest had no abnormalities in the contralateral breast.

Conclusion: International data suggest that less than 2% of contralateral specimens will contain an invasive breast cancer. We found a rate of nearly 3%, rising to 7.3% invasive and pre-invasive lesions. This is a rate far higher than in the breast cancer literature, and we believe that it validates bilateral mastectomy for patients unwilling or unable to continue close screening due to many factors including personal choice.

Despite our use of advanced pre-operative diagnostic tools, a significant amount of pathology is not identified pre-operatively. The number of high-risk lesions that would have required surgery had they been diagnosed before the mastectomy was 23.4%, in addition to the cancer and pre-cancer lesions. This number is higher than current international data.
Sub-Saharan Africa is the region of the world worst affected by HIV-AIDS. More interventions to manage this pandemic are urgently required. Oral transmission of HIV-AIDS is rare, and the role of saliva and its mucus in this inhibition requires clarification.

This project sought to verify statistically the findings of Habte et al. (2006) that crude HIV-negative saliva and its purified mucins MUC5B and MUC7 inhibit the infection of HIV-1 in an in vitro assay, as opposed to those from HIV-positive subjects.

Mucus was extracted in 4M guanidinium hydrochloride and a cocktail of protease inhibitors, pH 6.5. Sepharose CL-4B gel filtration separated MUC5B and MUC7 in saliva, and mucins were purified by density-gradient ultracentrifugation in caesium chloride. SDS-PAGE analysis and Western blotting determined the size, purity and identity of the mucins. The inhibitory activity of crude saliva and purified MUC5B and MUC7 from HIV-negative (n=20) and HIV-positive (n=20) donors was tested by their incubation with subtype C HIV-1 and infection of peripheral blood mononuclear cells.

The presence of MUC5B and MUC7 in saliva was confirmed, and it was shown that there was inter-individual variation in their amounts. MUC5B from the HIV-positive group was of a smaller size, while MUC7 had larger amounts of small proteins associated with it in this group. DNA analysis of the tandem repeat regions of MUC5B and MUC7 revealed no difference between groups. Crude HIV-negative and HIV-positive saliva and its purified mucins MUC5B and MUC7 significantly inhibited the infection of HIV-1 in an in vitro assay.

MUCINS IN PSEUDOMYXOMA PERITONEI

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Background: Pseudomyxoma peritonei (PMP), a very rare disease, is characterised by copious intraperitoneal mucinous ascites containing huge globules of extracellular mucus accumulating in the abdominal cavity, contributing to the morbidity and mortality of the disease.

Aim: According to the literature, MUC2 and some MUC5AC, a colonic and a gastric mucin respectively, are the predominant mucins in the fluid of PMP patients. We wished to determine whether material from patients with PMP contained other mucins that could contribute to the very high viscosity of the secretions and contribute to the morbidity of the disease.

Results: In the male patient, Western blot analysis (confirmed by immunohistochemical analysis) after agarose gel electrophoresis showed the presence of MUC2, MUC5AC and MUC5B in the mucus. There was no MUC1, MUC1core (MUC1c) and MUC6 in the tissue. Histopathological examination confirmed a mucinous appendicular adenocarcinoma. Histological examination showed the mucins to be predominantly of the sulphated and non-sulphated acidic type. Serine, threonine and proline comprised 21.6% of the total amino acid composition of the sample. The viscous nature of the material is due to the presence of three gel-forming mucins and possibly to its high content of protein.

In the female patient, the cells expressed both sulphated and non-sulphated acidic mucins. The presence of MUC2, MUC5AC, MUC5B and a-1-acid glycoprotein was shown by Western blotting and MUC4 by immunohistochemical staining. MUC1 and MUC6 were not detectable in the tissue.

Conclusion: There are many more mucins present in material from PMP than MUC2 and MUC5AC. We have reported for the first time the presence of MUC5B, a gel-forming mucin, and MUC4, a trans-membrane mucin, in PMP. Further studies are being done to adequately solubilise this fluid from PMP patients so as to be able to perform further biochemical studies on it.

THE ROLE OF CRUDE SALIVARY MUCUS AND ITS PURIFIED MUCINS MUC5B AND MUC7 IN THE INHIBITION OF THE HIV-1 VIRUS

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Methods: Mucus was extracted and solubilised by stirring in 6M guanidinium chloride and a cocktail of protease inhibitors (1:5). Mucins were purified by density gradient in caesium chloride (CsCl) and 4M guanidinium hydrochloride (GuHCl). Western blotting analysis was used to identify the mucins in human breastmilk, and amino acid composition was determined by high-performance liquid chromatography. An in vitro HIV-1 p24 antigen assay was used to determine the inhibition activity of the crude milk and purified mucins.

Results: Mucins were purified successfully by density gradient ultracentrifugation in CsCl. SDS-PAGE showed a group of high molecular weight bands in the stacking and running gels for the HIV-negative group (previously reported to be MUC4 and MUC1), while the HIV-positive group showed only one band in the region of MUC4. The signature amino acids were confirmed as 11% threonine, 11.2% serine and 14.8% proline. When HIV-1 was incubated with crude breastmilk samples from normal and HIV-infected individuals, there was positive expression of the p24 antigen. In both cases crude breastmilk did not inhibit the

THE ROLE OF HUMAN BREASTMILK MUCUS AND MUCINS IN HIV-AIDS

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Introduction: The HIV-AIDS pandemic is prevalent in sub-Saharan Africa. Human breastmilk mucus contains biologically active compounds such as mucous glycoproteins (mucins), which protect breastfed infants from bacteria, viruses and toxins. However, breastfeeding is a known risk factor, with transmission from mother to child being as high as 40%. The aim of this study was to determine the antiviral activity of crude breastmilk and its purified mucin components, namely MUC1 and MUC4, against HIV-1 in HIV-positive patients (n=21) compared with those who were not infected (n=21), using an HIV-1 p24 antigen assay.

Methods: Mucus was extracted and solubilised by stirring in 6M guanidinium chloride and a cocktail of protease inhibitors (1:5). Mucins were purified by density gradient in caesium chloride (CsCl) and 4M guanidinium hydrochloride (GuHCl). Western blotting analysis was used to identify the mucins in breastmilk and amino acid composition was determined by high-performance liquid chromatography. An in vitro HIV-1 p24 antigen assay was used to determine the inhibition activity of the crude milk and purified mucins.

Results: Mucins were purified successfully by density gradient ultracentrifugation in CsCl. SDS-PAGE showed a group of high molecular weight bands in the stacking and running gels for the HIV-negative group (previously reported to be MUC4 and MUC1), while the HIV-positive group showed only one band in the region of MUC4. The signature amino acids were confirmed as 11% threonine, 11.2% serine and 14.8% proline. When HIV-1 was incubated with crude breastmilk samples from normal and HIV-infected individuals, there was positive expression of the p24 antigen. In both cases crude breastmilk did not inhibit the
HIV-1 virus from causing infection to cells, while purified mucin inhibited the virus when the virus was incubated with purified breast mucins.

Conclusion: Crude breastmilk does not inhibit HIV-1 in an in vitro assay, while purified mucins do.

‘RSI WITH SUXAMETHONIUM IS A GOOD CHOICE IN HEAD INJURY PATIENTS, BUT IT CANNOT BE USED IN UNREFRIGERATED ENVIRONMENTS’ – HAS THIS STATEMENT BEEN WRONG THE WHOLE TIME?

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Background: The most frequent reason for intubation in the trauma patient is a decreased Glasgow Coma Score (GCS) due to brain injury. This procedure can effectively be done using rapid-sequence induction (RSI), with reduced gagging, smoother intubation, and less blood pressure lowering (from sedation) all being touted as advantages to using paralysis. Suxamethonium is an ideal drug for RSI in this situation; however, it is considered a refrigeration-line drug, which obviates its use in the very environments it is needed in most – the pre-hospital and rural clinic environments, where refrigeration is often not available.

There is some literature, reporting studies using laboratory-controlled environments and constant temperatures for the pharmaceutical industry, which shows that unrefrigerated suxamethonium can last 4 - 12 weeks. These studies did not address the real-world environment – i.e. where temperatures fluctuate daily and according to season, and well as depending on the vehicle/room the drug is kept in.

Aim: To ascertain the unrefrigerated shelf-life of suxamethonium in a ‘real-world’ environment and thus whether it would be feasible for paramedics and rural clinic doctors to stock unrefrigerated ampoules of this inexpensive drug in their respective environments.

Methods: Three sample environments (a light-coloured car, a dark-coloured car, a shelf at room temperature) and one laboratory control environment were set up. Each week, an ampoule from each environment was tested in an analytical laboratory using thin-layer chromatography to look for breakdown products, as well as by infrared spectrophotometry to compare its degradation in relation to the control. In addition, temperature data loggers were placed together with the samples in each test environment to record the temperature every hour. We intended to record these measurements throughout the year to enable establishment of a formula to determine the period of usable drug during any specific time/season of the year.

Results: Two test batches were run: (i) the first batch was run predominantly in the colder months; and (ii) the second batch was run predominantly in the warmer months. The results were remarkable. During the entire first batch, there was no decay below 91.86% (suggesting acceptable efficacy of the drug) up to 117 days, or 16½ weeks. During this time 3 240 temperature measurements were taken, with mean kinetic temperatures of 20.07°C, 23.33°C and 22.88°C for the shelf, dark car and light car, respectively. The second batch ran for 140 days with only the ‘light car’ batch showing 87.87% correlation after accelerated degradation testing. The others remained above the 90% threshold (94.84% and 91.85%).

Conclusions: Contrary to what has been assumed, if the evidence of this study is able to prove that suxamethonium is stable in the unrefrigerated environment for an extended period (3 - 4 months), the drug can be used in many environments (e.g. pre-hospital) where it was previously not used owing to lack of refrigeration. In addition, because the temperature of each environment is closely monitored over the year, a formula can be devised to determine a new ‘unrefrigerated’ expiry date.

A PORCINE MODEL USED TO ASSESS THE EFFICACY AND SAFETY OF A TRADITIONAL MEDICINE FOR WOUND HEALING

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Introduction: A plant derived from traditional knowledge has been reported to improve wound healing, but there have been reports of hepatotoxicity from the plant species in question. A pilot study was set up to determine the plant's efficacy and safety.

Methods: Twelve deep partial-thickness wounds (DPT) (2.5 cm × 2.5 cm × 800 µm) were created with a dermatome. Wounds were treated with plant preparation, activated carbon or occlusive dressing alone and observed for 16 days.

Biopsies taken for histological examination on prespecified days were sectioned, stained with H&E and photographed, and the epidermal thickness was measured and expressed as a ratio. Further analysis using immunofluorescent staining techniques and digital image analysis was employed to quantify cellular proliferation (PCNA) and tyrosine phosphorylation (4G10) in the neo-epidermis and granulation tissue areas. Other variables include in-theatre pH measurements, inflammatory cytokine analysis, and hepatotoxic events.

Results: The plant-treated wounds showed a peak in epidermal thickness by day 7 compared with day 9 in both control groups. PCNA and 4G10 investigations indicated high levels of proliferation linked to tyrosine phosphorylation. Cytokine investigations indicated modulation of their expression by the plant compared with the controls. pH values in all treatment groups followed a similar trend, but a significant difference was noted at day 2 in the plant-treated groups. No sign of hepatotoxicity was detected.

Conclusion: The plant in question was efficacious in accelerating wound healing, with no hepatotoxic events. The variables considered were affected to various degrees as seen in the data provided.
HYDROXYAPATITE-COATED ALLOPLASTIC IMPLANT FOR AURICULAR RECONSTRUCTION
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Background: Autogenous cartilage remains the gold standard for ear reconstruction, but alloplastic materials are also utilised. These save theatre time and are less technically demanding. High-density porous polyethylene (Medpor®) is the closest to ideal alloplastic material on the market for ear reconstruction, but it is costly and long-term durability remains open to interpretation. A combination of two FDA-approved materials, hydroxyapatite (to make the prosthesis more bio-active) and polyurethane (softer and more flexible construct), was tested against the ideal characteristics for an alloplastic material.

Method: A hydroxyapatite-coated polyurethane (HAPU) disc, 1.5 mm × 2 cm, and a Medpor® disc (control) of similar dimensions were gamma-sterilised. The prostheses were implanted into subcutaneous pockets of a Wistar rat's abdominal wall. Four groups (15 rats each) were operated on consecutive days, using two implants per rat, HAPU (n=60) and Medpor® (control) (n=60). The individual groups' prostheses were harvested at 3, 6, 12 and 24 weeks. All the implants and capsules evaluated were macroscopically and histologically as well as microbiologically evaluated.

Results: No major complications were seen in the experimental or control groups. Macroscopically both implants demonstrated good three-dimensional appearance, which was well retained up to 24 weeks. The HAPU prosthesis had a thin fibrotic capsule surrounding it with no tissue attachment and a dry surface underneath, whereas tissue ingrowth into Medpor® was completed at 6 weeks and the capsule was difficult to separate from the prosthesis. No statistical difference was seen for subclinical infection. On histological analysis, foreign body debris and giant cell appearance were statistically higher in the experimental than the control group.

Conclusion: This study showed that both implants were equally biocompatible and durable, although the tissue response was totally different. The experimental prosthesis has two disadvantages: firstly the lack of tissue attachment or ingrowth, which might cause a problem of prosthesis migration in the clinical scenario, and secondly that any shaping of the HAPU prosthesis intra-operatively will cause a bare uncoated area that will change its biocompatibility.

EVIDENCE FOR AN ENDOCRINE SIGNALLING PATHWAY IN REGENERATION OF RENAL TUBULES
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Introduction: Acute renal failure following acute tubular necrosis (ATN) is not uncommon. Recovery from ATN depends to a large extent on the rate of regeneration of the renal tubular epithelial cells. Several growth factors have been implicated in the initiation and modification of the regenerative response in renal tubules. However, whether these growth factors act in an endocrine or paracrine fashion remains unresolved. The aim of this study was to investigate whether growth factors act in an endocrine or paracrine mechanism in regeneration of the renal tubules.

Methods: Long-Evans rats weighing 250 - 300 g were anaesthetised with isoflurane and subjected to a midline laparotomy. The right kidney was dissected and the renal pedicle clamped for 90 minutes. At the end of the ischaemic period the pedicle was unclamped and the abdomen closed. The left kidney remained untouched. Groups of animals were killed at 0, 24, 48, 72 and 96 hours postoperatively and both kidneys were removed and fixed in formalin. The kidneys were subjected to histological (mitotic index, MI) and immunohistochemical (Ki 67 labelling index) assessment.

Results: There was a significant increase in the MI from 0 mitoses/hpf at baseline to 111 mitoses/hpf at 48 hours in the right (ischaemic) kidney. The MI in the left (normal) kidney also increased, from 0 mitoses/hpf at baseline to 1.4 mitoses/hpf at 48 hours. There was a significant increase in the Ki 67 from a baseline of 0.6 to 26 at 48 hours in the right (ischaemic) kidney. Similarly, there was an increase in Ki 67 from a baseline of 0.6 to 7.5 at 48 hours in the left (normal) kidney.

Conclusion: We were able to demonstrate a regenerative response in the left (intact) kidney following ischaemic injury to the right kidney. This suggests that the growth factors which control the regenerative response in the renal tubules act in an endocrine fashion.

EFFECT OF TACROLIMUS ON REGENERATION OF RENAL TUBULES AFTER ISCHAEMIC INJURY
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Introduction: An ischaemic injury to the donor kidney, an inherent component of renal transplantation, results in acute tubular necrosis and delayed graft function. The recovery of renal function is dependent on the latent capacity of the renal tubules to undergo regeneration. Several of the immunosuppressive drugs used in transplantation are known to be nephrotoxic. In this study we investigated the effect of tacrolimus on the regeneration of renal tubules after an ischaemic injury.

Methods: Adult Long-Evans rats weighing 250 - 300 g were used in this study. The rats were anaesthetised with isoflurane and subjected to a midline laparotomy. The right kidney was dissected and the renal pedicle clamped for 90 minutes, and then unclamped. Postoperatively the animals received either tacrolimus 0.2 mg/kg/day orally or saline orally. Groups of animals were killed at 0, 24, 48, 72 and 96 hours, after which the kidneys removed and subjected to histological (MI) and immunohistochemical (Ki 67 labelling index) assessment.

Results: There was a significant increase in both the MI and Ki 67 labelling index in the control animals, with a peak at 48 hours. There was a similar pattern of increase in both the MI and Ki labelling in the tacrolimus-treated animals, but the levels were lower.

Conclusion: A decreased regenerative response in the renal tubules was noted in rats treated with tacrolimus after an ischaemic injury.
AN AUDIT OF THE PROCESS SURROUNDING ETHICAL APPROVAL OF MMed DEGREES AT UKZN

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Introduction: Research is now a mandatory component of specialist training. This audit reviewed the process surrounding ethical approval of MMed degrees at UKZN.

Methodology: After obtaining the appropriate ethical approval, all the correspondence surrounding each MMed proposal for the year 2010 was retrospectively reviewed by the investigator. The following information was extracted: the ethics number, the department from which the study originated, the date at which ethics received the proposal, the date of the ethics committee's first response, and the dates of all subsequent responses until full ethical approval was given. The nature of the response from ethics was recorded. This could be provisional approval, full approval or declined. Whether the study underwent expedited approval or had to undergo the full ethics process was also noted.

A number of taxonomies were used to classify the nature of the research proposals and the nature of the queries raised by the ethics committee.

Results: A total of 53 proposals for MMed degrees for the year 2010 were available for review. All the proposals except one were level 1 studies. The types of studies were as follows: retrospective chart audit (29), prospective audit (14), questionnaire (9), cross-sectional study (1), randomised interventional study (nil), cadaver-based anatomical study (1).

It took an average of 14.8 weeks for the ethics committee to respond to each of the 53 proposals (range 3 - 32 weeks). Of these 21 (39%) received provisional approval on the first response. In 30 (56%) major revisions were required, and 2 were rejected. There were 8 proposals where the researchers responded to the BREC queries. The average length of time for this response was 4.3 weeks. There were a total of 136 queries raised by BREC: validity (10), fairness (3), risk benefit (4), appropriate investigators (6), consent (13), study design (31), methodology (29), stylistic issues (7), references (3), funding (2), authorship issues (7), remuneration (2), statistics (14), human tissue (1), ethical queries (49), scientific queries (74) and grammatical and stylistic queries (13).

Conclusion: Most of the research methodologies for MMed are low-risk-type methodologies. Obtaining ethical approval for an MMed study is a lengthy process. Slightly over one-third of the proposals are approved at the initial sitting. Concerns about the scientific validity of studies are the most frequent cause for a query.

HOW SIGNIFICANT IS REMUNERATION AS A MOTIVATING FACTOR TO TRAIN AS A NURSE?

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Introduction: Either intrinsic or extrinsic factors influence decision to choose the nursing career. Nursing students are paid a monthly stipend during their training.

Aims and objectives: To determine whether remuneration influences enrolment of nurses into the four-year diploma nursing course and whether clinical exposure at first-year level alters motivation.

Methodology: A questionnaire with 24 questions was compiled using the Rickets scale. Questions were classified into two groups, i.e. monetary or professional factors. Affirmative responses to monetary-related questions would be likely to suggest motivation by remuneration, whereas affirmative responses to professional-related questions would suggest not being motivated by remuneration. Seventy questionnaires were distributed.

Results: The return rate was 97%. The majority of respondents were females and over the age of 20 years. Most (86.7%) agreed that nursing is a calling, but only 47% regarded it as first choice. Only 16% came to nursing because they had nothing else to do. Most (93%) felt that payment of a stipend was important, but 71% would have joined nursing regardless, and 84% were motivated to continue with training after clinical exposure.

Conclusion: The majority (76%) of student nurses seem to be motivated by professional factors. The level of motivation is influenced by gender and age at enrolment. Most of the students would not want the stipend that is paid during training to be stopped. First-year nursing students are motivated by clinical exposure.

ATTITUDES OF UCT SURGICAL SOCIETY STUDENT MEMBERS TOWARDS A CAREER IN SURGERY

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Background: Factors that motivate medical students to pursue a career in surgery and deter them from doing so are well documented. These factors seem to vary between males and females, as well as between junior and senior students. A review of the literature has exposed lack of analysis of these factors in the context of the developing world. Another limitation to most previous studies is the closed-ended nature of their questionnaires.

Aim: To determine the attitudes of the members of the UCT Surgical Society towards a career in surgery.

Participants and methods: This cross-sectional questionnaire-based study assessed the attitudes of 1st- to 6th-year medical students belonging to the UCT Surgical Society in the year 2010. A self-administered questionnaire was presented to opportunistic samples of the study population at society events and whole-class lectures and via an online survey.

Results: Three hundred and four students were sampled out of a population of 723 members (42%); 136 (45%) were males and 168
(55%) females, and 158 (52%) were preclinical students (1st - 3rd years) compared with 146 (48%) who were in their clinical (4th - 6th) years.

Of the respondents, 90% (n=273) considered surgery as a career. There was no difference between males and females with regard to considering a career in surgery (p=0.7). Of the cohort that actually considered a career in surgery, males ranked surgery significantly higher as their future specialty compared with females (2.0 v. 2.7, p=0.00002); 83% of all respondents felt that surgery is a male-dominated field. A significantly greater number of preclinical students considered a career in surgery (p=0.002). Of the cohort that considered a career in surgery, preclinical students ranked surgery significantly higher as their future specialty compared with clinical students (2.2 v. 2.6, p=0.01).

Out of 447 responses, the top 3 factors motivating students to pursue a career in surgery were: surgery is interesting/exciting, greater time spent in theatre (watching and assisting), and encounters with passionate and inspirational surgeon role models. Out of 413 responses, the top 3 deterrents to pursuing a career in surgery were: long/awkward working hours, length of study, and poor lifestyle.

Conclusions: Factors that motivate students to pursue a surgical career and deter them from doing so are many and varied, with some unique to a developing world setting. Perceived deterrents can be addressed in order to increase student interest in a surgical career.

THE IMPACT OF A STUDENT SURGICAL SOCIETY ON ITS MEMBERS’ ATTITUDES TOWARDS A CAREER IN SURGERY

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Background: Factors that influence medical students’ desire to pursue a career in surgery are well documented and have been studied since the 1980s. However, there are few data available that describe the role of a student surgical society in motivating medical students to pursue a career in surgery. How many of the members of the UCT Surgical Society actually intend to pursue a surgical career, and to what degree has the society and its various activities influenced this choice?

Aim: To determine the impact of the UCT Surgical Society and its activities on its members’ attitudes towards a career in surgery.

Participants and methods: This cross-sectional questionnaire-based study assessed the attitudes of 1st- to 6th-year medical students belonging to the UCT Surgical Society in the year 2010. A self-administered questionnaire was presented to opportunistic samples of the study population at society events and whole-class lectures and via an online survey.

Results: Three hundred and four students were sampled out of a population of 723 members (42%); 136 (45%) were males and 168 (55%) females, and 158 (52%) were preclinical students (1st - 3rd years) compared with 146 (48%) who were in their clinical (4th - 6th) years.

Of the respondents, 90% (n=273) considered surgery as a career. The following factors were significantly associated with an increased interest in pursuing a surgical career: being a preclinical student (p=0.002), attending >3 talks per year (p=0.04), and attending a surgical skills workshop (p=0.04). The following factors were not significantly associated with an increased interest in pursuing a surgical career: gender (p=0.7), and membership for >1 year (p=0.9).

Of those who considered a career in surgery, 54% did so before starting medical school, 73% before joining the society, and 21% (n=58) only after joining the society. A further 60% indicated that the society strengthened their determination to pursue surgery, and 57% that it generated an increased interest in a specific surgical specialty.

Seventy-three per cent of those who attended society talks, and 55% of those who attended skills courses, identified that these activities motivated them to pursue a surgical career.

Conclusions: Through its activities, the UCT Surgical Society inspires some of its members who have not previously done so to pursue a career in surgery. For those who have previously considered surgery as a career, the society strengthens their determination to pursue a career in surgery and increases their interest in specific surgical specialties.

THE UCT SURGICAL SOCIETY: A REVIEW OF AFRICA’S FIRST STUDENT-LED SURGICAL SOCIETY

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Background: The UCT Surgical Society was established in 2006 by seven UCT medical students and by 2010 had grown to over 700 members. The society’s current activities include academic talks, surgical skills workshops and anatomy workshops. A number of potential activities have been identified that could further aid the society in meeting its objectives. The attitudes of members towards current and potential society activities have not been assessed.

Aim: To assess the attitudes of student members towards the current and potential activities of the UCT Surgical Society.

Participants and methods: This cross-sectional questionnaire based study assessed the involvement and perceptions of 1st- to 6th-year medical students, belonging to the UCT Surgical Society in the year 2010. A self-administered questionnaire was presented to opportunistic samples of the study population at society events and whole-class lectures and via an online survey.

Results: Three hundred and four students were sampled out of a population of 723 members (42%); 136 (45%) were male and 168 (55%) female, and 158 (52%) were preclinical students (1st - 3rd years) compared with 146 (48%) who were in their clinical (4th - 6th) years. The average duration of membership was 2.3 years (SD 1.1, range 1 - 6) and the average number of talks attended was 5.2 (SD 2.7, range 0 - 10); 33% of respondents had attended a surgical skills course.

Of the students 51% indicated that the society had increased their interest in a surgical specialty, the top three specialties being neurosurgery, trauma surgery and cardiothoracic surgery, 57% felt
that the society's current activities fill the gap in surgical education during the preclinical years, and 65% of the 5th- and 6th-year students who had rotated through surgery stated that the society's current activities positively supplemented their clinical rotations. Eighty-six per cent of the students felt that they would benefit from an opportunity to 'shadow' surgeons, 60% that they would benefit from participating in surgical research, 90% that they would benefit from increased hands-on time in the operating theatre, and 61% that they would benefit from informal opportunities to interact with surgeons and surgical registrars. Sixty-nine per cent of students felt that efforts by the society to expose its members to a greater number of female role models could change the fact that surgery is a male-dominated field.

Conclusions: The members of the UCT Surgical Society perceive its current activities as supplementing the preclinical and clinical curricula. Members are positive about proposed future activities that could further supplement surgical exposure at the undergraduate level.

LAPAROSCOPIC PERICARDIAL WINDOW FOR DEFINITIVELY EXCLUDING PENETRATING CARDIAC INJURY – OUR INTERESTING AND POSSIBLY PIONEERING CASE IN SOUTH AFRICA

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Background: Penetrating wounds in the ‘cardiac zone’ present a dilemma in diagnosis. Ruling out a penetrating pericardial injury is paramount, but all the non-invasive techniques lack 100% sensitivity. If suspicion is high, the only foolproof way to rule out the injury is by doing a pericardial window. The two classic approaches are the extraperitoneal subxiphoid window and the intraperitoneal, trans-diaphragmatic window. Both approaches require a significant incision (6 - 8 cm) to achieve a ‘tangential’ view superiorly toward the pericardial space.

Case report: We present a case of a stable patient with multiple stab wounds, including a left precordial wound and a RUQ abdominal wound. The patient had clinical signs of an acute abdomen.

In casualty, the patient was diagnosed with a haemothorax and an acute abdomen. An intercostal drain was inserted and the patient taken to theatre for a diagnostic laparoscopy and laparoscopic, trans-abdominal pericardial window.

Using a single body cavity (abdomen) and three ports, we were able to explore the abdomen, remove the damaged gallbladder, wash out the bile and exclude a diaphragmatic injury. In addition, a trans-diaphragmatic pericardial window was performed using the same ports and cavity, thereby definitively excluding a cardiac injury in the same procedure, and without further incisions. The actual window itself was small owing to the magnification offered by the laparoscope, and the diaphragm was closed simply with 2 intracorporeal sutures.

A literature review yields only 3 papers describing experience with laparoscopic pericardial windows (in trauma). To our knowledge, there are no South African studies and few other centres, if any, are practising it.

Conclusion: Laparoscopy in trauma is a slowly but steadily evolving technique. There has been much speculation owing to the fear of missing injuries or losing control of bleeding, but as laparoscopic technology and expertise increase, these fears are lessening.

We have presented our first case of a laparoscopic pericardial window (as part of a diagnostic and reparative laparoscopy for trauma). The procedure proved to be safe, quick and easy to perform, with all the advantages that laparoscopy has to offer over open surgery. It also has the advantage of diagnosing and managing any associated abdominal or diaphragmatic injuries.

OUTCOME OF LAPAROSCOPIC INGUINAL HERNIA REPAIR IN A SOUTH AFRICAN PRIVATE PRACTICE

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Introduction: The aim of this study was to determine recurrence and complication rates after laparoscopic inguinal hernia repair performed in a private practice in Cape Town.

Methods: An unselected cohort of 267 patients who underwent laparoscopic totally extraperitoneal (TEP) inguinal hernia repair prior to September 2005 were included in this study, thus ensuring a minimum 5-year follow-up. Patient demographic data, clinical notes, operation notes and outpatient follow-up notes were studied. Patients were interviewed telephonically and asked about hernia recurrence, chronic pain and technique preference if they had previously undergone an open repair. All data collected were recorded on an electronic spreadsheet. The primary outcome parameter was the incidence of recurrence. The secondary outcome parameters were the incidence of postoperative and long-term complications.

Results: There were 384 hernia repairs in the 267 patients, with a mean follow-up of 8.8 years. There were 9 recurrences (2.3%). The overall complication rate was 7.9%. Two per cent of patients suffered from chronic groin pain more than 5 years after surgery. Sixteen per cent of patients had had a previous open repair of an inguinal hernia, either on the ipsilateral or the contralateral side, and all judged the open repair to have been more painful.

Conclusions: The recurrence and complication rates for laparoscopic TEP inguinal hernia repair in this practice are low and comparable to the best series. The laparoscopic technique is associated with less postoperative pain and is the preferred method of repair for patients who have experienced both methods.

THORACOSCOPIC SYMPATHECTOMY FOR PRIMARY HYPERHIIDROSIS: A RETROSPECTIVE STUDY OF PATIENT OUTCOMES

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Introduction: Thoracoscopic sympathectomy (TS) has emerged as the best treatment option for primary hyperhidrosis (PH). The aim of this study was to evaluate the efficacy of TS and also to enumerate the complications associated with the procedure.
Methods: We retrospectively reviewed consecutive patients who had TS for PH from January 2000 to January 2010. Sixty-eight patients were analysed, with a mean age of 23.8 years. Disease location was palmar in 47% of cases, axillary in 15% and in both locations in 32%. Sympathectomy was achieved by thermal or ultrasonic ablation of the 2nd and 3rd ganglia for palmar disease and included the 4th ganglion for axillary disease. The medical records were retrospectively reviewed and individual telephonic interviews were done with 61 out of 68 patients. Statistical analysis was performed by paired t-tests and Pearson correlation coefficients using statistical analysis software (SAS Inc., NC, USA), with p-values <0.05 considered statistically significant.

Results: The mean duration of PH prior to intervention was 6.3 years. The duration of follow-up was 4.9 years. There were no conversions to thoracotomy and no deaths. Nine patients sustained pneumothoraces, 3 had self-limiting surgical emphysema, and 1 developed a transient monoparesis of the left lower limb. The mean hospital stay was 1.4 days. Four patients required re-sympathectomy. Compensatory hyperhidrosis was reported in 8 patients, and transient dryness of the feet was observed in 19. There was a significant decrease in postoperative sweating scores. The mean satisfaction score was 8 out of 10.

Conclusion: TS remains a safe and effective treatment option for PH, despite the poorly understood side-effect of compensatory hyperhidrosis.

SELF-EXPANDING METAL STENTS FOR PALLIATION OF OESOPHAGEAL CANCER – A 4-YEAR REVIEW
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Introduction: Endoscopic placement of self-expanding metal stents (SEMS) is widely used for palliation of dysphagia in patients with inoperable malignant oesophageal lesions. This study was undertaken to document the periprocedural experience with a pure endoscopic technique of placement.

Patients and methods: A retrospective analysis of all patients stented for oesophageal cancer at the Gastrointestinal Unit at Grey’s Hospital, Pietermaritzburg over a 4-year period (2007 - 2010) was done. Data were analysed from completed procedure forms and included demographics, tumour length, the presence of fistulas, stent size and complications. Stenting was performed without radiological guidance. At endoscopy the oesophageal lesion was dilated over a guidewire, and the stent was passed over the wire and positioned and deployed under direct endoscopic vision.

Results: A total of 394 stents were inserted over a 4-year period, 27 for benign and 367 for malignant disease. In the malignant group there were 347 patients, 30 of whom required repeat stenting. Of the 347 patients, 142 (40.9%) were female and 205 (59.1%) male. The mean age was 60 years (range 38 - 101). There were 328 black patients (94.5%), 15 white patients (4.2%) and 4 Indian patients (1.3%).

The reasons for palliative stenting were distributed as follows: age >70 – 67 patients; tumour length >8 cm – 102; presence of tracheo-oesophageal fistula – 23; unspecified – 142. There was also a patient who had metastases, another who refused surgery, and one stent for post-oesophagectomy leak.

Among those requiring repeat stenting, 8 had stent migration, 10 had proximal tumour overgrowth, 10 had distal tumour overgrowth, and 1 each had a blocked stent and a stricture. Only 3 complications were recorded (0.9%) – 2 iatrogenic tracheo-oesophageal fistulas and 1 false tract created through a long lesion. All 3 were nevertheless successfully stented.

Conclusion: The number of patients with inoperable oesophageal cancer seen at Grey’s Hospital is considerable. The average annual load of palliative stents is 90 patients. Stenting forms the core of palliative care for patients with dysphagia, with or without fistulas. Recurrent dysphagia can be effectively managed by restenting. Pure endoscopic SEMS placement is a viable and safe option with a low periprocedural complication rate.

PERI-OPERATIVE CHEMOTHERAPY FOR LOCALLY ADVANCED GASTRIC CANCER IN A SINGLE SURGICAL UNIT AT GROOTE SCHUUR: A PRELIMINARY REVIEW
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Introduction: Gastric cancer is a common problem globally and in South Africa, with a particular concentration in the Western Cape. Recent studies have shown improved survival in gastric cancer with the use of adjuvant chemotherapy with or without radiotherapy. Over the past 2 years, this unit has started a peri-operative chemotherapy protocol for selected patients with histologically proven gastric cancer in general accordance with the MAGIC trial guidelines from the UK. The aim of this study was to review our experience to date with this new protocol.

Methods: In our unit, all patients with gastric cancer are assessed pre-operatively with endoscopy, contrast meal or swallow and contrasted CT scan of the abdomen. Patients found to have locally advanced disease with no metastatic spread and no absolute features of irresectability are selected for peri-operative chemotherapy. The patient’s fitness for surgery and chemotherapy is then assessed with the standard clinical investigations. Diagnostic laparoscopy is then performed on this selected group to rule out peritoneal or other metastases. Patients who are macroscopically clear of disease are referred for chemotherapy. Three cycles of pre-operative chemotherapy consisting of ECF are administered. Surgery is then performed within the next 6 weeks. A further three cycles of chemotherapy are given postoperatively.

A retrospective review of all patients selected for peri-operative chemotherapy was done. Information collected included patient demographics, site of tumour, histological subtype, clinical presentation, chemotherapy received and toxicity, intra-operative findings, final histology and number completing postoperative chemotherapy.

Results: Approximately 180 - 200 new patients with gastric cancer were referred to the endocrine oncology surgical unit.
during this time period, the majority of whom had advanced or metastatic disease at presentation. Twenty-one patients in total were considered for peri-operative chemotherapy. Eighteen patients underwent diagnostic laparoscopy, with 1 complication. Seven patients were not considered fit for chemotherapy. Three patients received radiotherapy for the purpose of downstaging the tumour pre-operatively. The remaining 11 patients were deemed suitable for peri-operative chemotherapy. Only 8 completed all three cycles of pre-operative chemotherapy. There was 1 death, and significant toxicity in at least 3 patients, who could not complete all three cycles of chemotherapy. One patient had an irresectable tumour found at laparotomy, and 2 had complications following surgery. Two of 8 patients completed the postoperative chemotherapy course. No significant macroscopic downstaging of the tumour was noted.

Conclusion: Peri-operative chemotherapy in gastric cancer is considered standard of care in many parts of the world. Our initial experience remains limited, but this review demonstrates the morbidity associated with chemotherapy and the difficulties associated with this long course of treatment. Significant clinical benefit has not been clearly demonstrated, although the group remains small and data continue to be collected.

COLORECTAL STENTING FOR BENIGN AND MALIGNANT COLONIC STRICTURES: EXPERIENCE FROM THE KWAZULU-NATAL TEACHING HOSPITALS
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Introduction: Colorectal stents relieve large-bowel obstruction while avoiding a colostomy. The aim of this study was to document experience with colorectal stents in the setting of a developing country.

Methods: All patients with large-bowel obstruction without features of strangulation were selected for colorectal stenting. The procedure is performed at Inkosi Albert Luthuli Central and Grey’s hospitals, under conscious sedation. The stent is deployed via a large-channel Olympus colonoscope under fluoroscopic control.

Results: Over a 7-year period (2004 - 2010), 47 colonic stents were inserted in 43 patients. Their mean age was 64.1 years (SD 14.4, range 18 - 86), and the male/female ratio was 1:1. Tumours were in the rectum (29), sigmoid colon (11), descending colon (2) and splenic flexure (1). The indications for stenting were primary colorectal malignancy (28), benign stenosis (3) and tumour recurrence (2).

There was overall success rate of 89%, with a good satisfaction regarding quality of life. There were 5 failures, and colonic perforation occurred in 1 patient. Mean follow-up after stent insertion was 5.8 (SD 8.5) months (range 1 day - 36 months). Twenty-one patients (48%) have died and 6 have been lost to follow-up.

Conclusion: We have used colorectal stenting successfully for malignant and benign strictures, with an acceptable quality of life.

Stenting as a bridge to surgery is uncommon in our practice. Acute angulation of the tumour and failure of the stent to deploy have remained a challenge.

DIAGNOSTIC YIELD OF COLONOSCOPY IN A RURAL REGIONAL HOSPITAL
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Background: In a rural context, inpatient bowel preparation is usually required before colonoscopy. Because this has an impact on bed utilisation, it is important that proper patient selection results in a reasonable diagnostic yield. In an attempt to improve access and use beds rationally, guidelines regarding indications for colonoscopy were distributed and an open-access booking system instituted in 2008. Colonoscopy utilisation and diagnostic yield were prospectively audited.

Methods: Data regarding referral patterns, indications and outcomes of colonoscopy performed by two surgeons were prospectively recorded over a 12-month period during 2010.

Results: The database included 257 records; 58 (22%) of these had been referred by the open-access booking system without prior evaluation at the regional hospital. Significant findings, defined as cancer (14 cases); adenomatous polyps over 1 cm or with at least moderate dysplasia (5) or a significant inflammatory process (15), were found in 13.2% of cases. In the remainder, findings were either normal or insignificant. Eight of 14 cancers were within the reach of the rigid sigmoidoscope. The principal complaint was constipation in 55 patients, none of whom had a significant finding. Patients referred by the open-access system were more likely to have significant findings.

Discussion: Diagnostic yield of colonoscopy is poor and may be improved by adherence to guidelines. Constipation was a particularly low-yield symptom. Rigid sigmoidoscopy should be more widely available.

CANCER-FREE SURVIVAL IN MUTATION-POSITIVE HNPCC INDIVIDUALS WITH COLORECTAL ADENOMATOUS POLyps INDENTIFIED ON SURVEILLANCE COLONOSCOPY
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Hereditary non-polyposis colorectal cancer (HNPCC) is the most common inherited colorectal cancer, and accounts for 3 - 5% of all colorectal cancers. HNPCC has been shown to have an accelerated adenoma-carcinoma sequence of 2 - 3 years. The decision around surgery versus ongoing surveillance for HNPCC-associated adenomatous polyps remains unclear. The limited access of this population to healthcare in a developing country further complicates management.

Aim: To determine the cancer-free survival of patients with biopsy-proven benign adenomatous polyps receiving colonic resection and those on continued surveillance colonoscopy.
Background: As in most burns units across the globe, P. aeruginosa burn wound infection is a major cause of morbidity and mortality in the burns unit at Red Cross War Memorial Children's Hospital. The bactericidal action of sodium hypochlorite has been known since the 1880s, and it has been used in clinical practice for more than 70 years. In their landmark study in 1991, Heggers et al. investigated a buffered sodium hypochlorite solution for the management of burn wound infection. The buffered 0.025% sodium hypochlorite solution was found to be the optimal concentration. A buffered sodium hypochlorite is currently not available for use at the Red Cross Children's Hospital burn unit, so an unbuffered solution is being used in the topical management of patients with P. aeruginosa burn wound infection.

Aim: The aim of this study was to investigate the optimal concentration of an unbuffered sodium hypochlorite solution in the management of P. aeruginosa burn wound infection, as well as determining a shelf-life for this solution.

Methods: Human fibroblasts were exposed to serial dilutions of unbuffered sodium hypochlorite solutions with concentrations of 0.025%, 0.0125%, 0.006% and 0.003% for 30 minutes. The cells were then cultured in growth medium for 24 hours and assessed for viability. Isolates of P. aeruginosa, Staphylococcus aureus and Streptococcus pyogenes were also exposed to the same concentrations of unbuffered sodium hypochlorite and cultured for 24 hours using a modified broth solution. The minimum bactericidal concentration was therefore established. The pH, osmolality and electrolyte concentrations of this unbuffered solution were also tested. These experiments were repeated daily with solution stored at room temperature for 6 consecutive days.

Results: Twenty-four per cent of fibroblasts were viable after exposure to a 0.025% solution, 86.2% after 0.0125%, 88% after 0.006% and 98.9% after 0.003%. These results remained constant for 6 consecutive days, during which the unbuffered sodium hypochlorite was stored at room temperature.

The MBC for all the P. aeruginosa isolates was 0.003%, that for the S. aureus isolates was 0.006% and that for the S. pyogenes isolates was 0.0015%. These results remained constant for 6 consecutive days during which the unbuffered sodium hypochlorite was stored at room temperature.

The unbuffered 0.0025% sodium hypochlorite solution has a pH of 10 and an osmolality of 168. The sodium concentration is 89 mmol/dl and the concentration of chloride 84 mmol/dl. This remained stable with the 0.025% stored at room temperature over 14 days.

Conclusions: An unbuffered solution of sodium hypochlorite with a concentration of 0.006% seems to be optimal for use in the
management of \( P \) aeruginosa burn wound infection. It has a shelf-life of at least 5 days at room temperature.

**A PROSPECTIVE AUDIT OF BURN WOUNDS ASSOCIATED WITH EPILEPSY AT EDENDELA HOSPITAL**

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**Introduction:** From a previous retrospective audit of burns at our institution, we noted a high incidence of burns associated with epilepsy. This prospective audit reviews our experience with burns associated with epilepsy.

**Methods:** All burns patients at our institution are entered onto a database. Each patient admitted with a burn injury associated with epilepsy was assessed jointly by the author and by a physician specialist to establish the nature of the epilepsy as well as the degree of compliance with treatment. Where indicated, the serum levels of anti-epilepsy drugs were measured.

**Results:** Since January 2011, 10 adult patients have been admitted with a burn wound associated with epilepsy. The average age was 34 years (range 20 - 55 years). Eighty per cent were females. The mean total body surface area (TBSA) of the burns was 3.5% (range 1 - 5%). One-third were full thickness, one-third dermal and one-third superficial. Distribution was the lower limbs in half the patients, the upper limbs in 3 and the face in 2. Flame was the cause in 90%. The activity at the time of the burn was most often cooking, and in all cases the patient experienced a seizure at the time of the burn injury.

**Conclusion:** This is a pilot study that needs to be continued. Information is difficult to obtain from epileptic patients. It appears that epileptic women are most at risk for burn injury. They sustain small but deep burn injuries.

**SURVIVAL FUNCTION AND PROTEIN MALNUTRITION IN BURNS PATIENTS AT A RURAL HOSPITAL IN AFRICA**

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**Background:** Burns constitute a thermal injury-related breach in the surface of the skin. Burns are one of the most frequent and devastating forms of trauma worldwide.

The lack of thermal injury epidemiological data from the Eastern Cape, the most disadvantaged South African province for historical reasons, prompted us to perform the present study. Its findings adjusted for confounding factors will help in organising the most efficient measures to prevent mortality among burned patients from the Eastern Cape province.

**Aim:** To estimate the incidence of acute malnutrition and identify predictors of case fatality among burns patients in the poorest South African province, the Eastern Cape.

**Patients and methods:** This was a longitudinal follow-up conducted among consecutive burn patients admitted to Nelson Mandela Academic Hospital, Mthatha, Eastern Cape, between 2006 and 2008. Patients were monitored and treated daily from admission to discharge. Outcomes were acute protein malnutrition and mortality. Patient demographic information, TBSA of the burn, cause of burn, weight, height, location of burn, haemoglobin value, serum albumin, wound infection, and antibiotics after culture and sensitivity results were the potential predictors of in-hospital mortality. A Cox proportional hazards model for the time to death was then used to identify independent predictors of mortality after adjusting for confounding factors. Kaplan-Meier survival curves were generated for each arm of exposure status.

**Results:** Sixty-seven patients (35 males, 59 children) were studied. The mean age was 8 (SD 12) years (range 1 month - 59 years). The cumulative incidence rate of acute malnutrition was 62% (n=42): 46.3% (n=31) at admission and 15.7% (n=11) after 7 days of hospitalisation. The mortality rate was 16.4% (n=11 with in-hospital acute malnutrition). The only significant and independent predictors of mortality were TBSA burn >40% (hazard ratio (HR) 10.5, 95% CI 1.7 - 63; \( p=0.018 \)) and affected anterior trunk (HR 4.4, 95% CI 1.3 - 14.7; \( p=0.018 \)).

**Conclusions:** Strategies to prevent burns and evidence-based practice with very early nutritional supplementation are urgently needed to reduce very high rates of malnutrition and mortality.

**EVALUATION OF ‘FLUID CREEP’ IN A REGIONAL BURNS UNIT**

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**Introduction:** With the use of the Parkland formula for fluid resuscitation after burn injuries, patients tend to receive more fluid than necessary. This phenomenon is called ‘fluid creep’ and can lead to soft-tissue oedema, limb and abdominal compartment syndromes and pulmonary oedema. This audit attempted to investigate the extent of the problem in our unit.

**Methods:** Fluid charts of patients admitted to the burns unit from July 2010 to April 2011 were retrospectively reviewed. Exclusion criteria were burn size TBSA less than 10%, delayed presentation of more than 24 hours or fluid resuscitation started at district hospital.

**Results:** Seventeen charts were available for review. There were 8 children (median age 3 years, range 1 - 11 years) and 9 adults (median age 34 years, range 14 - 61 years). The average weight was 42 kg (range 9.6 - 80 kg). The average TBSA was 22% (range 10 - 49%). The average fluid planned for the first 24 hours was 4.6 ml/kg/% and the average fluid actually received for the first 24 hours was 3.2 ml/kg/%. The average urine output for the first 24 hours was 1.4 ml/kg/h. Four patients (23.5%) received more fluid than prescribed, with an average of 6.2 ml/kg/%. In this group, the average urine output was 2 ml/kg/h (range 1.19 - 2.4 ml/kg/h).

They were all children, with average age of 4.5 years (range 2 - 10 years). No complications of over-resuscitation occurred.
The remainder of the patients, who received less fluid than that prescribed, had an average of 2.9 ml/kg/% with an average urine output of 1.24 ml/kg/h. Their average age was 28.1 years (range 1 - 61 years).

Conclusion: Contrary to what is reported in the literature, burn patients at Edendale Hospital seem to get less fluid than prescribed, with an average of 3.2 ml/kg/%

A PROSPECTIVE RANDOMISED SINGLE-CENTRE STUDY COMPARING TREATMENT OF PARTIAL-THICKNESS BURNS BY SKIN SUBSTITUTE WITH CONVENTIONAL THERAPY (INTERIM REPORT)

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Introduction: In the past decade efforts have been made to treat partial-thickness burns differently. Many temporary skin substitutes are being used to reduce sepsis and hospital stay. However, more studies are needed to establish their cost-effectiveness.

Methods: A prospective single-centre randomised controlled study comparing the healing time and number of dressings of partial-thickness burn wounds treated with Versajet, Biobrane and Acticoat (BA) with those in patients receiving conventional therapy (CT) at the Burns Centre at Chris Hani Baragwanath Hospital.

Results: Eighty-four patients were randomised to BA (40) and CT (44). The median TBSA was 15% in the two groups. The median length of stay for the CT group was 21 days compared with 10 days for the BA group, and the median number of dressing changes was 10 in the BA group and 14 in the CT group for wounds of more than 20% TBSA. They were 5 deaths in the CT group and 1 in the BA group. There was no difference in healing time for burns with a TBSA of less than 20%.

Conclusion: In the BA group there was a significantly reduced length of stay in patients with more than 20% TBSA burns, and fewer dressing changes, especially in burns of more than 20% TBSA. However, there was no difference in healing time for wounds of less than 20% TBSA.

ELECTRICAL BURNS AND COPPER PRICE

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Introduction: Electrical burns are associated with major morbidity and high mortality. An increased number of cases is being seen at the Chris Hani Baragwanath (CHB) Burns Unit. The aim of the study was to analyse whether there is any correlation of these burns with copper price.

Method: A retrospective review was conducted of electrical burns cases admitted to the CHB burns unit from 1995 to 2010. The copper price over the past 15 years was also reviewed.

Results: One hundred and thirty-two patients were studied. The mean TBSA was 19.9%. Of the patients 37% had been burned in the course of suspected or documented cable theft, 4% by lightning and 10% in domestic accidents; the remainder were unspecified. The number of cases has increased considerably since 2003, and the price of copper on the international market has also increased over that time, despite a sharp decrease in 2009 due to the global financial crisis.

Conclusion: There is a correlation between the price of copper and the number of electrical burns at our centre. We recommend a full police clampdown on illegal buyers of stolen copper to reduce these injuries and deaths.

LAPAROSCOPIC MANAGEMENT OF PERFORATED PEPTIC ULCER

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Introduction: Despite major advances in the management of peptic ulcer disease, its complications have remained a major challenge. Minimally invasive surgery has become an integral part of the management of the perforated peptic ulcer. We report our initial experience with laparoscopy in managing these patients.

Methods: The records of patients presenting with generalised peritonitis from perforated peptic ulcers between January 2006 and May 2011 were reviewed. We included privately treated patients. The patient demographics, clinical picture, operative procedure and outcomes were looked at. All patients were resuscitated on admission and operated on under general anaesthesia. A three-port technique was used in most cases, with an additional port inserted when necessary. The peritoneal cavity was rinsed with copious amounts of warm saline and the ulcer was closed with a Graham patch or a modification thereof using absorbable sutures. Drains were placed selectively.

Results: During this period 35 patients were seen (27 males and 8 females). Their mean age was 46 years (range 23 - 65 years), the average operative time was 55 minutes, and the mean hospital stay was 3 days. Complications were readmission with a bleeding ulcer after 3 weeks, and postoperative leaks in 2 patients, 1 of whom developed acute renal failure and required dialysis. There was 1 death, from acute myocardial infarction 12 hours postoperatively. All the patients with leaks were operated on laparoscopically.

Conclusion: Laparoscopic surgery for perforated peptic ulcer is feasible and safe. It results in shorter hospital stay and quicker recovery.

ERADICATION OF HELICOBACTER IN WESTERN CAPE TEACHING HOSPITALS

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Aim: Our aim was to study the rate of Helicobacter pylori eradication in the Western Cape. The first line of treatment at
Tygerberg and Karl Bremer hospitals is a combination of a proton pump inhibitor (PPI), amoxicillin and metronidazole.

Methods: An open uncontrolled study was done. Patients surveyed for the study were those undergoing gastroscopy at Tygerberg and Karl Bremer hospitals and tested for H. pylori. Patients excluded were those not willing to participate, those with unconfirmed H. pylori infection, those treated with a PPI, amoxicillin or metronidazole in the 2 weeks prior to the start of the study, and those with confirmed gastric carcinoma.

H. pylori infection was confirmed when the HpOne urease test, done during the gastroscopy, was positive.

Drug treatment for the eradication of H. pylori consists of 10 days of oral amoxicillin (1 g twice daily) and metronidazole (400 mg 3 times a day), plus 1 month of omeprazole (20 mg per day). Patients were instructed to take their medicine regularly and to complete the treatment regimen. All patients who underwent this eradication therapy were examined 6 weeks later, and signs and symptoms of peptic ulcer disease were documented. They were re-scoped, the urease test was repeated, and the remaining tablets were counted to confirm compliance. The rate of eradication was then calculated.

Results: H. pylori was successfully eradicated in only 67 of the 96 patients who qualified to participate in the study, giving a 69.8% success rate. The 95% CI was calculated and ranged from 60.6% to 79%.

Discussion: The results of this study show that not even the upper range of the 95% CI is above 80%, and that our treatment at Tygerberg Hospital is therefore unacceptable and we are not achieving international accepted guidelines for treatment. According to the Maastricht III consensus paper, the combination of clarithromycin with amoxicillin or metronidazole is the recommended first-line treatment. The most logical recommendation would be to change the Tygerberg protocol to a PPI, amoxicillin and clarithromycin.

PLATELETS AND SEPSIS
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Introduction: Platelets promote sepsis-induced pulmonary recruitment of neutrophils. However, the identity of the platelet-derived molecule regulating neutrophil infiltration is not known. The hypothesis of the present study was that platelet-derived CD40L might be responsible for platelet-mediated activation and accumulation of neutrophils in sepsis.

Aim: To examine the role of platelets and CD40L in abdominal sepsis.

Methods: Wild-type C57BL/6 mice and CD40L gene-deficient mice were exposed to caecal ligation and puncture (CLP). Lung oedema, broncho-alveolar neutrophils, CD40L and macrophage inflammatory protein-2 (MIP-2) plasma levels, myeloperoxidase activity and Mac-1 expression were determined up to 24 hours after CLP induction. For platelet depletion an anti-GP1balpha antibody was administered before CLP.

Results: Plasma levels of soluble CD40L increased and surface expression of CD40L on platelets decreased in CLP mice. Platelet depletion reduced CLP-induced CD40L levels by 90%. CLP-provoked Mac-1 expression on neutrophils was abolished in CD40L-deficient mice. Interestingly, CLP-induced oedema and myeloperoxidase activity in the lung as well as neutrophil infiltration in the broncho-alveolar space were markedly reduced in mice lacking CD40L. In vitro experiments showed that CD40L was not capable of directly increasing Mac-1 levels on neutrophils. Instead, CLP-induced plasma levels of MIP-2 were significantly reduced in CD40L-deficient mice, and inhibition of the MIP-2 receptor (CXCR2) decreased Mac-1 expression on neutrophils in septic animals.

Conclusions: CD40L derived from platelets is a potent activator of neutrophils and mediates sepsis-induced neutrophil recruitment and lung oedema. The neutrophil-activating mechanism of CD40L is indirect and mediated via MIP-2 formation and CXCR2 signalling. Targeting CD40L may be an effective approach to limit pulmonary damage in abdominal sepsis.

AN AUDIT OF THE QUALITY OF INITIAL TRAUMA RESUSCITATION IN A REGIONAL HOSPITAL
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Introduction: The initial appropriate resuscitation of trauma patients will impact positively on their subsequent clinical course. This pilot study reviewed the quality of initial trauma resuscitation at a regional hospital in South Africa.

Methods: This was a prospective descriptive study. Inclusion criteria were all trauma patients admitted to the ICU who received their initial resuscitation in our institution. The admission notes were reviewed independently by two consultant intensivists. Neither had been involved in the initial patient management.

Results: A total of 20 cases were audited. Three of these (15%) had no documentation at all by admitting staff. In the remaining patients, the mechanism of trauma was penetrating (47%) and blunt (53%). Only 64% of doctors wrote their name, and only 44% the date and time when the patient was seen. Seventeen per cent of cervical spines were assessed with appropriate placement of a collar, the airway was assessed in 47% of cases, breathing in 43%, circulation in 50%, the GCS was assessed in 53% and the pupils in 29%. Temperature was not assessed in a single patient. In 23% intravenous lines were inserted, with 29% receiving fluids. Only 35% had a urinary catheter and 35% received analgesia. Only 21% of patients were seen again for review before theatre or ICU admission. Seventy-one per cent had an emergency operation, with an average time to theatre of 11 hours and duration of operation just under 4 hours.

Conclusion: Although poor record keeping makes it difficult to accurately assess the quality of our resuscitation, it does appear that acceptable protocols are generally not followed in our institution.
HIGH-INTENSITY FOCUSED ULTRASOUND IN THE CONTROL OF BLEEDING FROM SOLID ORGAN INJURIES

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Introduction: Sound waves have been used as a diagnostic modality for a long time, and they are now also used in treatment. By focusing the sound beam and increasing the intensity of the energy, a tissue coagulum can be created with millimetre accuracy without causing damage to the surrounding or intervening tissue. This modality has been in use by the Chinese to treat hepatic metastases of gastro-intestinal malignancies by creating thermal coagulation of the lesion percutaneously.

HiFU with a transducer with a shorter focal distance was effective to control bleeding from the injury. Further work is needed to get the fixed focus concentrated to the injury. We were able to control the bleeding with another transducer with a 5 cm focus to get the fixed focus concentrated to the injury. We attempted to control the bleeding from the injury with percutaneous application.

Patients and methods: The HiFU system consists of a power generator and a hand-held transducer or probe, with a fixed focal distance. The depth of focus can only be changed by the interposition of a bag filled with water. A diagnostic probe (Sonosite Diagnostics, USA) is fixed to the side of the therapeutic transducer to see where the injury is, and also where the energy beam is focused. We had access to two transducers, one with a focal distance of 10 cm and a second one with a focal distance of 5 cm.

Four pigs weighing 25 - 35 kg were used. Under general anaesthesia a laparotomy was done, and a controlled injury (a 3 cm long, 1 cm deep cut with a scalpel) was created in the right lobe of the liver. We attempted to control the bleeding from the injury percutaneously with HiFU, but the pigs were too small to get the fixed focus concentrated to the injury. We were able to control the bleeding with another transducer with a 5 cm focus applied locally on the injury.

Results: Percutaneous application of HiFU to control bleeding was not effective in our current model. However, local application of HiFU with a transducer with a shorter focal distance was effective in controlling the bleeding from the liver injury.

Conclusion: HiFU was effective to control the bleeding from the liver, when applied direct to the injury. Further work is needed to develop a transducer with a variable focus.

THERAPEUTIC LAPAROSCOPY IN TRAUMA: THE NEW PARADIGM

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Introduction: Laparoscopy in trauma is controversial at best and regarded as dangerous in some circles. Earlier data published in the early nineties reported a high rate of missed small-bowel injuries in particular. These early data set off a firestorm in this arena, and many trauma surgeons have been very reluctant to embrace this modality in trauma care.

Aim: We document our results using laparoscopy in treating trauma patients in our unit.

Methods: We prospectively collected the records of all patients treated at our institution using minimally invasive surgery. The patients’ demographic data, operative findings, procedure and outcomes were looked at during January 2009 and May 2011. We excluded patients who had a soft abdomen with a lower chest stab wound and suspected diaphragm injury, as these receive routine diagnostic laparoscopy in our unit.

Results: During the study period 66 patients were treated using this modality (46 males, 20 females). These were all...
haemodynamically stable with a tender abdomen or suspected intra-abdominal injury. Injuries were as follows: disembowelment 6, gunshot abdomen 10, stab abdomen 29, blunt abdominal trauma 13, suspected diaphragm injury with tender abdomen 8. Procedures done were repair of the colon 6, small-bowel repair 24, combined small-bowel and colon repair 4, stomach and diaphragm repair 9, splenectomy 2, bladder repair 4, cholecystectomy and hepatorraphy 3, non-remedial laparoscopy 8, conversion to open 5, diaphragm and transverse colon repair 1. Mean operating time was 2 hours and average hospital stay 4 days.

Complications were missed injury 2 (1 resulted in fistulas, multiple organ failure and death), wound sepsis 2, pneumonia 1, prolonged ileus 1, renal failure, intra-abdominal abscess 2, re-operation 2.

Conclusion: There is cautious optimism that minimally invasive surgery in trauma may have a role. The caveat is that it should be done in a closely supervised environment by trained individuals.

CURRENT TRAUMA PATTERNS IN PIETERMARITZBURG
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Introduction: Trauma remains a major health care burden in South Africa. This study examined the pattern of trauma in Pietermaritzburg over the period January - December 2010, seeking to identify trends in injury pattern and overall trauma load.

Methods: The study consisted of a retrospective audit of all the trauma patients admitted by the Pietermaritzburg Metropolitan Complex over the period January - December 2010. The data were taken from the weekly metropolitan morbidity and mortality meeting statistics, as well as data from both ICUs. Included in the data were statistics from the Pietermaritzburg State Mortuary of all trauma-related deaths for the same period.

Results: During 2010, 3 846 trauma patients were admitted to the complex. Of these, 1 378 (35.8%) had been assaulted, 1 160 (30.2%) had been involved in a motor vehicle accident (MVA), and 223 (5.8%) had sustained a gunshot wound and 1 084 (28.2%) a stab wound; 2 539 cases (66%) were therefore related to blunt trauma and 1 307 (36%) to penetrating trauma. A total of 299 trauma patients (7.8%) required ICU admission, 1 307 (36%) due to blunt trauma and 129 (43%) due to penetrating trauma. A total of 546 trauma patients died during this period, 245 (6.45%) after arriving at hospital alive. A total of 301 trauma victims were taken directly to the mortuary. Penetrating trauma had caused death in over half of the group admitted directly to the mortuary.

Conclusion: Blunt trauma remains the major cause of trauma-related admission and death, increasing from 54% in 2009 to 66% in 2010. Gunshot-related admissions continue to decline, from 9% in 2009 to 5.8% in 2010, as have stabbings, from 34% to 28.2%. It would appear that there is a decrease in interpersonal penetrating trauma. However, penetrating trauma remains more lethal than blunt trauma.

BLUNT THORACIC AORTIC INJURY: A POSSIBLE ROLE FOR CONSERVATIVE MANAGEMENT?
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Introduction: Blunt thoracic aortic injury (BTAl) is associated with significant mortality. Treatment modalities include endovascular and open repair, both with associated morbidity (3 - 25%). The aim was to review the conservative management of BTAl in patients at a level 1 trauma unit, determining morbidity, mortality and conversion to another treatment modality.

Methods: A retrospective review of prospectively collected data from 1 August 2007 to 31 December 2010. Data were obtained from the Trauma Bank at Netcare Milpark Hospital. Patients were resuscitated according to ATLS principles. A multislice (64) CT angiogram was part of the primary pan CT scan. CT angigrams were used for diagnosis and follow-up. The aim was a systolic blood pressure of <120 mmHg. All patients were anticoagulated when it was considered clinically safe. Data obtained included age, gender, associated injuries, ISS, NISS, days in the ICU, morbidity and mortality.

Results: Seven patients were managed conservatively. Six were male and 1 female, and the average age was 46 years. All injuries were confirmed on CT scan. The average ISS was 30. In none of the patients did we convert to endovascular or open repair. Follow-up CT scans were done in 6 of the 7 cases, and showed resolution of the BTAl. One patient died shortly after admission from a severe head injury. The mortality rate was 28.5% (2/7), but both deaths were due to the significant head injury. No deaths were caused by the aortic injury.

Conclusion: In a select group of BTAl patients, conservative management may be a reasonable treatment option as it is associated with decreased conversion to endovascular or open repair and decreased mortality.

THE SIZE, BRANCHING PATTERN AND ANATOMICAL RELATIONSHIPS OF THE DORSAL PEDAL ARTERY ON THE DORSUM OF THE FOOT: A CADAVER STUDY
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Background: Surgical techniques such as ankle arthroscopy and reconstructive flap surgery have made detailed knowledge of the dorsal pedal artery (DPA) and the deep fibular nerve (DFN) on the foot dorsum essential.

Aims: The aims of this study were to determine the size and branching pattern of the DPA and its relations to the DFN and inferior extensor retinaculum (IER).

Methods: Forty cadaver ankles were dissected to expose the contents of the anterior tarsal tunnel. The size of the DPA and
branches were measured with a Vernier caliper, and the branching pattern and relationship of the DPA to the DFN and IER were noted.

**Results:** The mean size of the DPA was 3.90 (SD 0.2) mm (n=40). No significant difference was seen between the sexes (t-test, \( p>0.05 \)). The branching pattern of the DPA can be described in 3 categories. In 27.5% the DPA had branches above the IER, in 62.5% underneath IER and in 10% below the IER. No significant difference was noted between the sexes (t-test, \( p>0.05 \)). The bifurcation of the DPA was mostly underneath the IER (57.5%), followed by 37.5% below the IER. In 2.5% the distal branching was above the IER, or absent. The bifurcation of DFNs is similar, as the majority (55.0%) was located underneath the IER, while 27.5% was located above the IER and 17.5% of bifurcations were observed below the IER. A distance of 7.79 (SD 2.9) mm was recorded between the bifurcation of the DPA and DFN. No significant difference was observed when comparing the sexes and the age groups (t-test, \( p>0.05 \)). In some cases the arterial branching led to the formation of trunks, while 'loops' were observed in the branching pattern of the DFN.

**Conclusion:** The measurements and patterns noted increase the awareness of the possible variations and should assist surgeons during vascular and reconstructive surgery.

**CYSTIC LESIONS OF THE BILIARY TREE**

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A 46-year-old man presented with a choledochal cyst associated with an abnormal pancreaticobiliary duct junction (APBDJ). Surgical excision of a cyst and hepaticojejunostomy were performed. The cyst was a type I according to Todani's classification. This classification (I - V) describes a heterogeneous group of conditions with separate aetiologies and different malignant potential. We therefore propose a revised classification system of cystic lesions of the biliary tree, i.e. types A - D.

Type A cysts are associated with an APBDJ. An APBDJ leads to biliary cyst formation proximally in the extrahepatic and intrahepatic biliary tract and also predisposes to malignant transformation of the biliary epithelium. Types B and C are possibly congenital duplications, and type D is a ductal plate anomaly with cysts only in the intrahepatic bile ducts (Caroli's disease). We also propose that the conditions grouped under the Todani classification be called 'cystic lesions of the biliary tree' instead of 'choledochal cysts', as some cysts do not involve the choledochus.

**ANALYSIS OF GALLBLADDER HISTOLOGY IN GALLSTONE DISEASE**

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**Background:** Gallstone disease affects 10 - 15% of the Western population, with an annual incidence of 1:200; 1 - 4% of patients become symptomatic every year. Laparoscopic cholecystectomy is the gold standard for treatment. Currently all gallbladder specimens are sent for histology. Incidental gallbladder cancer is found in up to 1% of gallstone disease.

**Aim:** The purpose of this study was to assess the need for routine histological examination of gallbladders in gallstone disease and its impact on further patient management.

**Methods:** Histological reports of patients who underwent cholecystectomy for gallstone disease between 2005 and 2010 in the Department of Surgery at Steve Biko Academic Hospital were reviewed. A search was made for unexpected pathology and incidental gallbladder cancer. Reports were excluded if patients had a clinical diagnosis or suspicion of malignancy.

**Results:** Unexpected pathological gallbladder findings were detected in 22 (3.2%) of 672 cholecystectomy specimens. Gallbladder cancer (GBC) was detected in 1 specimen (0.14%). Other pathology found was cholesterol polyp 1 (0.14%), cystadenoma 1 (0.14%), ectopic pancreas 1 (0.14%), gastric metaplasia 3 (0.44%) and cholesterolosis 15 (2.23%). The patient with gallbladder cancer presented with acute gallstone pancreatitis and had laparoscopic cholecystectomy. Histological examination revealed a poorly differentiated adenocarcinoma pathological tumour, size T2.

**Conclusions:** Routine histopathological examination of the gallbladder in gallstone disease is of value for identifying unsuspected conditions requiring further postoperative management.

**IATROGENIC CHORDA TYMPANI NERVE INJURY – PERCEIVED TASTE DISTURBANCES FOLLOWING DIFFERENT TYPES OF MIDDLE EAR SURGERY: A PILOT STUDY**

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**Background:** Iatrogenic chorda tympani nerve injury is a well-recognised complication of middle ear surgery. Operative procedures that require the annulus of the tympanic membrane to be lifted risk damaging the nerve. Many patients have perceived postoperative taste disturbances, but do not associate these with an ear problem. However, in certain circumstances the nerve can be damaged pre-operatively by disease (i.e. chronic otitis media with/without cholesteatoma), leaving the nerve hypofunctional. These patients may have no perceived taste disturbances following middle ear surgery.

**Aim of study:** The aim of the study was to determine the prevalence of perceived taste disturbances following different types of middle ear surgery, what type of middle ear surgery is associated with a higher prevalence of postoperative taste disturbances, and whether the pre-operative condition of the middle ear plays a role in postoperative taste disturbances.

**Methods:** **Study design:** Cross-sectional comparative pilot study using a questionnaire. **Setting:** Department of Otorhinolaryngology Steve Biko Academic Complex, Pretoria. **Sample size:** 54. **Inclusion criteria:** Adults aged between 18 and 80, who underwent middle ear
surgery in which the annulus was lifted. Patients were categorised into three different groups according to the type of procedure done. These three groups were tympanotomy, tympanoplasty and tympanomastoidectomy. Exclusion criteria: Any revision surgery to the same ear, any evidence of active chronic mucosal disease of the middle ear, any underlying psychiatric condition, and any olafactory dysfunction pre- or postoperatively. Measurements: At the first postoperative visit, 7 days after surgery, the patients filled in a questionnaire. Statistical analysis: Analysis was done by the Medical Research Council of South Africa.

Results: Fifty-four patients received questionnaires. Twenty patients had tympanoplasties, 15 had tympanomastoidectomies and 19 had tympanotomies; 11 of the 20 (55%) in the tympanoplasty group, 3 of the 15 (20%) in the tympanomastoidectomy group and 16 of the 19 (84%) in the tympanotomy group had postoperative perceived taste disturbances. There was a statistically significant difference between the tympanomastoidectomy group and the tympanotomy group (p=0.024), but not between the tympanoplasty group and the tympanotomy group (p=0.52).

Conclusion: Perceived taste disturbances postoperatively are quite common, especially when tympanotomy is performed when there is little or no evidence of active chronic middle ear disease. Patients with evidence of marked middle ear mucosa disease have significantly less taste disturbance following tympanomastoidectomies. These results support the hypothesis that the pre-operative condition of the nerve (whether affected by chronic middle ear inflammation or not) plays a role in postoperative perceived taste disturbances.

THE CYSTIC SPLEEN: A DIAGNOSTIC DILEMMA
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Background: In October 2010 a 77-year-old woman presented to our casualty department with a superficial cystic fluctuant RUQ mass with surrounding erythema that had been present for 9 months. Her first consult was in March 2010, when she presented with a 2-week history of this mass. She reported malaise and pain but no constitutional symptoms. She had no significant medical history or allergies. In August 2009 she had a laparoscopic cholecystectomy in a private clinic to which she was admitted with acute cholecystitis. Intra-operative findings were a gangrenous gallbladder with a short cystic duct. Dissection was difficult and the gallbladder was perforated with stones left in the peritoneal cavity. On clinical examination, the patient was toxic with a tender fluctuant RUQ superficial mass measuring 8x5 cm.

Special investigations: Ultrasound (26 March 2010): superficial right hypochondrial mass with hypo- and hyperechoic components, 3x4cm, 7 arising from the liver. CT chest/abdomen (28 March): normal CT chest. RUQ abdominal wall abscess extending from the liver margin with multiple calculi. This was then treated as a superinfected amoebic liver abscess. Bloods (22 November): elevated inflammatory markers, evidence of renal dysfunction, amoebic/hydatid/hepatitis studies negative. Non-contrast CT abdomen (22 November): RUQ abdominal wall abscess with calculi within.

Management: The patient was taken to theatre for drainage of this collection, and three calculi measuring 1.5 cm in diameter were removed. The wound was irrigated and continued to drain purulent material. There was concern over possible fistulous communication with the colon, but a urograffin enema ruled out this suspicion. The patient's condition settled on antibiotic treatment and saline flushings of the wound.

Discussion: The most common intra-operative complications of laparoscopic cholecystectomy include bleeding and spilled stones. The latter occurs with a frequency of up to 30%. Spilled cholesterol stones pose little threat of infection, but pigment stones may harbour viable bacteria and therefore potentially lead to infectious complications. Recent case reports document a clear potential for long-term infectious complications of retained stones, which is contrary to traditional teaching. The recommendation is avoidance of perforation, a careful search for escaped stones, and liberal use of a plastic retrieval bag for large and friable gallbladders.

Conclusion: This case confirms that spilled stones after laparoscopic cholecystectomy should be actively retrieved and not brushed off as a benign complication.

THE ROLE OF INTRANASAL CORTICOSTEROIDS IN SYMPTOMATICALLY RELIEVING THE EFFECTS OF ADENOID HYPERTROPHY IN HIV-POSITIVE ADULTS
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Background: Adenoidal hypertrophy (AH) is a common finding in adult patients infected with HIV. Although AH is generally a benign condition, it can be symptomatically troublesome with regard to obstruction of the upper airway.Conventionally it can be surgically relieved by adenoidecomy, but this has its risks and restraints in our setting. Is the use of intranasal corticosteroids (INS) a suitable alternative in symptomatically relieving the effects of AH in this group of patients?

Aim of study: The purpose of this study was to evaluate the efficacy of INS (fluticasone propionate) in symptomatically relieving the effects of AH in adult-HIV positive patients over a period of 4 months, compared with a placebo (normal saline).

Methods: Randomised controlled, prospective study at Steve Biko Academic Hospital, Pretoria. Study design: Randomised controlled, pilot, prospective study. Setting: The ENT HIV clinic at Steve Biko Academic hospital, Pretoria. Patient selection: Patients attending the ENT HIV clinic. Inclusions: All HIV-positive patients diagnosed with adenoidal hypertrophy. Exclusions: Patients who had previously used INS, with previous adenoidecomy during adulthood, with suspected nasopharyngeal malignancy, with hypersensitivity to steroids, or with a history of epistaxis.
Thirty patients were enrolled in this pilot study, 20 in the fluticasone group and 10 in the placebo group. All patients were followed up on a fortnightly basis with endoscopic evaluations documenting the adenoid size and symptomatology.

Results: Patients in the fluticasone group showed a significant improvement in symptoms compared with the placebo group (65% v. 5%). There was also a 45% reduction in adenoid size in the fluticasone group when compared with the placebo group.

Conclusion: Fluticasone propionate is effective in relieving the symptomatic effects of adenoidal hypertrophy, in HIV-positive adult patients and can be considered as an alternative therapy to surgery for the management of adenoid hypertrophy.

IMPACT ANALYSIS OF STRIKE IN POLOKWANE HOSPITAL
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Introduction: The poor depend on public hospitals for health care. A strike has a negative effect on all society, but the poor suffer the most when health service is paralysed.

Aim: To determine the impact of the last strike (18 August - 6 September 2010) at Polokwane Hospital and to analyse performance indicators during the strike in comparison with the normal situation as in May 2010.

Methods: Information was collected during the strike from casualty, wards and theatre in Polokwane Hospital. Data for May 2010 were collected from the Hospital Information System, casualty and theatre log books.

Results: During the strike, 27% of elective and 68% of emergency patients were admitted. In the surgical department patients and operations decreased by 67% and 50%, respectively. Compared with the normal situation, mortality increased by 209% in the whole hospital and by 100% in the surgical department.

Conclusions: The strike considerably influenced service delivery (elective admissions and operations) in Polokwane Hospital. The total number of patients and the number of surgical patients admitted during the strike were significantly lower compared with the normal situation in May 2010. Mortality significantly increased during the strike. At provincial level, a special team should be recruited to negotiate and prevent such a predicament.

SEARCHING FOR THE OPTIMAL TIME OF CORRECTIVE SURGERY TO PREVENT AMBYLOPIA IN CHILDREN WITH PLAGIOCEPHALY
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Background: Corrective surgery in plagiocephaly (unilateral coronal suture synostosis) is generally considered a purely cosmetic procedure. This condition is also well known to cause an ipsilateral bony orbit deformity and may result in distortion of orbital contents and debilitating eye complications, most critically amblyopia. The question to be answered is whether the timing of corrective surgery influences the incidence of eye complications.

Objective: We aimed to determine the optimal time of corrective surgery in patients with plagiocephaly to prevent amblyopia.

Method: A retrospective audit was done of all patients with the stigmata of plagiocephaly treated at the Stellenbosch University/ Tygerberg Hospital Craniofacial Unit from 1985 to 2007. Eye pathology was recorded and correlated against age at time of corrective surgery.

Results: Of a total of 170 patients evaluated/treated, 18 demonstrated eye pathology and of these 3 had amblyopia. All the latter were operated on after the age of 4 years.

Discussion: From preliminary results, not statistically analysed, it appears that corrective surgery for plagiocephaly performed before the age of 4 years could possibly prevent eye complications, of which amblyopia is the most serious. Other multicentre data could support this conclusion in future. A review of the literature will be discussed to present current protocols worldwide.

PREDICTION OF LIMB LOSS IN DIABETIC FOOT ULCERS – A SOUTH AFRICAN STUDY
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Introduction: Diabetes mellitus (DM) is the leading indication for non-traumatic amputation worldwide. Most of the amputations are due to sepsis. Various classification systems are used to categorise diabetic foot sepsis and predict limb loss. It is currently unknown which classification system is used locally.

Aims:
1. To determine factors that predict limb loss in patients presenting with diabetic foot sepsis.
2. To compare the three most commonly used systems for grading diabetic foot sepsis and determine which is most practical and predictive of limb loss.

Methods: Prospective longitudinal study of adult diabetic foot sepsis patients admitted to Department of Surgery. Data collected included demography, type of DM, treatment and duration, co-morbidities, previous limb surgery, routine biochemistry, infective markers, findings on local evaluation and evidence of ischaemia. Findings were categorised according to the Wagner, Texas and S (AD) SAD systems.

Results: Of a total of 27 patients (17 females, 81% black, 85% with type 2 DM, 74% on oral therapy), 44% had an amputation (62% major). The C-reactive protein (CRP) level did not predict the level of amputation. Of the patients who had an amputation, 94% were graded 4 or 5 according to the Wagner system.
Methods: Our data show that enoxaparin may be administered during pregnancy, to maintain a peak anti-Xa of 1.0 - 1.2 U/ml.

Main outcomes measured were prosthetic valve thrombosis, bleeding and maternal mortality.

Conclusion: There was no maternal mortality. None of the women developed valvular thrombosis during pregnancy. In all, 2 women developed epistaxis and another had vaginal spotting.

Conclusion: Our data show that enoxaparin may be administered safely during pregnancy to pregnant women with MPHVs when there is dosage adjustment throughout pregnancy to maintain an anti-Xa of 1.0 - 1.2 U/ml.

A COMPARATIVE STUDY OF THE THERAPEUTIC DOSE OF WARFARIN IN HIV-POSITIVE VERSUS HIV-NEGATIVE PATIENTS

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Background: Patients with HIV infection are more prone to a hypercoagulable state compared with HIV-negative patients. Warfarin, a commonly prescribed anticoagulant to treat venous thrombo-embolic disease, has a narrow therapeutic range calibrated by the international normalised ratio (INR). It appears from anecdotal observation that the therapeutic dose of warfarin needs to be higher in HIV-positive patients than in HIV-negative patients. Warfarin dosing is therefore problematic in the HIV setting.

Hypothesis: The average therapeutic dose of warfarin in HIV-positive patients is higher than in HIV-negative patients.

Secondary objective: To assess whether the average therapeutic warfarin dose in HIV patients on antiretroviral medication (ARV) is higher than in HIV patients not on ARV therapy.

Tertiary objective: To assess the induction period of warfarin in HIV-negative patients, HIV-positive patients and HIV-positive patients on ARVs.

Methods: An analytical observational retrospective study was used to assess the average therapeutic dose of warfarin. An observational prospective study determined whether the rate of induction of a therapeutic dose of warfarin is longer. Inclusions: All patients with a proven deep-vein thrombosis requiring anticoagulation; all patients only on warfarin as an anticoagulant; and confirmed HIV status by routine HIV antibody test. Exclusions: Under 18 years of age (paediatrics); patients with unknown HIV status; and patients on other drugs with known anticoagulant or procoagulant effects. Sample size: The study was a three-group comparison of mean dose between HIV-positive patients not on ARVs, HIV-positive patients on ARVs and non-HIV patients. The sample sizes were 26 for each patient group.

Results: The retrospective analysis revealed the mean therapeutic warfarin dose to be 6.29 mg/d (SD 3.29) in 35 HIV-positive patients and 5.32 mg/d (SD 2.67) in 32 HIV-negative patients (difference 0.97 mg). A t-test produced a p-value greater than 0.05 (0.194). Seven HIV-positive patients on ARVs required a mean of 5.71 mg/d (SD 2.27) of warfarin, and 23 HIV patients not on ARVs a mean of 6.47 mg/d (SD 3.57) (difference of 0.75 mg). A t-test produced a p-value greater than 0.05 (0.605).

Conclusion: The results show a trend towards a higher warfarin dose in HIV-positive patients, and also in HIV patients not on ARVs compared with HIV patients on ARVs. However, the differences are not statistically significant.

Currently the number of HIV patients on ARVs is small to make a definitive conclusion. However, the study is still ongoing. The prospective study of the rate of induction of warfarin is also still ongoing with no data available at present.

A REVIEW OF CLINICAL RESULTS OF ENDOVASCULAR INTERVENTION FOR INFRA-INGUINAL OCCLUSIVE ARTERIAL DISEASE IN PATIENTS WITH CRITICAL LIMB ISCHAEMIA

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Introduction: Severe peripheral vascular disease (critical limb ischaemia, CLI) of the lower limb is a common cause for admission to Tygerberg Hospital. World literature advocating endovascular therapy over the conventional open surgery has focused mainly on the subset of patients presenting with intermittent claudication, as opposed to those with critical ischaemia, and has relied heavily on intensive follow-up. We set out to determine the limb salvage rate and mortality of patients undergoing endovascular therapy for critical ischaemia of the lower limb in a resource-limited environment.

Methods: We captured data for 241 patients who underwent endovascular intervention for critical limb ischaemia due to infra-inguinal occlusive arterial disease from 2006 to 2010. We analysed patient risk factors, presenting symptoms, clinical
level of occlusive disease and the procedures undertaken. Follow-up data were collected for all patients where available. A telephonic interview was conducted with patients who could be traced to gain information regarding current limb status and symptomatology. Full or partial follow-up information was available for 228 patients.

Results: Two hundred and fifty-four limbs were treated in 241 patients. Most patients had only one procedure on the index limb; 23 patients had 2 procedures and only 6 patients had 3 procedures. The mean follow-up period was 22 months. The overall survival rate of our study population was 74% at 12 months and 63% at 24 months. The limb salvage rate for the subset of patients for whom full follow-up was available was 80% at 6 months, 71% at 12 months and 69% at 18 months. Thirty-two patients (14%) required open surgery subsequent to endovascular management due to ongoing or recurrent CLI, with a mean interval to surgery of 5 months. Sixty-six patients (32%) for whom full or partial follow-up information was available suffered major amputation of the treated limb at a mean interval of 6 months after the initial procedure. The presence of diabetes and the finding of trifurcation disease were associated with a poor outcome.

Conclusion: An endovascular first approach seems to be justified in the treatment of CLI, even if applied in an environment where regular follow-up and surveillance is not used.

CLINICAL AUDIT OF THE OUTCOMES OF ENDOVASCULAR PROCEDURES IN PERIPHERAL VASCULAR TRAUMA AT STEVE BIKO ACADEMIC HOSPITAL BETWEEN 2006 AND 2011
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Background: The majority of studies have shown evidence on endovascular management of vascular injuries, especially blunt aortic injuries; these have paved the way for the recognition of management of peripheral vascular injuries with an endovascular approach as feasible.

Methods: This is a sample audit of our institutional experience with endovascular surgery in peripheral vascular trauma from January 2006 to January 2011. The series comprised 19 patients, 16 males (84%) and 3 females (16%). The mean age was 30 years, and all had peripheral vascular trauma and other co-morbid injuries. The mode of injury was as follows: gunshot wounds 10 (53%), stab wounds 5 (26%), MVAs 3 (16%) and a fall from a height 1 (5%). All were endovascularly managed, 14 with stenting (73%), 4 with embolisation (21%) and 1 with PTA (5%). General anaesthesia was used in 11 cases (58%) and local in 8 (42%). Some of these patients had haemodynamic instability as a result of their co-morbid injuries. Other non-vascular procedures performed on 3 patients were laparotomy, drainage of a haematoma, and fasciotomies. The vascular injuries involved the subclavian artery (9 cases), carotid artery (2), deep femoral artery (2), superficial femoral artery (2), common femoral artery (1), popliteal artery (1) and brachial artery (1). Diagnoses were pseudo-aneurysm (5 cases), arteriovenous fistula (9), acute injury (6) and occlusion (1). On follow up ankle-brachial indices were obtained and duplex Doppler studies done to ascertain the patency of the involved vessels.

Results: The technical success rate in this series was 100%. Early complications seen were bleeding and wound sepsis, and the one late complication was claudication in 1 patient at 6 months’ follow-up. The mean length of hospital stay was 10 days (range 2 - 46 days), and mean follow-up was 6 months (range 0 - 36 months). In patients who had complications involving bleeding, an endovascular approach was used to correct the complication.

Conclusion: Our experience indicates that endovascular surgery can yield improved outcomes in some patients who present with peripheral vascular trauma. However, open surgery remains the gold standard of treatment, especially for patients with extensive vascular injuries leading to haemodynamic instability.

TRACKING THE COURSE OF COMPLICATED APPENDICITIS THROUGH A REGIONAL HOSPITAL AND DEVELOPING A FEEDBACK MECHANISM TO REFERRING DISTRICT HOSPITALS
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Introduction: There are no easily quantifiable methods to measure and benchmark the quality of surgical services in an area. Using a single common surgical disease as a marker of the quality of care in an area would allow us to establish norms and assess improvements in care. Acute appendicitis is a surgical disease that would be an ideal marker as it is common and poor outcome is not entirely dependent upon technical factors but rather on systematic failures. Based on the overall presentation pattern and the complications of the above cohorts of patients, an attempt was made to construct a scoring system which reflects the quality of acute surgical care in the region.

Methodology: A colour-coded Excel-based system has been used to track all ICU admissions in our institution since 2008. This system allows us to link the patient back to the referral hospital. Data from this tracking system are used to provide direct feedback to each referral hospital on a monthly basis. Since September 2011 all patients with appendicitis treated at our institution have been collated into a prospective database. Their referral point is recorded as well as the duration of symptoms and any associated delay in diagnosis or referral. All complications are recorded and classified as major or minor complications.

Results: Edendale Hospital services four referring district hospitals in southern KwaZulu-Natal. Since September 2010 a total of 61 patients were admitted with acute appendicitis. In 22 a laparotomy was performed, in 36 a Lanz incision and in 3 a laparoscopy. The following findings were noted: early appendicitis (24), perforated/gangrenous appendicitis with localised sepsis (27), and perforated appendix with four-quadrant sepsis (12). There were three negative appendicectomies. There
were 18 patients who required ICU admission, 1 who required a relaparotomy, 14 open abdomens and 2 cases of pneumonia. There were 4 deaths (6%). A total of 16 patients were referred from a district hospital. There were 33 self-referrals directly to our institution and 10 referrals from GPs or local clinics. The average duration of symptoms prior to seeking any attention was 2.6 days. The average delay in diagnosis once contact has been made with the health care system was 8 hours.

**Conclusion:** Patients tend to present with a long duration of illness before seeking medical attention. Those who were initially assessed in peripheral hospitals experienced a significant delay before transfer to Edendale Hospital for definitive management. This reflects a poor surgical service, and interventions are necessary to improve the quality of our service. The rate of major complications may be a useful marker for the quality of surgical care; however, individual hospitals see too few cases for it to be a useful grading system for specific institutions.

**LAPAROSCOPIC APPENDECTOMY: TAKING ON ALL COMERS**

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**Introduction:** Laparoscopic appendectomy is controversial at best and is not widely practised. We have embraced this modality of treatment for all patients including patients with generalized peritonitis from ruptured appendicitis.

**Aim:** The aim of this presentation is to document our experience with laparoscopy in appendicitis over a 1-year period.

**Methods:** All the records of patients with acute appendicitis, generalized peritonitis from a perforated appendix and appendix mass were reviewed. The study period was March 2010 - March 2011, and all these patients were treated laparoscopically.

**Findings:** During this time 81 patients were seen (48 males and 43 females); the mean age was 23.6 years (range 6 - 49); the mean operative time was 120 minutes, and operative findings were an acutely inflamed appendix in 39 patients, a perforated appendix in 37, and a normal appendix with gynaecological pathology in 5. Average hospital stay was 3 days. Complications were pelvic collections in 6 cases. In 3 cases conversion to an open procedure was required.

**Conclusions:** Laparoscopic appendicectomy is feasible for the majority of cases, including complicated ones, and pelvic collections are uncommon.

**LATE REFERRALS, AN EFFECT ON APPENDECTOMY AT POLOKWANE HOSPITAL, LIMPOPO PROVINCE**

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**Introduction:** Daily reports during handover meetings in the Department of General Surgery showed that the number of patients with appendicitis decreased during a recent strike in comparison with the normal situation. Owing to closing of peripheral hospitals, it was expected that there would be more referrals.

**Aim:** To determine rates of appendicitis before, during and after the strike at Polokwane Hospital.

**Method:** All patients with appendicitis admitted to Polokwane/Mankweng Hospital 20 days before (29 July - 17 August), during (18 August - 6 September) and after (7 - 26 September) the strike in 2010 were reviewed. The survey included other regional hospitals in Limpopo province where surgeons were employed.

**Results:** During the above time periods, 23, 6 and 21 patients with appendicitis, respectively, were admitted to Polokwane Hospital; 59%, 50% and 24% of these patients had complications. The most common complication was perforation with peritonitis.

**Conclusions:** Patients with appendicitis came to hospital in lower numbers than was expected during the strike. It is assumed that many emergencies, including appendicitis, were treated in private hospitals. In Limpopo, in the normal situation as well as during the strike, most appendicitis patients are referred late to the PMHC.

**PREFERENCES WITH REGARD TO POSITION DURING DIGITAL RECTAL EXAMINATION AND PERCEPTIONS OF PAIN DURING AND AFTER DIGITAL RECTAL EXAMINATION AMONG MEN WITH LOWER URINARY TRACT SYMPTOMS**

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**Introduction and objectives:** The aims of this study were to determine the position for digital rectal examination (DRE) preferred by men with lower urinary tract symptoms (LUTS) and to assess patient perceptions of pain prior to and after DRE.

**Materials and methods:** Men with LUTS were requested to indicate on a pictogram their preferred position during DRE, and to indicate on a 10-point pictogram scale how much pain they anticipated prior to DRE and how much pain they experienced during DRE. The protocol was approved by the institutional ethics committee and written informed consent was obtained. Statistical analysis was performed using Student's t-test and Fisher's exact test (p<0.05 statistically significant).

**Results:** A total of 80 men, mean age 63 years (range 33 - 85), were evaluated from August 2009 through August 2010. The patients’ preferred position for DRE was left lateral in 58%, supine in 22%, standing in 15% and knee-chest in 5%. The position used during DRE was supine in 83% and left lateral in 17%. The mean pre-DRE pain score was 3.3 (range 0 - 10) and the mean post-DRE score 0.94 (range 0 - 8) (p=0.0001). There was a significant correlation between pre- and post-DRE scores (p=0.01). Comparing men with educational grade 0 - 7 with those with educational grade >10, there was no difference in mean pre-DRE score (3.58 v. 3.27) but the post-DRE score was lower (0.54 v. 1.27, p=0.073). Comparing the patients who...
underwent DRE in the preferred versus non-preferred position, there was no significant difference between pre- and post-DRE scores (3.46 v. 0.93 and 3.23 v. 0.94, respectively). Comparing men aged ≤60 versus ≥70 years, there was no significant difference between pre-DRE (3.32 v. 3.10) or post-DRE scores (0.87 v. 0.62).

**Conclusion:** The majority of men preferred to undergo DRE in the left lateral or supine position. Patients’ expectation of pain prior to DRE was quite low (3.3/10), and the post-DRE perception of pain was 3 times lower than anticipated by the patient. Pain perception was not significantly associated with age or DRE in the preferred versus non-preferred position, but patients with lower educational level had slightly lower post-DRE pain.

**PROSPECTIVE COMPARISON OF A NEW VISUAL PROSTATE SYMPTOM SCORE VERSUS THE INTERNATIONAL PROSTATE SYMPTOM SCORE IN MEN WITH LOWER URINARY TRACT SYMPTOMS**

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**Objective:** The International Prostate Symptom Score (IPSS) to assess lower urinary tract symptoms (LUTS) was designed to be self-administered by the patient and requires a high degree of literacy, which is problematic in developing countries with low literacy levels. The objective of this study was to investigate the correlation between the IPSS and a new visual prostate symptom score (VPSS) using pictures rather than words.

**Methods:** Three IPSS questions (Q2 – urinary frequency, Q7 – nocturia and Q5 – weak stream) and the quality of life question were substituted with illustrated versions in the VPSS. Men presenting with LUTS were given the IPSS and VPSS to complete. Peak (Qmax) and average (Qave) urinary flow rates were measured. Statistical analysis was performed using Fisher’s exact and Spearman’s rank correlation tests.

**Results:** The educational level of the 96 men evaluated was as follows: 62% grade 8 - 12, 28% grade 1 - 7, 4% no schooling, and 6% university. The questionnaire was completed without any assistance by 62% and required assistance in 87% v. 24%, and the VPSS required assistance in 32% v. 53% for IPSS versus 82% for VPSS (p<0.014). There were significant correlations (p<0.001) between total IPSS versus VPSS scores, IPSS and VPSS versus Qmax and Qave, and individual VPSS parameters (frequency, nocturia, weak stream and quality of life) versus their IPSS counterparts. Weak stream had a significant correlation with Qmax in the VPSS (question 3) (p<0.0003) but not in the IPSS (question 5) (p=0.2936).

**Conclusion:** The VPSS correlates significantly with the IPSS, Qmax and Qave, and can be completed without assistance by a greater proportion of men with limited education, indicating that it may be more useful than the IPSS in such patients.

**THE 'PCA3 (PROSTATE CANCER GENE 3) DENSITY': A NEW DERIVATIVE IN PREDICTING THE PRESENCE OF PROSTATE CARCINOMA**

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**Background:** The PCA3 assay, a novel urinary biomarker, has shown significant potential in predicting the presence of prostate cancer. For the first time we attempted to evaluate the value of incorporating the prostatic volume into this PCA3 assay score. We plan to evaluate this new derivative, and assess its performance as a predictor of prostate carcinoma, and have therefore labelled it the ‘PCA3 density’ score.

**Methods:** We evaluated data of 105 consecutive South African men scheduled for a prostatic biopsy, with a cancer incidence of 42.9%. The PCA3 score was calculated as PCA3 mRNA/PSA mRNA × 1 000, using the PROGENSA TM assay. We retrospectively calculated the ‘PCA3 density’ score as PCA3 score/prostatic volume. The respective ROC analysis of the PCA3 score and the newly derived ‘PCA3 density’ score was calculated and compared.

**Results:** The PCA3 score performed with an AUC score of 0.7054 (95% CI 0.5990 - 0.8117), while the conventional cut point of 35 resulted in a sensitivity of 77.7% and a specificity of 50% respectively. The ROC analysis of the ‘PCA3 density’ score was 0.7037 (95% CI 0.5980 - 0.8094) and the absolute cut point of 1 resulted in a sensitivity of 80% and specificity of 50%. When a cut point of 6 was applied, a sensitivity of 35.7% and specificity of 86.7% was observed.

**Conclusion:** A ‘PCA3 density’ score cut point of 1 performed better than a PCA3 score with a cut point of 35 in this setting. The ideal cut point of the ‘PCA3 density’ score and its performance across different risk stratification groups needs further evaluation in other populations and larger data sets to confirm or refute the utility of this new derivative.

**PAEDIATRIC HEAD INJURIES: EXPERIENCE FROM DURBAN**

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**Background:** Trauma is the most common cause of death in the paediatric population. The purpose of this study was to investigate the causes, management and outcome of paediatric head injuries.

**Methods:** Retrospective analysis of paediatric patients with head injuries treated at King Edward VIII Hospital from 1999 to 2001. Data collected included demographics, mode of injury, clinical presentation and outcome.

**Results:** Five hundred and nine patients were enrolled, of whom 331 were male (male/female ratio 2:1). The mean age was 71.99 (SD 36.8) months (range 2 weeks - 180 months). Injuries were
due to motor vehicle crashes (324), falls (121), assault (30) and other (23), and the cause was unknown in 11 cases; 48 patients (9%) were admitted with severe head injuries (GCS ≤8). CT brain showed brain oedema (18 cases), subdural haemorrhage (30) and extradural haemorrhage (15), and the remainder had no intracranial pathology. The majority of patients were managed with neurological observation in the paediatric surgical ward, while 41 patients (8%) underwent surgical intervention, namely plastic surgery (1), ICP monitoring (2), suturing and debridement (9) and haematoma evacuation (3); the remainder were unspecified. The mean hospital stay was 4.44 (SD 10.53) days. Sixteen patients died in hospital, giving a mortality rate of 3%. There were no patients with long-term neurological deficits.

Conclusion: Few paediatric patients are admitted with severe head injury (GCS ≤8); the overwhelming majority result from blunt injury, specifically motor vehicle crashes. Management in most cases requires simple neurological observation in a general ward with a good prognosis. Long-term neurological sequelae are uncommon in children.

LAPAROTOMY FOR BLUNT ABDOMINAL TRAUMA IN PIETERMARITZBURG
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Introduction: This report reviews all the patients who underwent laparotomy for blunt torso trauma at our institution over a single year.

Methods: A prospective trauma registry is maintained by the surgical services of the Pietermaritzburg Metropolitan Complex. This registry was interrogated retrospectively. All patients who required admission for blunt torso trauma over the period September 2006 - September 2007 were included for review. Proformas documenting mechanism of injury, age, vital signs, blood gas, delay in presentation, length of hospital stay and ICU stay and operative details were filled.

Results: A total of 926 patients were treated for blunt trauma by the Pietermaritzburg metropolitan services during the period under consideration. A cohort of 65 (8%) required a laparotomy for blunt trauma during this period. There were 17 females in this group. The mechanism of injury was MVA (27), pedestrian vehicle accident (PVA) (21), assault (5), fall from height (3), bicycle accident (6), quad bike accident (1) and tractor-related accident (2). The following isolated injuries were discovered at laparotomy liver (9), spleen (5), diaphragm (1), duodenum (2), small bowel (8), mesentery (8) bladder (10), gallbladder (1), stomach (2), colorectal (2) and retrohepatic vena cava (1). The following combined injuries were discovered: liver and diaphragm (2), spleen and pancreas (1), spleen and liver (2), spleen and aorta and diaphragm (1) spleen and bladder (1), small bowel and bladder (2). There were 18 (26%) patients who required relaparotomy in this series. In 10 patients Bogota bag closure was needed. The mortality rate was 18 (26%). There were 6 deaths from massive bleeding, all within 6 hours of operation. There were 3 deaths from renal failure and the remaining 9 died of multiple organ failure. There were 8 (7%) negative laparotomies. In the negative laparotomy group false-positive CT scan findings were a problem in 3. In 1 hypotension and a fractured pelvis on admission prompted laparotomy, and in the other patients clinical findings prompted laparotomy. All patients undergoing negative laparotomy survived. There were 10 pelvic fractures, 5 lower limb fractures, 2 spinal injuries, 4 femur fractures and 2 upper limb fractures. CT scan was obtained in 25 patients. In 20 systolic BP on presentation was <90 mmHg, and in 41 the pulse rate was >110. In 16 patients there was a base excess of <-4 on presentation.

Conclusion: There is a high volume of significant blunt trauma in Pietermaritzburg. The ratio of hollow visceral to solid visceral trauma is different to that reported in the literature. CT scan is very accurate at predicting intra-abdominal injury and influenced management decisions significantly. Managing significant blunt trauma without liberal use of radiological imaging is inappropriate.

THE INCIDENCE AND SIGNIFICANCE OF ISOLATED FREE FLUID ON ABDOMINAL CT SCAN FOLLOWING BLUNT ABDOMINAL TRAUMA
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Introduction: This report reviews the number and outcome of patients who, after sustaining blunt abdominal trauma, are found to have isolated free fluid on initial CT scan at a tertiary metropolitan trauma service in South Africa.

Patients and methods: CT scans performed for blunt abdominal trauma between September 2009 and April 2011 were identified. The case notes were reviewed for those patients found to have intra- or extra-peritoneal fluid present on initial scan. Outcome measures of operative or non-operative management, operative findings, complications, length of stay and mortality are reported.

Results: A total of 121 CT scans were performed over 20 months for patients who had sustained blunt abdominal trauma. There were 84 males and 31 females in the group, and 16 patients were under the age of 16. MVAs accounted for 53 incidents, PVAs for 31, assault for 23, falls from a height for 7 and other mechanisms for 2. Free fluid was detected on initial CT scan in 36 cases. The mechanism of injury in these 36 patients was MVA 16, PVA 9, assault 8 and fall 3. Evidence of hollow organ injury was found in 7; bladder injury was suggested in 4 of these scans (3 intraperitoneal and 1 extraperitoneal bladder rupture confirmed at laparotomy). CT findings consistent with small-bowel injury were found in the other 3 cases (1 duodenal and 1 jejunal injury confirmed at laparotomy). Evidence of solid organ injury was found in 21 cases. There were 8 splenic injuries, 7 liver injuries, 2 pancreatic injuries, 2 renal injuries and 2 combined solid organ injuries (1 liver and spleen, 1 liver, spleen and kidney). There were 8 patients who had free fluid demonstrated on initial CT with no evidence of solid or hollow viscous injury. Operative management was undertaken in 3 cases: 1 patient underwent a diagnostic
Background: Epidemilogical studies report that injury from intentional and unintentional causes remains the leading cause of mortality among people aged <44 years (children, adolescents and young adults) and the fourth leading cause of death over all age categories. Data on the epidemiology of injuries such as socio-economic inequities, alcohol abuse, long-term survival and trends are available in developed countries. Only 20 countries worldwide including South Africa (the majority being in developed Western settings) provide high-quality death registration data to be used for estimating injury mortality. Research on trends and epidemiology of injuries in sub-Saharan African health centres including Mthatha Hospital Complex, Eastern Cape, South Africa, is still in the developmental stages. Data from Mthatha Hospital Complex ICU are needed to guide future epidemiological investigations and to develop programmes for preventing injuries and ameliorating the management of their consequences.

Aim: To describe the epidemiological patterns and management of injured and non-injured patients admitted to the ICU and to determine the trends in these patterns over time.

Methods: This referent case study was based on annual audits from 1994 to 2004 at the ICU of Mthatha Hospital Complex. Data collected in 1994 - 1998 were compared with those collected in 2000 - 2004.

Results: A total of 5 709 records were analysed, 3 331 in 1994 - 1998 and 2 378 in 2000 - 2004. Admissions were more frequent in males and patients aged 15 - 39 years. Patients admitted for trauma 42.4% were more frequently operated on (p<0.0001) than those admitted for non-trauma (27.5%). Head injuries, abdominal injuries and polytrauma were the leading causes of admission (40.4%, 25.6% and 11.1%, respectively) and death (52.6%, 16% and 10.8%, respectively) among the operated injuries. Intestinal obstruction complicated by peritonitis, appendicitis and perforated typhoid ulcer were the leading causes of admission among operated non-trauma cases (27.2%, 17.4% and 10.5%, respectively). Likewise, intestinal obstruction, other conditions and perforated typhoid ulcer were the leading causes of death (33.1%, 23.8% and 13.9%, respectively). Admission for trauma (48.8% v. 49.9%), admission for non-trauma conditions (51.6% v. 50.1%), trauma-related death (13.6% v. 13%) and non-trauma related deaths (11.5% v. 11.9%) did not vary (p>0.05%) between 1994 - 1998 and 2000 - 2004.

Conclusion: Operated males and young patients are more frequently admitted to the ICU. Sufficient specialist staff, including surgical subspecialties, are urgently needed to reduce mortality. Programmes and policies to prevent injuries and water sanitation should be implemented.
PROFILE OF THYROID DISEASES TREATED IN THE SURGICAL DEPARTMENT, POLOKWANE/MANKWENG HOSPITAL COMPLEX (PMHC), LIMPOPO PROVINCE

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Introduction: Nodular thyroid disease is common throughout the world. Although most thyroid nodules are benign in nature, cancer is an occasional incidental finding. There has been no formal study on this disease in Limpopo province.

Aim: To investigate the profile of thyroid diseases in patients who present with nodular thyroid in the Surgical Department, PMHC.

Methods: A retrospective 6-year (2003 - 2008) study of all histologically diagnosed patients within nodular thyroid at PMHC.

Results: Ninety patients with nodular thyroid were referred to the Surgical Department. There were 85 women (94%) and 5 men, age range 20 - 80 (52% were between 41 and 60 years old). Fifty-three patients were subjected to lobectomy, 31 to subtotal and 6 to total thyroidecomy. Pre-operative histological findings showed 80 patients (89%) to have benign thyroid conditions (54% adenomas and 35% goitre) and 10 (11%) to have follicular (8%) and papillary (3%) cancers; 5 out of 7 cancers were detected pre-operatively by nuclear scanning. In 46 cases (51%) histological examination also revealed calcification, hemosiderin and cholesterol deposits. In 6 cases (7%) a low thyroid-stimulating hormone level was observed.

Conclusions: The rate of thyroid cancer in our centre is consistent with the findings elsewhere in endemic goitrous regions. Thyroid nodules were much more frequent in women. Degenerative signs in the thyroid were common but with a euthyroid pattern.

INCIDENCE OF INCIDENTAL CANCER IN MULTINODULAR GOITRE POST THYROIDECTOMY

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Introduction: The risk of malignancy in the background of multinodular goitre (MNG) is 7.2%. The gold standard for the diagnosis of thyroid pathology is fine-needle aspiration cytology (FNAC). While unsuccessful or indeterminate FNAC will prompt a lobectomy as biopsy, the concern is the case that is clearly reported as benign, which does not always require surgery, therefore carrying the risk of missed malignancy.

Aim: To determine the demography of patients undergoing surgery for MNG, to evaluate the prevalence of incidental cancer in MNG, and to establish the histological types of incidental cancer in MNG.

Methods: A retrospective audit. Records of patients who had thyroidectomy preceded by FNAC from January 2005 to December 2010 were reviewed. Data collected included demography, thyroid function test, fine-needle aspiration cytology, final histology, and incidence of missed malignancy.

Results: Records of 167 operations, 47% for MNG based on FNAC; average age 46 years (range 16 - 79). Total thyroidecomy was performed in 45.5%. MNG was confirmed in 91%. Incidental malignancy was found in 4 cases (5.1%), all papillary and predominantly follicular variant (75%).

Conclusion: Although FNAC is reliable for pre-operative diagnosis, half of thyroidectomies at Chris Hani Baragwanath Academic Hospital are done for multinodular goitre. The prevalence of incidental cancer in resected specimens with prior FNAC diagnosis of MNG is 5%. The most common histological subtype of incidental thyroid cancer found in the background of MNG is the follicular variant of papillary carcinoma.

ANTIBIOTIC SUSCEPTIBILITY PATTERNS OF MICRO-ORGANISMS ISOLATED BETWEEN 2005 AND 2010 IN THE SURGICAL DEPARTMENT, POLOKWANE HOSPITAL, LIMPOPO PROVINCE

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Introduction: Successful management of infections in every hospital requires knowledge of predominant species of microbial isolates, their virulence and trends in antibiotic susceptibility.

Aim: To describe the antibiotic susceptibility patterns of micro-organisms isolated between 2005 and 2010 in the Surgical Department, Polokwane Hospital.

Methods: This was a 6-year retrospective study of all strains collected from surgical patients with delayed wound healing, based on results from the National Health Laboratory Services.

Results: The average number of isolated micro-organisms was 160 per year. The commonest were coagulase-negative staphylococci and S. aureus (with less than 25% of methicillin-resistant S. aureus (MRSA) strains), P. aeruginosa, Enterobacteriaceae, K. pneumoniae and E. coli. In 2009 - 2010 a Serratia species outbreak was observed. The most effective antibiotics for staphylococci were clindamycin and cotrimoxazole, Enterobacteriaceae were most sensitive to piperacillin/tazobactam, amikacin and ciprofloxacin. P. aeruginosa was most sensitive to amikacin and ciprofloxacin. The greatest degree of resistance to all the drugs was found in Serratia spp. followed by Klebsiella spp. The decrease of susceptibility was observed from over 90% in 2005 to carbapenem, cephalosporins and quinolones and 80% to penicillins and aminoglycosides to 30% to penicillins, 50% to cephalosporins, and 70% in other groups in 2010. Statistically significant differences in susceptibility were identified in 2010 compared with 2009.

Conclusions: This is the first report on the outbreak and antimicrobial susceptibilities of Polokwane Hospital isolates. These data can assist treatment decisions and form a baseline for further surveillance.
Maggot debridement therapy (MDT) has been known for ages. It was mentioned in the 16th century by military surgeons, who noted the healthy appearance of wounds infested with maggots. Maggots were used extensively after World War II to clean wounds, but fell into disuse after the development of antibiotics. Interest developed again during the last 30 years when antibiotic resistance became a problem.

A maggot laboratory was donated to the Department of Surgery at Steve Biko Academic Hospital in June 2007, so that maggots could be used on complex wounds. The laboratory is managed by a fly technologist. We looked at the results of the first 4 years of MDT at our hospital.

Patients and methods: The maggots we use are from the species *Lucilia sericata*, the green bottle blow-fly, which is kept in fly cages. When maggots are needed, the flies are stimulated to oviposit by feeding with carrion (liver). The eggs are isolated and sterilised before hatching, which happens in 24 hours. The larvae (maggots) produced are placed on the wound and covered with an air-permeable dressing to allow oxygen to enter. These are left for 3 - 7 days (the life expectancy of the maggots) before dressing removal. If the wound is not clean, a further application of maggots is done.

Results: Over 4 years a total of 108 patients underwent MDT, for a total of 255 applications. These patients are in the older age group, with co-morbidities, mostly diabetes (66%) and hypertension (30%). A third of the patients had had amputation of a toe (35%) that became septic, and 18% ended with a more proximal amputation of the limb. The majority proceeded to wound management with other dressings after successful wound debridement with the maggots.

Conclusion: MDT is a good alternative to surgical debridement of some septic wounds in patients group with co-morbid diseases that increase the risk associated with anaesthesia. It can be used on an outpatient basis, reducing bed occupancy in the hospital. It is a cost-effective treatment for chronic wounds, saving on beds, hospital admission and costly inpatient management.

**EMPIRIC ANTIBIOTIC COVER IN ACUTE HAND INFECTIONS: SHOULD WE COVER FOR MRSA?**

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Background: There has been a significant increase in community-acquired MRSA hand infections over the past 10 years worldwide. MRSA hand infections are aggressive and can lead to stiffness, contractures and amputations. Delayed and/or inappropriate treatment is associated with a threefold increase in mortality.

The objective of this study was to establish the prevalence of MRSA in our institution and to determine whether we should empirically cover for MRSA in our patients with acute hand infections. It is recommended that MRSA be empirically covered for if the local prevalence exceeds 10 - 15%.

Patients and methods: The study was done at Kalafong Hospital, a secondary institution affiliated to a tertiary hospital. The population includes children and adults, both males and females. Consecutive patients presenting to the orthopaedic department with acute hand infections were selected during the period February 2010 - April 2011. Pus and tissue specimens were sent for MC+S. The organisms isolated and their sensitivities were recorded.

Results: A total of 103 patients were seen; of these, 8 had no MC+S results and 2 had no organisms cultured. Of the remaining 93
patients, only 1 had MRSA infection (1.075%). The other patients had a variety of organisms, as follows: methicillin-sensitive S. aureus 48 (51.6%), S. epidermidis 5 (5.3%), S. mitis 4 (4.3%), E. cloacae 4 (4.3%), S. lugdunensis 3 (3.2%), S. pyogenes 2 (2.1%), and mixed organisms 12 (12.9%). Fifty-seven patients were males and 36 were females, the average age was 45 years (range 3 - 72 years), and 35% had spontaneous infections and the others infections from bite wounds, lacerations and wood splinters.

Conclusion: The current MRSA prevalence in acute hand infections at our institution is 1.1%. Based on the low prevalence, we should not empirically cover for MRSA in our patients with acute hand infections.

BIOFILM DETECTION USING INFARED SPECTROSCOPY: PILOT DATA
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The burden of chronic wounds to patients and the challenge they present to health care workers is enormous. Acute wounds heal in an orderly manner by coagulation, followed by an inflammatory phase with re-formation of the extracellular matrix, cell proliferation and finally remodelling with scar formation. Chronic wounds form when one of more of the orderly steps in the acute wound healing process becomes unregulated. A wound infection and the establishment of a bacterial biofilm within the wound space is one way in which a chronic wound may form. A biofilm, which can form in any moist environment, consists of the bacterium immobilised in a complex proteoglycan matrix that protects the bacterium from antibiotics.

Methods: Biofilms were established in chronic wounds created in a rat model. The biofilms were harvested and mounted on sodium chloride slides and the infrared spectrum measured.

Results and conclusion: Representative spectra could detect the pattern of molecular groups within the wound space and indicated differences when a biofilm infected the wound, suggesting that FTIR may be a useful technique to detect biofilms. Spectra need to be obtained from human wounds infected with biofilms from several hospitals.

DOI:10.7196/SAJS.1523