SAJS
Abstracts

# 36th Annual Meeting of the Surgical Research Society of Southern Africa

## Department of Surgery, University of Cape Town, 3 and 4 July 2008

### SIGMOID VOLVULUS IN KWAZULU-NATAL TEACHING HOSPITALS

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**INTRODUCTION:** Sigmoid volvulus demonstrates geographical variation. The condition is more common in developing countries especially in Africa where it occurs in young African male patients.
**AIM:** To establish clinicopathological trends, to document the site of torsion and to assess outcome of management in patients with sigmoid volvulus.
**PATIENTS AND METHODS:** Prospective study of patients presenting with sigmoid volvulus at the KwaZulu-Natal Teaching Hospitals. Initial management included sigmoidoscopic decompression and preparation for elective surgery. Indications for emergency surgery were failure of detorsion at sigmoidoscopy, evidence of bowel ischaemia at sigmoidoscopy and the presence of peritonitis. Data collected included demographics, clinical presentation, operative findings and outcome. For a period of 7 years (2001-2007)
**RESULTS:** 117 patients of average age 40.8 ± 17.1 years have been enrolled (M: F 13:1) of whom 2 were White and the rest were African. Management was by emergency surgery (76), elective surgery (32), no surgery (8) and autopsy (1). In patients undergoing emergency laparotomy the level of the twist was at the pelvic brim in all. 42 patients had gangrenous bowel and 68 patients had viable bowel. Sigmoid resection was accompanied by primary anastomosis (70) and Hartmann's procedure (38). Complication and mortality rates were 44% and 17% respectively. Mortality rate for emergency and elective surgery was 22% and 13% respectively (p=0.519), and that for primary anastomosis and Hartmann's procedure were 14% and 29% respectively (p=0.223). Mortality rates for gangrenous and viable bowel were 29% and 14% (p=0.183). Hospital stay was 9.3 ± 7 days.
**CONCLUSION:** The clinicopathological picture of sigmoid volvulus resembles that in the rest of Africa in that it affects predominately young African males. The level of the twist is at the pelvic brim. The type of surgery, the type of anastomosis and the viability of the bowel did not influence outcome in this series.

### THE SPECTRUM OF ADULT INTUSSUSCEPTION

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**INTRODUCTION**: Intussusception is uncommon in the adults and is usually of a more sinister nature than in the paediatric population. This review looks at the spectrum of presentation and pathology in adult intussusception.

**METHODS**: We approached both the private and public sectors in both Durban and Pietermaritzburg and requested information regarding any patients they had seen with intussusception. This is both a retrospective (from 2004) and prospective (from 2006) survey.
**RESULTS**: Twenty- two patients were identified with twenty-three intussusceptions, one patient presented with two sites of intussusception. The gender make up comprised of sixteen males and six females. The average age of presentation was 53. A pre-operative diagnosis was made in 8 of the 22, CT scan diagnosed 6 and the remaining 2 were diagnosed at colonoscopy and ultrasound respectively. The rest were diagnosed intraoperatively. The lead points were adenocarcinoma (4), amoebic colitis (2), Gastro intestinal stromal tumour (2), lymphoma (1), lipoma (1), Peutz Jeghers (1), inflammatory myofibroblastic tumour (1). No lead point could be identified in two cases and the lead points in the remaining six were unable to be determined due to necrosis. The anatomical descriptions of the intussusceptions were jejuno-jejunal (3) ileo-ileal (10) and ileo-colic (9) and colo-colic (1). Resection was performed in twenty, two early post operative intussusceptions with no palpable lead point being reduced intra operatively. The Peutz Jeghers patient had resection of the lead point via an enterotomy.
**CONCLUSION:** Adult intussusception is rare and is usually secondary to a lead point. One third present with subacute symptoms and CT scan is their preferred diagnostic modality. Resectional surgery is the mainstay of treatment.

### AN ANALYSIS OF GASTROINTESTINAL STROMAL TUMOURS AT PRETORIA ACADEMIC HOSPITALS (2001- 2008 )

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**INTRODUCTION:** Gastrointestinal stromal tumours ( GIST ) are the most common mesenchymal tumours of the gastrointestinal tract. They occur in the stomach most frequently. Tumour size and mitotic index predict behaviour. Primary resection, with wide margins, is the treatment of choice, but has a high recurrence rate. The tyrosine kinase inhibitor, imatinib mesylate, holds promise as chemotherapeutic agent for these tumours.
**AIM:** To analyse the presentation and management of patients with GIST at Pretoria Academic Hospitals.
**METHOD:** Retrospective review of cases diagnosed with GIST at our hospitals from April 1999 to September 2007. Information was obtained from the Anatomical Pathology laboratory records and hospital patient records. Patient demography, symptomatology, tumour size and management were retrieved.
**RESULTS:** A total of 35 cases were found. Their ages ranged between 15 and 82 years. Male to female ratio was 2:1. The stomach was the anatomic site most frequently affected. All patients with complete records presented with fatigue and weight loss. The largest resected tumour measured 20x30x7 cm. All 35 cases diagnosed were c-KIT positive.

**DISCUSSION:** Although the cells of Cajal (cell from which GIST originate ) are mainly found in the GI tract, one of our cases presented with a retroperitoneal GIST. In other studies the second most common anatomic site was the small intestine, but in our case it was the rectum.
**CONCLUSION:** GISTs in Pretoria patients present late and with non-specific symptoms .They are often not suitable for complete resection.

### HISTOLOGICAL AUDIT OF APPENDICECTOMY SPECIMEN AT PRETORIA ACADEMIC HOSPITAL COMPLEX

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**INTRODUCTION:** Acute appendicitis is a common condition. Appendicectomy done on clinical grounds is associated with a normal histological findings of up to 20%. Carcinoid tumours and appendiceal adenocarcinoma are often diagnosed on appendix specimen removed for acute appendicitis.

**AIM:** To determine the incidence of normal histological finding in specimens submitted for histology post appendicectomy at Pretoria Academic hospital complex.
**METHOD:** Retrospective study of histology reports of post appendicectomy from National Health Laboratory Services from 1999 to 2005. Analyzed were patient's demography and histology. Histological findings were divided into 4 groups: positive, negative, incidental and other.
**RESULTS:** Total number reviewed was 983 appendix specimens, 463 (47%) were males and 520 (53%) were females. Positive findings 641 (65%), negative 186 (19%), incidental 83 (9%) and other 73 (7%).
**DISCUSSION:** Included under incidental and other findings was Carcinoid tumour, Lymphoma, Turbeculosis, Schistosimiasis, Yersinia, Cystadenoma, Fibrous obliteration and Paneth cell metaplasia. Incidental finding refers to appendicectomy done during other operations. Other group include any histological finding without inflammation.
**CONCLUSION:** Negative histology of 19% is comparable with other centers and is higher in females.

## SELF-EXPANDING METAL STENTS (SEMS) AS A PRIMARY MODALITY OF TREATMENT FOR MALIGNANT GASTRIC OUTLET OBSTRUCTION IN CAPE TOWN

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**AIM:** To prospectively evaluate the use of SEMS as a primary intervention for relieving malignant gastric outlet obstruction in a resource limited environment in South Africa.
**BACKGROUND:** Gastro-duodenal obstruction secondary to advanced malignancy is often a difficult symptom to palliate. Surgical bypass is frequently inappropriate or contra-indicated due to advanced disease or co-morbidity. Primary stenting aims to rapidly restore enteral intake with minimal morbidity. SEMS enables patients with limited life expectancy to be independent of parenteral fluid administration and facilitates early discharge. SEMS have gained international acceptance as an alternative to surgery and are a useful adjunct to management where expertise, operating time, limited hospital beds and other resource limitations exist. This is the first reported series using SEMS for palliation of malignant gastro-duodenal obstruction in Africa.
**METHOD:** Patients with clinical and endoscopically proven malignant gastro-duodenal obstruction and a relative contra-indication to surgical bypass were eligible. A side-viewing duodenoscope combined with fluoroscopic screening was used to place the SEMS under direct vision. Data was collected prospectively until death from November 2004 to November 2007.
**RESULTS:** 42 patients, median age 64 years (range 39-84) had attempted SEMS placement. The obstruction was due to antral gastric adenocarcinoma (n=17), pancreatic adenocarcinoma (n=17), duodenal adenocarcinoma (n=1), cholangiocarcinoma (n=3), gallbladder carcinoma (n=1) and extrinsic compression from metastatic adenocarcinoma (n=3). Relative contraindications to surgery were locally advanced tumour (n=23), metastatic disease (n=12) and co-morbidity (n=7). The site of obstruction was gastric antrum (n= 17), D1D2 (n=11) and D2D3 (n=13) and D3D4 (n=1). There were four technical failures (9.5%). In the 38(90.5%) technically successful placements, 36 (94%) patients resumed oral intake (n=4 liquid, n=15 soft diet, n=17 full diet) and two failed (second obstruction distal to gastro-duodenal obstruction). 14 patients required additional biliary stenting. The median time from stent to discharge was two days (range 1-8). Median survival following SEMS was 41 days (range 4 – 321) with 10 patients still alive. Two patients were lost to follow-up. One patient (antral gastric carcinoma) required a three unit blood transfusion following stent placement. There were no other immediate complications.
**CONCLUSION:** SEMS has a high technical success rate (90.5%) and is able to rapidly restore enteral intake in 94% of patients with malignant gastro-duodenal obstruction who are unsuitable for surgery in a resource-limited environment.

## A PROSPECTIVE AUDIT OF DIAGNOSTIC LAPAROSCOPY IN THE DIAGNOSIS OF ABDOMINAL TUBERCULOSIS

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**INTRODUCTION:** HIV/AIDS has resulted in a resurgence of abdominal tuberculosis in South Africa. Confirming the diagnosis can be difficult. The role of laparoscopy in making the diagnosis is undefined. This prospective audit looks at the role of laparoscopy in establishing the diagnosis of abdominal TB.
**METHOD:**All patients with clinically suspected but histologically or microbiologically unconfirmed abdominal tuberculosis are jointly assessed by an infectious diseases physician and a general surgeon. If a histological diagnosis of TB cannot be made by any alternative route then the patient will be offered a formal diagnostic laparoscopy under general anaesthetic.
**RESULTS:** Since January 2008 twenty four patients with suspected abdominal Tuberculosis have been referred for assessment. (12 males, 12 females, mean age 34.7 (14-73).) Nine patients died before any procedures. (Two males and seven females, mean age was 32 (14-39)). All nine of them were HIV positive. Five patients required emergency laparotomy (three for bowel obstruction and two for peritonitis). Four males and one female, mean age was 34.2 (23-41), three patients were HIV positive and two were unknown and refused to test. All five patients had positive histology for TB. Ten patients went for diagnostic laparoscopy. Six males and four females mean age was 37.4 (23-73). Two patients were HIV negative, two were unknown and six were positive. All patients underwent U/S abdomen and nine patients had a CT abdomen. One patient was found to have appendicitis. In all others there was macroscopic evidence of chronic inflammation. Only three patients had positive histology for TB. Four patients had evidence of chronic inflammation on histology. The histology in the remaining two was normal. There was no major complications post procedure. One patient died nine days after the laparoscopy.
**CONCLUSION:** Laparotomy remains an effective way of definitively diagnosing TB abdomen. Our experience with laparosoopy is small. Laparoscopy is useful to diagnose alternate surgical pathologies that need treatment. Histology confirmed the presence of TB in a third of cases. The presence of chronic inflammation without evidence of TB bacilli is confusing.

## DOUBLE JEOPARDY REVISITED

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**INTRODUCTION:** Correct management decisions are vital in trauma and may need to be made urgently but with limited information. In the setting of hypovolaemia from massive bleeding and potential injuries in two body cavities deciding which cavity contains the source of hemorrhage may not be easy. This situation has been described as one of double jeopardy.
**METHODOLOGY:** A prospective trauma database is maintained by the general surgical service of the Pietermaritzburg metropolitan complex. All patients who presented major dilemmas in terms of the site of hemorrhage (chest or abdomen) or the sequencing of operation (thoracotomy or laparotomy) are included in this review.
**RESULTS:** We identified seven patients who had presented significant dilemmas to the managing team. There were six males. The age range was typical of trauma 19-35. The mechanism of injury was gunshot wound (3), stab wound (3) and blunt trauma (1). The major source of hemorrhage was liver (3), cardiac (2), internal mammary artery (1), lung (1). In four the incorrect body cavity, and in one the correct body cavity was opened initially. In two patients thoracotomy was performed as a resuscitative maneuver prior to laparotomy. There were four survivors. All deaths occurred in the operating theatre.
**CONCLUSION:** In the critically unstable trauma patient with potential injuries in both the chest and the abdomen decision making can be difficult. The outcome is often poor. Profound hypovolaemic shock in the presence of a penetrating stab wound to the chest should prompt a thoracotomy. The injury is likely to be significant but easily manageable. In the case of major blunt trauma or a trans-axial or trans-thoracic trajectory of a gunshot wound then the significant injury is more likely to be in the abdomen. This should be opened primarily unless resuscitative thoracotomy with cross clamping of the aorta is contemplated.

## EVISCERATION FOLLOWING ABDOMINAL STAB WOUNDS: AN ANALYSIS OF 66 CASES

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**BACKGROUND:** To determine the incidence of intra-abdominal injury requiring laparotomy after an abdominal stab wound with evisceration.
**METHODS:** Data was collected retrospectively over a 3-year (Jan '05-Dec '07) period on all patients who presented to our level I-type trauma center with an abdominal stab wound and evisceration. This information included which organ eviscerated, presence of other indications for laparotomy, organs injured, and postoperative complications. Injury severity was categorised using the revised trauma score (RTS), injury severity score (ISS) and penetrating abdominal index (PATI).
**RESULTS:** A total of 379 patients with abdominal stab wounds were admitted. Of these, there were 66 (17.4%) with evisceration: organ evisceration 35 (53%) and 31 (47%) with omentum evisceration. Organ evisceration was as follows: small bowel 27 (40.9%), stomach 2 (3%) with, colon (1), small bowel and stomach (2) and small bowel and colon in three patients. Mean RTS, ISS and PATI scores were 7.71, 13.74 and 8.26 respectively. All patients with organ evisceration underwent mandatory laparotomy with only 2 (5.7%) undergoing a negative laparotomy. Twenty –two patients with omentum evisceration presented with signs of peritonism and underwent a therapeutic laparotomy. Nine patients with omentum evisceration were managed successfully nonoperatively. Overall, 56 patients (84.5%) had an intra-abdominal injury that required repair.
**CONCLUSION:** The majority of patients who present with an evisceration after a stab wound to the abdomen require a laparotomy. Evisceration should continue to prompt operative intervention. An exception can be made to a selective few patients with omentum evisceration with benign abdominal clinical signs.

## LAPAROSCOPIC ASSESSMENT OF LEFT UPPER QUADRANT STAB WOUNDS

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**INTRODUCTION:** The clinical evaluation of left sided thoraco-abdominal stab wounds is challenging. Clinical signs of visceral or diaphragmatic perforation may be completely absent or manifest late. There is potential for error and missed injury. Laparoscopy enables direct inspection of structures in the left upper quadrant. This study investigates laparoscopy in patients without an absolute indication for exploration and with a penetrating left sided thoraco-abdominal stab wound.
**MATERIALS AND METHODS:** A collaborative prospective audit was performed at Addington Hospital, Durban and the Pietermatritzburg Hospital complex between June 2006 and April 2008. Patients with left upper quadrant stab wounds extending between the fifth intercostal space to the inferior extent of the thorax, and between the posterior axillary line and the midline and without an absolute indication for surgical exploration, were included. . Patients were subjected to laparoscopy under general anaesthetic. At laparoscopy the operating surgeon looked for peritoneal breech, and the presence of enteric contents or blood. Once an injury was confirmed operative management was individualized according to surgical preference.
**RESULTS:** A total number of 26 patients were identified. Twenty patients had non-peritonitic abdomens and 6 patients had equivocal findings on abdominal examination. Diaphragmatic injuries were found in 10 patients with soft abdomens of which one had an associated stomach perforation. The remainder had breech of the peritoneal cavity but no visceral or diaphragmatic injury. Of the 6 patients with equivocal abdominal findings, three had a haemoperitoneum and three a diaphragmatic injury with an associated stomach perforation. All diaphragmatic injuries were repaired either open (3) or laparoscopically(7). There were two splenic injuries which were managed conservatively and the stomach perforations were laparoscopically repaired. No patients required high care or ICU and there were no mortalities. A single patient developed an empyema in the group with gastric perforations.
**CONCLUSION:** Laparoscopy has a high yield in patients with penetrating stab wounds in the left upper quadrant. It allows for easy diagnosis of diaphragmatic injuries requiring repair. Depending on surgical expertise it may allow for laparoscopic repair of diaphragmatic injury. In patients with equivocal abdominal findings it distinguishes visceral perforation from simple peritoneal breech and allows one to avoid non-therapeutic laparotomy. Laparoscopic investigation of patients with penetrating left sided thoraco-abdominal stab wounds needs to be investigated further to define its role in algorithims for the assessment of trauma.

## PENETRATING TRAUMA TO THE BACK: DO WE NEED RADIOLOGICAL INVESTIGATIONS?

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**OBJECTIVE:** We set out to audit our trauma unit's management of penetrating trauma to the back. The results of the audit, together with a review of the literature, were then used to rationalize a management protocol.
**SETTING:** Level-1 university affiliated trauma center.

**PATIENTS AND METHODS:** A retrospective review of all patients with penetrating trauma to the back was performed from April 2008 to January 2007. The back was defined as the area between the tips of the scapulae to the iliac crests ,and both midaxillary lines. Penetrating injury was defined as an injury that breached the fascial layer. Patient's trauma admission sheets were analysed for time from injury to presentation, vitals signs on arrival, clinical examination, radiological investigations and final outcome.
**RESULTS:** Ninety nine patients (90 males, 9 females; median age of 25 ,range 4-49 years old) were treated for penetrating injuries of the back during the audit period. The weapon used was a gun in 8 patients, and a knife in 91 cases, with 12 patients having multiple penetrating injuries to the back. The median time of injury to presentation at the trauma unit was 55 minutes (range 20-1320 minutes).
Erect chest x-rays were performed in 94 patients, 2 patients had air under diaphragm. Both went for laparotomy. One patient had small bowel and colon injuries, the other a colonic injury. The remaining 92 had normal erect chest x-ray's. 36 FAST scans were done, 3 revealed free fluid in the peritoneal cavity. All 3 patients went on to have CT scans, and were consequently managed conservatively. 37 patients underwent CT scan investigation, 34 had triple contrast, 2 had double contrast (enema's) and 1 had a double contrast (meal). Abnormalities were detected on 12 scans, and 3 resulted in a laparotomy.
Haematuria was present in 14 patients (4 macroscopic, 9 microscopic, one false positive) Following contrast CT scan, 12 of these patients had renal injuries, none of which required surgical intervention. One patient with macroscopic haematuria was unstable (GSW back) and went to theatre immediately undergoing nephrectomy for grade IV vascular injury.
A total 24 patients underwent a laparotomy, 4 were negative and 5 were non-therapeutic. Of the negative laparotomies one was as a result of a false positive diagnostic peritoneal lavage with no further investigation. The remaining 3 were taken by the same surgeon to theatre with no clear indication, and no radiological investigations. Of the non-therapeutic laparotomies 2 followed triple contrast CT scan, one patient had a retroperitoneal haematoma, the other a grade I liver and grade I splenic injury. The other 3 patients were taken to theatre because of tender abdomens, with no CT scan investigation. One had a splenic grade I injury, one had liver grade II injury and the last had a retroperitoneal haematoma. Of note is that there were 5 patients that had colonic injuries, none of which had undergone a CT scan as they all had peritonitic abdomens on first examination.
**CONCLUSION:** Penetrating trauma to the back can be managed clinically with serial examinations if examined by an experienced surgeon. Erect chest x-rays and FAST scans are of little use in this population. In the subgroup of patients with abdominal tenderness, but no guarding, an intravenous contrast CT scan should be performed. Enteric contrast adds no additional benefit to the CT study. A CT IVP should be performed in those patients with gross haematuria, or who present with shock and microscopic haematuria.

## SELECTIVE NONOPERATIVE MANAGEMENT OF ABDOMINAL GUNSHOT WOUNDS: A COST ANALYSIS

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**BACKGROUND:** Selective non-operative management (SNOM) of abdominal gunshot wounds is a practice that is becoming more common in major urban trauma centres.
**PATIENTS AND METHODS:** This is retrospective cohort study of 257 consecutive patients admitted to a level I trauma centre in South Africa for the management of abdominal gunshot wounds over a one year period from 1 April 2004 to 31 March 2005. Demographic information and clinical data captured on the trauma admission form were collected for statistical analysis. Outcomes of interest included abdominal organs injured, mortality within 24 hours of admission, mortality within 1 week of admission, and overall mortality during hospital admission. A cost analysis was also performed based on 1) length of hospital stay, 2) procedures received, 3) imaging procedures conducted, and 4) blood products consumed. These costs were based on the Uniform Patient Fee Schedule For Paying Patients Attending Public Hospitals (NDOH, 2004; NDOH, 2006) assuming private patient costs.
**RESULTS:** Ninety-three of 257 (36%) of abdominal gunshot wound victims were nonoperatively managed. Of these 93 patients, 5 (5%) required delayed laparotomy. Of the 164 patients who were treated with immediate laparotomy, 10 (6%) underwent non-therapeutic laparotomies. The median injury ISS was 4 for patients who were non-operatively managed versus 10 for patients who were surgically managed ($p$<0.001). SNOM patients had a decreased median length of hospital stay, 3.2 versus 7.2 hospital days ($p$<0.001). SNOM was associated with lower overall median hospital costs at 6,225 ZAR versus 13,768 ZAR ($p$<0.001). In addition, there were no deaths within the cohort of patients that were managed non-operatively during the hospital stay, compared to 9 deaths in the group of surgically managed patients ($p$=0.03). SNOM patients had 84% lower odds of having a high hospital cost compared to patients who had an immediate laparotomy (OR 0.16, 95% CI 0.09-0.28). This association was not statistically significant after adjusting for ISS, the presence of an acute abdomen, and the haemoglobin level (HR 0.40, 95% CI 0.15-1.08).
**CONCLUSION:** SNOM can be successfully used in tertiary prevention of violence by non-operatively management of less severely injured abdominal gunshot wounds. The use of SNOM does not increase morbidity or mortality rates but is associated with decreased length of hospital stay and overall lower hospital costs.

## THE SPECTRUM OF DIAPHRAGMATIC INJURY AT A BUSY SURGICAL SERVICE

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**INTRODUCTION:** The diaphragm may be injured by penetrating or blunt trauma. If not recognized and dealt with there is a significant risk of serious late morbidity. However it may be difficult to make the diagnosis of diaphragmatic breech. This prospective study reviews our experience with diaphragmatic injury in a busy general surgical service with a heavy trauma burden.
**METHODOLOGY:** A prospective trauma database is maintained by the general surgical service of the Pietermaritzburg metropolitan complex. All patients who sustained a diaphragmatic injury between September 2006 and Sept 2007 were included in this study.
**RESULTS:** A total of 37 patients had diaphragmatic breech confirmed at laparotomy or laparoscopy. The average age was 29 years. The mechanism of injury was stab (24) gunshot wound (10) shotgun (1) and blunt trauma (2). There were seven deaths in this group. Four patients required a subsequent thoracotomy to deal with lung sepsis and two patients required a thoracoscopy to deal with residual collections. A total of five diaphragmatic injuries were diagnosed at laparoscopy. The indication for laparoscopy was proximity stab with a soft abdomen in all cases. Of these injuries four were repaired at open technique and one was repaired laparoscopically. A total of nine patients presented with an acute diaphragmatic hernia. The average age was 29. The mechanism of injury was stab (5) gunshot (1) and blunt trauma (3) . The hernia contents were colon(1), stomach (7) spleen (1). The operative approach was a laparotomy (8) and a thoracolaparotomy (1). A single patient required re-operation as his repair broke down and he re herniated. In three cases there had been inappropriate cannulation of the left chest. There were two gastric perforations caused by chest drain placement and the third drain had passed through the diaphragmatic defect into the abdominal cavity. One of these patients required a delayed thoracotomy to deal with chronic pulmonary sepsis. A total of six patients presented with a chronic diaphragmatic hernia of longer than six months duration. The average age was 29.9. the mechanism of injury was stab (4) blunt trauma (2) and gunshot wound (1). The average delay from injury to presentation was 3.5 years. The contents were colon (3) and stomach (3). All were dealt with by laparotomy.
**CONCLUSION:** AT laparotomy diaphragmatic breech is usually recognized and dealt with appropriately. Failure to follow principles may result in a diaphragmatic injury being overlooked. Isolated diaphragmatic injury without associated visceral injury cannot be diagnosed clinically or radiologically. Direct video-endoscopic inspection of the diaphragm is indicated for all patients with penetrating trauma to the left upper quadrant who do not have an indication for operation. The presentation of diaphragmatic herniation can be acutely after trauma or delayed. Most diaphragmatic hernias can be dealt with via a transabdominal route.

## MORPHOLOGICAL CHANGES ASSOCIATED WITH REGENERATION OF RENAL TUBULES AFTER ISCHAEMIC INJURY

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**AIM:** Ischaemia of the kidney results in acute tubular necrosis and subsequent regeneration of the renal tubules. The time-course of the regenerative response is poorly documented. The aim of this study was to evaluate the morphological changes associated with regeneration of the renal tubules after an ischaemic injury.
**METHOD:** Long Evans rats weighing 250-300g were subjected to a midline laparotomy and mobilization of right kidney. The right renal artery and vein were clamped for 90 minutes. Groups of animals were sacrificed at 0, 24, 48, 72 and 96 hours postoperatively. Blood was taken for renal function tests and both kidneys removed for histological examination (mitotic index, PCNA, Ki protein).
**RESULT:** There was a 50-80% increase in serum urea and creatinine at 24 hours followed by a steady decline to normal levels by 96 hours. There was a significant increase in the mitotic index in the right kidney from 0 mitoses/hpf at 0, 6 and 12 hours to 22 mitoses/hpf at 48 hours. Thereafter the mitotic index decreased and almost reached baseline levels by 96 hours (2 mitoses/hpf). Interestingly there was a small increase in the mitotic index in the left kidney at 48 and 72 hours (2 mitoses/hpf).
**CONCLUSION:** These studies show that the regenerative response starts at 24 hours after an ischaemic injury, reaches a peak at about 48 hours, and is almost complete by 96 hours.

## EFFECT OF ERADICATION OF *HELICOBACTER PYLORI* ON BLOOD PRESSURE IN BLACK SOUTH AFRICANS WITH HYPERTENSION

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**BACKGROUND:** The Medical Research Council has estimated that direct cost of treating high blood pressure (hypertension) is $20 000 000/annum. Hypertension is the leading cause of stroke, kidney and heart failure as well as other related cardiovascular illness (e.g. atherosclerosis). For an as yet unexplained reason more individuals of African ancestry are affected by hypertension and have more severe disease (hypertension related kidney disease, stroke, etc.). A possible explanation is the bacterium *Helicobacter pylori* (which is endemic in the Black South African community) is playing a causal role in the pathogenesis of hypertension in these patients. It is known to interfere with vitamin $B_{12}$ absorption (a determinant of homocysteine (tHcy) concentrations) and deplete L-arginine (the nitric oxide precursor). It has not been determined if eradication of *H pylori* would decrease blood pressure in black South African patients with hypertension.
**METHODS:** Consenting adult Black South Africans (n=37) with active *H pylori* (by $^{14}$C-urea breath test; $^{14}$C-UBT) and mean awake ambulatory blood pressure (ABPM) SBP 140-159mm Hg and/or DBP 85-99mm Hg were randomized to quadruple therapy (n=22) or placebo (n=15). Patients were follow-up for 8 weeks after treatment, measuring blood pressure and blood chemistries. Eradication was confirmed at the 8 week visit by the breath test. Amino acids in blood samples from the fasted patients were analysed by HPLC/MS.
**RESULTS:** Overall, eight weeks after completion of treatment, BP's of patients treated with optimal quadruple therapy to eradicate *H pylori* were not different to patients taking placebo. However, a) successful eradication of *H pylori* resulted in mean awake SBP/DBP decrease of -5.4mm/-3.4mm respectively whereas sleeping BP was essentially unchanged (+1.2mm Hg/-0.9mm Hg respectively); b) eradication rate using recommended quadruple therapy was 50%, much less than reported studies conducted elsewhere; c) arginine concentrations were elevated in patients with hypertension and correlated positively with both blood pressure and plasma proline concentrations.
**DISCUSSION:** The BP decrease was apparent in patients who were successfully eradicated in keeping with results of one other study. The 50% eradication rate was unexpected requiring the sample size to be increased to confirm the results. Our finding that arginine concentrations were elevated in patients with hypertension and positively correlate with blood pressure is consistent with reports in the literature. The strong correlation of the arginine precursor, proline with arginine may suggest that *de novo* synthesis of arginine from proline occurs.
**CONCLUSIONS:** The study implicates *H pylori* in the pathogenesis of hypertension. The 50% eradication rate requires the sample size needs to be increased confirm the results. Arginine concentrations were elevated in hypertension and may be synthesized from the precursor, proline.

## A COMPARISON OF RESPIRATORY MUCINS IN ASTHMA AND COPD

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**INTRODUCTION:** Airway mucus hypersecretion is the main cause of mortality and morbidity in respiratory diseases such as asthma and chronic obstructive pulmonary disease (COPD) and is the leading cause of death in South Africa. Mucus is a viscid, slimy viscoelastic gel-like material which coats the epithelial tissue of gastrointestinal, reproductive and respiratory tracts. Mucus has defined rheological properties that enable it to be transported out of the lungs by mucociliary clearance. Mucins are high molecular-weight, heavily O-glycosylated glycoproteins that compromise approximately 2% of mucus and cause the mucus to be thick and tenacious. Mucins are divided into three broad categories namely, secreted gel-forming, secreted non gel-forming and membrane bound.
**METHODS:** Sputum samples were collected in 6M GuHCl containing protease inhibitors from patients with asthma and COPD from hospitals around Cape Town. Mucins were purified using CsCl density gradient ultracentrifugation and identified by western blot analysis using MUC antibodies to specific mucins in the respiratory tract. Ion-exchange chromatography was used to separate the mucins based on their charge and used to detect whether there are different glycoforms present between mucins.
**RESULTS:** Mucins eluted at a density of 1.39 – 1.40g/ml in CsCl density gradient ultracentrifugation. Mucins eluted as a broad peak from the MonoQ 5/50GL column. The PAS positive fractions were further examined for the presence of the MUC5AC, MUC5B and MUC2. MUC5AC and MUC5B were found in both asthma and COPD. However MUC2, a mucin that only presents in the disease state was found in asthma and in COPD. The presence of MUC2 in asthma over and above MUC5AC and MUC5B (all 3 are secreted gel-forming mucins) could change the rheological properties of the mucus gel in the airways resulting in an even more tenacious secretion that aggravates the disease. The fact that MUC2 is found in asthma and COPD shows that these diseases has progressed and is very severe.
**CONCLUSION:** The presence of MUC2, a gel-forming mucin, in airway disease could explain the tenacity of the mucus in these conditions.

## ARGININE UPTAKE BY HUMAN ENDOTHELIAL CELLS

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**INTRODUCTION.** Total homocysteine (tHcy; -SH) concentrations are a risk factor for cardiovascular disease (MI, stroke, hypertension) but recent large studies have failed to show benefit of homocysteine reduction on CV endpoints.
Arginine is a semi-essential amino acid required in a variety of biological processes including protein synthesis and creatinine production. It is also the precursor of nitric oxide (NO), the molecule mediating arterial vasodilation and immune defence. It plays a role in promoting recovery in trauma patients and promotes wound healing.
Although arginine and homocystine (-S-S-) share a common transporter, the kinetics of this interaction has not been studied. We hypothesize that arginine is the risk factor for CV disease and tHcy is a surrogate marker of insufficient arginine concentrations.
**Aims.** To determine the effect of homocystine on arginine uptake in transformed endothelial cells.
**Methods.** 400,000 $ECV_{304}$ cells were grown to confluence in 6 well culture plates. The cells were washed with PBS and growth medium replaced with arginine-free medium and incubated for 24 hours. The medium was removed and incubated with saline buffer containing labelled arginine with/without unlabelled arginine and homocystine for 30 sec. The reaction was stopped and $^3$H-arginine uptake by the cells determined using a ß-scintillation counter.
**Results.** At low concentrations of homocystine uptake of arginine was inhibited. The affinity for arginine remained essentially unchanged, except at low homocystine concentrations (<8-12.5µmol/L). At higher homocystine concentrations and low arginine concentrations (≤100µmol/L) inhibition was typical of competitive inhibition (calculated $K_m$'s were similar). At arginine concentrations >100µmol/L, arginine uptake was increased but the affinity for arginine decreased (greater $K_m$). The kinetics of arginine uptake in the presence of high homocystine (>25µmol/L) appears complex.

| | [Homocystine] (µmol/L) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Low arginine (≤100µmol/L) | 0 | 2.5 | 5 | 8 | 12.5 | 18 | 25 | 35 | 50 |
| Vm (Vi) (x10$^6$) | 19.3 ±0.4 | 12.9 ±0.1 | 10.1 ±0.8 | 7.1 ±2.2 | 6.1 ±0.4 | 8.3 ±0.9 | 12.1 ±2.4 | 13.6 ±4.2 | 11.1 ±0.8 |
| Kd | 25.1 ±1.7 | 21.3 ±4.0 | 15.1 ±3.1 | 27.5 ±0.3 | 23.5 ±0.1 | 24.4 ±3.0 | 37.2 ±14.7 | 17.0 ±8.2 | 32.3 ±2.4 |
| High arginine (≥100µmol/L) | | | | | | | | | |
| Vm (Vi) (x10$^6$) | 37.5 | 35.7 | 36.2 | 33.8 | *51.6* | 37.6 | 32.3 | *56.9* | 44.1 |
| Kd | 127.6 | 112.9 | 117.9 | 108.3 | *407.3* | 144.7 | 121.0 | *293.5* | 155.7 |

**Conclusions.**
Homocystine competed for uptake of L-arginine and this appears to be mediated by more than one transporter as demonstrated by the kinetics changing depending on concentration of arginine used in the uptake studies. The study may have implications in cardiovascular, infectious disease and in ischemia.

## EFFECT OF ANTI-HYPERTENSIVE DRUGS ON Y+L-ARGININE TRANSPORT

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**INTRODUCTION:** Arginine plays a central role in protein and nitrogen metabolism. As the nitric oxide precursor, arginine's role and benefit in physiological processes (cell-cell signaling, vasodilation, wound healing, angiogenesis, immune function) appears to have been underestimated and not fully elucidated. Angiotensin-converting enzyme inhibitors (AECIs) are well known drugs used in the treatment of cardiovascular (CV) diseases. Unlike other antihypertensive agents they confer additional target organ protection over and above the blood pressure lowering benefit. Indeed, the treatment of hypertensive patients with ACEIs results in the recovery of the renal endothelial responses to exogenous L-arginine administration; whereas no responses to L-arginine were observed in patients treated with non-ACEI agents. Nevertheless, the mechanisms of the beneficial effects of ACEIs on endothelial responses to exogenous L-arginine administration have not been elucidated. Bearing in mind the reduced responses to arginine observed in patients with certain CV diseases, we have been studying factors affecting arginine uptake by endothelial cells and noted arginine uptake by two distinct transporters. We hypothesized that AECIs may produce their beneficial effects by enhancing arginine uptake into endothelial cells by these transporters.
**AIM:** To determine the effect of ACEIs and other classes of antihypertensive agents on initial rate kinetics of arginine uptake by $ECV_{304}$ endothelial cells.
**METHODS:** 400,000 Cells were plated out per well of 6 well cell culture plates in complete growth medium. After 24 hours incubation at 37°C with 5% $CO_2$, the cells were washed with PBS and medium was changed to test medium containing no arginine. After another 24 hour incubation period, the cells were washed again. Cells were then exposed to PBS containing various drug concentrations between 2.5 and 100µmol/L with arginine (0-100 µmol/L) and trace radiolabelled $^3$H-L-arginine. The uptake of arginine label into the cells was measured after 30 seconds using a scintillation counter. Affinity rate constants were calculated from intercepts of Lineweaver-Burk plots (1/[arginine] vs 1/(rate of uptake)).
**RESULTS:**
Effect of cardiovascular drugs on affinity of arginine transport by the high affinity y+L transporter
[1]Only data for representative drug concentrations (conc.) of 2.5 and 33µmol/L are shown (5, 15, 67 and 100 µmol/L not shown).
[2]Linear change in transporter affinity (Km) was calculated with all drug concentrations from 2.5 - 100 µmol/L (as noted above[1]).
Increasing enalapril concentrations increased the affinity (lower Km) of arginine transport using the y+L transporter. The change with losartan and HCTZ were of borderline significance with an increase in Km observed with HCTZ at 100µmol/L. Atenolol and nifedipine were without effect.
**Conclusions.** Enalapril changed the affinity of arginine uptake by $ECV_{304}$ cells whereas other commonly used classes of cardiovascular drugs were either of borderline significance or had no effect.

## PROTEOMIC ANALYSIS OF THE $M_R$ ~ 40-50 K GLYCOPROTEIN ISOLATED FROM PURIFIED GASTRIC CANCER MUCIN SHOWS IT TO BE ALPHA-1-ACID GLYCOPROTEIN (OROSOMUCOID)

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**BACKGROUND**: In our previous biochemical and immunohistochemical studies for the expression of the $M_r$ ~ 40-50K glycoprotein we demonstrated that normal mucosa showed a pattern of parietal cell expression, whereas intestinal metaplasia and gastric carcinoma showed a pattern of columnar cell and gastric cancer cell expression respectively.
**AIM**: The aim of this study was to generate a 2D proteome map of the $M_r$ ~ 40-50K glycoprotein shown to associate with gastric cancer mucin and to identify it using MALDI-TOF mass spectrometry.
**METHODS**: Gastric mucins were isolated from crude mucus scrapings obtained from gastrectomy specimens resected for carcinoma. Mucins were purified by density gradient ultra-centrifugation in CsCl and analyzed by isoelectric focusing (IEF) on 2D-polyacrylamide gels. Gels were stained with Coomassie Brilliant blue and Periodic Acid Schiffs base. Identification was by MALDI-TOF MS.
**RESULTS**: In 2D-PAGE stained with coomassie blue, three spots (with different staining intensity) corresponding to the $M_r$ ~ 40-50K glycoprotein were resolved. The 2D-PAGE stained with PAS gel revealed a single strong PAS spot. The three spots resolved in the coomassie stained 2D-PAGE were identified as human orosomucoid 1 (ORM1), also known as alpha 1 - acid glycoprotein (AGP1) while the PAS positive spot could not be identified.
**CONCLUSION**: We successfully used proteomics as an approach to provide advances in the analysis of the $M_r$ ~ 40-50K glycoprotein. Orosomucoid 1, a glycoprotein known to suppress the immune system, is found with the mucin component in crude mucus of gastric scrapings of patients with carcinoma of the stomach, and is also expressed by parietal cells in normal tissue.

## PARTIAL PURIFICATION OF A CHROMIUM CONTAINING COMPOUND FROM THE LIVER

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**INTRODUCTION:** Studies have shown that chromium is an essential trace element that binds insulin to stabilize blood sugar levels and plays a role in protein, carbohydrate and lipid metabolism. The chromium containing 'glucose tolerance factor' partially isolated from yeast was originally described in 1953 and a low molecular weight molecule, chromomodulin has since been isolated from the liver and has been found in urine. The reported isolation procedure involves adding oxidizing $Cr^{6+}$ to liver followed by chromatographic separation techniques. However, techniques involving this powerful oxidant are unlikely to result in the isolation of a biologically relevant molecule. Further, our preliminary results, using the addition of $Cr^{3+}$, showed the Cr-associated fraction to be soluble in detergents, i.e., suggesting a membrane bound molecule. In view of the importance of stabilizing glucose in surgical interventions, trauma and other diseases, we attempted to isolate a chromium containing molecule from liver.
**METHODS:** Calf or pig liver was diced and homogenized in a Waring blender together with saline and $Cr^{3+}$ as chromium acetoacetonate with $^{51}$Cr-EDTA (±150µCi; 1ml) as tracer to follow Cr-incorporation into protein. The homogenate was centrifuged to remove cell debris. Incremental amounts of polyethylene glycol (PEG) solution were added to the supernatant to precipitate protein. The protein was solubilised in TAE buffer and both protein (Lowry method) and radioactivity determined. The protein was also separated by polyacrylamide gel electrophoresis (PAGE) on 7.5% and 17.5% crosslinked gels.
**RESULTS:** On 17.5% crosslinked gels radioactivity was found in high molecular weight protein precipitated at >21% (w/v; PEG) and with lower molecular weight protein precipitating at less than 10% (w/v; PEG). The results were confirmed on the 7.5% crosslinked gels.
**DISCUSSION:**The method used differed from reported isolation techniques in that a) $Cr^{3+}$ was added to the liver homogenate instead of oxidizing $Cr^{6+}$; b) a radioactive tracer was added to follow incorporation of Cr into proteins; c) PEG was used to precipitate protein and which is commonly used to isolate membrane bound proteins.
**CONCLUSIONS:** The results contrast a number of reported studies as Cr incorporation was associated with a high molecular weight fraction protein which may be membrane bound. The possibility that Cr is loosely bound to protein, as opposed to incorporated (complexed) to protein needs to be excluded.

## NPWT 2: PERFUSION BENEATH CIRCUMFERENTIAL NPWT IN HUMANS

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**AIMS:** A previous study demonstrated that negative pressure wound therapy (NPWT) increased tissue pressure. This conflicts with the understanding that these dressings increase perfusion. This study investigated the effects that circumferential NPWT has on perfusion in humans and how different suction pressures influence this.
**METHODS:** Ten healthy volunteers were recruited into the study and sequentially randomised to receive suction pressures of either -400 mmHg or -125 mmHg. With both hands placed in circumferential NPWT dressings, suction was only applied to one hand. Perfusion of both hands was then analysed simultaneously using radio-isotope perfusion imaging. After allowing one week for complete excretion and decay of the isotope, an identical experiment was done on the same volunteers', this time using the contralateral hand as the test hand. A total of 20 scans were carried out. Data were analysed using repeated measures of ANOVA.
**RESULTS:** In the hands that received suction pressures of -400 mmHg, there was a highly significant mean reduction in perfusion of 40% (SD 11.5%, p<0.0005). In the hands that received suction pressures of -125 mmHg there was also a highly significant mean reduction in perfusion (mean 17%, SD 8.9%, p<0.0005). The reduction in perfusion of the group undergoing NPWT at -400 mmHg was significantly greater than the group undergoing NPWT at -125 mmHg (p<0.0005).
**CONCLUSION:** Tissue perfusion beneath circumferential NPWT dressings is significantly reduced when suction is applied, regardless of whether suction pressures of -125 mmHg or -400 mmHg are utilised. There is a significantly greater reduction in perfusion at suction pressures of -400 mmHg, compared to -125 mmHg. This implies that circumferential NPWT should be used with extreme caution, if at all, on tissues with compromised perfusion. This finding represents a paradigm shift in our understanding of the mechanism of action of NPWT.

## NON HEART BEATING ORGAN DONATION AT GROOTE SCHUUR HOSPITAL

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**BACKGROUND**: A non heart beating kidney donation programme was started in January 2006 at Groote Schuur Hospital. The current head injury policy is to withdraw treatment in patients with irreversible brain damage and a Glasgow Coma Scale under 5T. The objective of the non heart beating policy is to address this group of patients as potential donors.
**METHOD**: After consent is given for organ donation, the patient is extubated while the surgeon who will do the procurement stands ready in theatre. If the patient has a cardiac arrest within a 2 hour time span, the patient is taken to theatre immediately after death and the organs are retrieved. If the patient does not arrest in that time span, the procedure is abandoned. After procurement the cold ischaemic time is kept as short as possible. Recipients with no previous transplants and low antibody status are used. Initially standard immunosuppression with Cyclosporin, Azathioprine and Medrol was used from day 1. Subsequently the policy in the unit has changed and Simulect induction therapy is now being used, with Cyclosporin started on day 3-5.
**RESULTS**: In the time period between January 2006 and December 2007, 7 referrals for non heartbeating kidney donation were made to the Transplant Coordinators at Groote Schuur Hospital. All the donors were male patients with an average age of 31. The cause of death was gunshot wounds in 3 cases, a stab wound in 1 case, suicide in 1 case and motor vehicle accidents in 2 cases. Consent for donation was given in 6 cases. Of the 6 cases, 2 did not arrest in the 2 hour time span; 1 patient had an unexpected cardiac arrest before extubation, but was successfully procured in theatre within 30 minutes; and 3 patients arrested within the 2 hour period after extubation.
**CONCLUSION**:
Of the 8 kidneys harvested, 2 kidneys could not be used because they were from a AB-blood group donor and there were no suitable recipients available. Six kidneys were transplanted with an average cold ischaemic time of 12 hours. Five patients required dialysis in the first week, 4 in the second week, 2 in the third week and none in the fourth week post transplantation. Renograms were done on 5 patients in the first week, 2 in the second week and 2 in the third week. Four of the patients required a biopsy in week 2 or 3 and 2 of these patients had subsequent treatment with pulsed Medrol. One patient had a wound infection as well as a post-operative Klebsiella pneumonia. Four patients were discharged on day 17, one on day 31 and one on day 63 after severe complications with sepsis and pneumonia. All patients had functioning grafts on discharge.

## UTRASTRUCTURAL CHANGES IN PLATELET AGGREGATES OF HIV PATIENTS: A SCANNING ELECTRON MICROSCOPY STUDY

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**INTRODUCTION**: Thrombocytopaenia which occurs in about 40% of patients with HIV infection may be caused by increased peripheral platelet destruction, a defect in platelet production or a combination of these.
**AIM**: The aim of this study was to compare the morphology of the fibrin-bound platelet aggregates in platelet rich plasma (PRP) clots prepared from HIV patients with those of controls. The platelet aggregates were studied using a Zeiss Ultra 55 FEG scanning electron microscope.
**RESULTS AND CONCLUSIONS**: The ultra structural changes seen in the HIV infected patients vis-à-vis the shriveled platelet aggregates with the bleb-like protrusions resulting from damaged organelles bulging through a disrupted membrane, are reminiscent of the apoptotic changes or programmed cell death as described by Wyllie et al.(1) Further research on the effect of the virus on typical apoptotic proteins in activated platelets is suggested as this qualitative study only shows changes in ultra structure. However the shrunken, shriveled apoptotic appearance of the fibrin-bound platelet aggregates, as seen with scanning electron microscopy, seems to provide further evidence of the devastating cyto-destructive effects of HIV disease.

## THE RELATIONSHIP BETWEEN HIV STAGE, HAART, NUTRITIONAL STATUS AND OUTCOME

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**INTRODUCTION:** The interrelationship between HIV stage, nutritional status, HAART and outcome in a high prevalence South African cohort is poorly defined. Assessment of this relationship was undertaken.
**MATERIALS AND METHODS:** An observational cohort study over a 16 month period on ART naïve patients over 18 years of age was performed. Consenting patients attending the HIV/HAART clinic had a nutritional assessment performed. This consisted of anthropometric assessment. BMI, mid upper arm circumference (MAC) ,waist hip girth ratio and a bio-impedance assessment of body composition. All measurements were performed by the principal investigator. Albumin levels, CD4 count and viral load were measured. Follow-up was performed with an interval from 3 months to 1 year. Anti-retroviral therapy was started when the CD4 count was < 220 cells/mm$^3$
**RESULTS:** Of 125 recruited patients 90 were females and 35 male. Median age 35 years (Range 20-58). 119 were African, 4 were Coloured and 2 were Asian. The mean CD4 count was 205 cells/mm$^3$ with a median of a 145 cells/mm$^3$. 63% had a CD4 count of less than 220 cells/mm$^3$. The mean albumin level was 32 g/dl. In the group of CD4 < 220 albumin was 30.3 g/dl and the group above 220 was 34.7 g/dl (p=0.01). The mean BMI was 24.9. (range 13.4 - 50.4).
In patients with a CD4 counts of <220 cells/mm$^3$ had a mean BMI of 23.4 and those with a CD4 count of >220 cells/mm$^3$ had a mean BMI of 28.2 (p=0.01). Body composition bio-impedance and anthropometric measurements demonstrated similar findings except for lean body mass. Thirty five patients were followed-up. Over time the following parameters improved: BMI (p=0.008), CD4(p=0.051), albumin (p=0.028), waist (0.02), hip(p=0.005) and MAC(p=0.008) dry lean mass(p=0.08). Deaths were recorded in 6 patients (4.8%) mean BMI albumin and CD4 of 18, 25g/dl 74 cells/mm$^3$ compared to survivors mean BMI, albumin and CD4 of 24, 32 g/dl 212 cells/mm$^3$.
**CONCLUSION:** The CD4 count correlates best with albumin and BMI. HAART produces improvement in overall markers of nutritional status but not lean body mass. Deaths occurred in those both severely malnourished and with profoundly low CD4 counts.

## USE OF MUSCLE STRENGTH ASSESSMENT AS A PREDICTOR OF SUCCESSFUL EXTUBATION IN VENTILATED ICU PATIENTS

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**INTRODUCTION:** Rapid shallow breathing index (RSBI) and PaO2/FiO2 ratio ( P/F) are two commonly used parameters to evaluate patients for extubation. However, they do not always predict successful extubation. We want to evaluate muscle strength assessment as an additional measure to improve success rate of extubation in ICU.

**AIM:** To assess whether muscle strength testing with RSBI and PaO2/FiO2 provide improved prediction for successful extubation in ICU patients.
**METHOD:** Prospective cohort study of ventilated ICU patients in the SICU of the PAH complex, who after meeting weaning criteria progressed to the point of extubation. Head injured and patients with multiple limb injuries were excluded.RSBI, P/F and muscle strength assessment were done. Upper limb, lower limb and head lift were scored according to the Oxford scale.
**RESULTS:** A total of 28patients were studied. 1failed extubation. 2 had incomplete data. 1 died. 24 had successful extubations.15 complied with all 3 parameters i.e. RSBI <105, P/F> 200, MAS >12. Of the remaining 9 pts, 3 had MAS <12, 8 had PF ratio <200 and 1 had RSBI> 105.
**DISCUSSION:** when all 3 parameters are met the extubation rate was 100 percent .If MAS was the only criterium met, the rate of successful extubation was 87.5 percent. P/F <200 as the only criterium was the most unreliable predictor. It was possible to extubate 1patients with a low P/F and high RSBI but a MAS >12.
**CONCLUSION:** Muscle strength assessment should be used as a predictor for successful extubation. The perfect muscle strength assessment tool has not been established.

## THE LEFT UPPER QUADRANT: THE BERMUDA TRIANGLE OF SURGICAL REPUTATIONS

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**INTRODUCTION:** The left upper quadrant contains a number of structures in close proximity. It is an area that is difficult to assess clinically and is prone to missed injury (ref). This prospectively collected series of penetrating trauma cases aims to demonstrate patterns of missed injury and clinical error in the left thoraco-abdominal region.
**METHODS:** All patients with a missed injury secondary to a penetrating stab or gunshot wound to the left thoraco-abdominal region were prospectively collated over a two year period. Both injuries missed by clinical examination as well as those missed at operative intervention were recorded. Surgery-related complications for trauma to left upper quadrant structures were also recorded.
**RESULTS:** A total of 22 missed injuries were identified; 17 being missed on clinical assessment and 5 at operative intervention. The injuries not detected by repeat clinical examination included four gastric perforations and ten diaphragm injuries; detected only at laparoscopy, and three posterior colonic perforations; where a tangential gunshot wound to the left upper back resulted in a posterior injury to the splenic flexure with a contained faecal abscess. All three of the latter splenic flexure injuries required a resection and defunctioning colostomy. Of those injuries missed at laparotomy, there were two involving the diaphragm and three to the anti-mesenteric border of the colon; with the outcome in two of the latter patients being death.
**CONCLUSION:** Clinical assessment of the left upper quadrant is difficult. In addition to the well known risk of missing a diaphragmatic injury, gastric and posterior colonic injuries may not reliably manifest clinical symptoms and signs when managed conservatively; resulting in significant morbidity and mortality. The role of laparoscopy in the early detection and repair of such injuries needs to be further explored.

## THE BURDEN OF BURNS AT A REGIONAL HOSPITAL IN SOUTH AFRICA

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**INTRODUCTION:** Burns are common injuries in peri-urban informal settlements. This study looks at the spectrum of burns admitted to a busy district hospital in South Africa and attempts to cost burn wounds in our setting.
**METHODS:** A prospective data base was maintained from September 2006 to February 2008 of all burn wound patients admitted to Edendale hospital. Standard demographic data, detailed description of the burn, surgical intervention, outcome and length of stay was recorded. A costing was performed using the data derived from the study. This formula was based on the average cost per day of hospitalization and the cost of dressings. The formulas used was (Patient number x number of days x hospital cost per day) + (cost to dress one percent BSA x average BSA burnt x number of patients x number of days). Operative costs were not calculated.
**RESULTS:** A total of 450 patients were admitted. Two hundred and thirty five were male. There were 203 burnt children admitted with an average age of 3 years (range 6 months to 9 years). Average age for adults was 40 years (range 16 to 82 years). The average burn size was fourteen percent total body surface area (range 1 – 90%). In adults the average burn depth was superficial (40%), deep dermal (16%) and full thickness (31%). In children the breakdown of burn depth was superficial (70%) deep dermal () and full thickness () in adults the aetiology of the burn was flame (48%), hot water (26%) and electrical (7%) and miscellaneous (19%) In children the aetiology was hot water (70%) and fire (8%) and miscellaneous (22%) Miscellaneous causes included hot oil or porridge (12), electrical (17), chemical (4), flash burns (10) and lightening (6). Fifty percent of adults were epileptic and had sustained their burn wound during a seizure. Fifteen percent had a delayed presentation of on average eleven days. Hospital stay averaged 48 days (3.5 days per percent burn). (range 1 day to 161 days). Two hundred and two (45%) of patients required grafting. The average time from burn to graft was 51 days (range 12 - 138). There were forty deaths (9%) with an average age was 50 years (range 6 months to 82 years) and an average total burn surface area of 50%. (range 14-85%) Aetiology of the burn in the deaths was fire in (30) and lightening (4) and hot water (6). Cause of death was burn wound sepsis in (15) inadequate resuscitation in (2) . In the remaining 23 patients palliative treatment was decided on due to extent of the burn. The estimated cost of hospital stay and wound care was thirty four million ZAR (five million USD)
**CONCLUSION:** Young children and epileptics are particularly vulnerable to sustaining burn injuries. Our hospital sees a large number of burns predominantly smaller surface areas. Patients have a prolonged hospital stay and delayed grafting due to a conservative surgical approach and lack of resources. Large burns are fatal in our hands. Burn care is a major cost driver.

## THE OUTCOME OF BURN PATIENTS WITH HIV/AIDS

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**ABSTRACT**
Introduction: Predicting outcome for burn patients has major implications. Previous papers on the outcome of burn injury and Hiv/Aids had conflicting results and compared the outcome of Hiv-positive and Aids-patients as one group with the Hiv-negative patients.
**AIM**: Compare the outcome of Hiv-negative burn patients with those who are Hiv-positive or have Aids separately.
Hypothesis: The outcome of Hiv-positive patients who suffer burn injury is similar to Hiv-negative patients unless they have Aids.
**MATERIAL AND METHOD**: A retrospective analytical study was performed on all patients treated for burns at Kalafong Hospital,Pretoria since January 2003 for whom Hiv-status was known.Outcome is compared between 3 groups of patients:Hiv-negative,Hiv-positive and Aids.
**RESULTS**:76 patients with a Hiv-test were treated,25 were Hiv-positive and of them 6 had Aids.Mortality rate was similar in the 3 groups.Complications occurred more frequently in patients of the Aids-group 100%(6/6) vs. 65%(11/17) Hiv-positive and 65%(30/46) Hiv-negative groups.Baseline serum-Albumin and Hemoglobin-levels appear to be progressively lower from Hiv-negative to Hiv-positive to Aids. Patients with Aids and Hiv-positive patients required more blood transfusions compared with Hiv-negative patients.The average number of days in hospital is increased when burn patients have Aids.
**CONCLUSION**: Hiv-positive patients with burn injury have an outcome similar to Hiv-negative patients,but may require more blood transfusions.The outcome is worse when patients have Aids.

## THE SPECTRUM OF TRAUMA ADMISSIONS TO ICU IN PIETERMARITZBURG

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**INTRODUCTION**
The trauma load on ICU's in South Africa is great. This retrospective review of the trauma load on the two ICU's in Pietermaritzburg looks at the demographics and the outcome of trauma patients in ICU.
**METHODS**
This is a retrospective study of the trauma admissions to the ICU at Grey's and Edendale Hospitals from January 2007 until December 2007. We used the admissions book of the ICU. We divided the trauma admissions into the type of trauma: blunt or penetrating. We sub-divided penetrating trauma into trauma due to gunshot wounds and trauma due to stab wounds. The patients' age and sex was recorded. The number of days spent in ICU was calculated for each patient and the survival or death of the patient was recorded.
**RESULTS**
A total of 179 trauma patients were admitted to ICU. There were 48 GSW, 60 stab wounds and 71 blunt traumas. The average age for patients with GSW was (26), stab wounds (27) and blunt trauma (31). The mortality rate was GSW (25%), stab wound (13%) and blunt trauma (14%). The average length of stay was GSW (6 days), stab wound (4 days) and blunt trauma (4 days).
**CONCLUSION**
There is a significant trauma load on our ICU's. Although penetrating trauma as a whole still exceeds blunt trauma, blunt trauma is a major contributor to admission to ICU. Gunshot wounds seem to be on the decline relative to stab wounds and blunt trauma; however gunshot wounds are associated with a much higher mortality. Blunt trauma is an evolving problem and this is a new phenomenon in South Africa

## ABDOMINAL TRAUMA IN DURBAN: FACTORS INFLUENCING OUTCOME

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**AIM**: To present our experience with the management of abdominal trauma in Durban, document factors influencing outcome, and compare ISS and NISS in predicting outcome.
**PATIENTS AND METHODS**: Prospective study of patients with abdominal trauma in one surgical ward at King Edward VIII Hospital in Durban from 1998-2004. Demographic details, cause of injury, delay before surgery, clinical presentation, presence of shock, findings at surgery, management and outcome were documented. The ISS and NISS were compared between survivors and deaths.
**RESULTS**: 488 patients had abdominal trauma with mean age 29.2 ± 10.7 years and M: F ratio= 12:1. Mechanisms of injury were stabs (200), firearms (240) and blunt (48). 442 patients (90%) had laparotomy and the rest were managed non-operatively. Delay before laparotomy was 11.9 ± 16.5 hours; 340 patients had delay of ≤ 12 hours and 102 had delay of > 12 hours. 55 patients (11%) were shocked on admission. 73 patients had disembowelment. The mean ISS was 11.1 ± 6.7 and the mean NISS was 17.1 ± 11.1. 138 patients (28%) required ICU management with mean ICU stay of 5.5 ± 5.5 days. Complications occurred in 131 patients (27%) with rates of 38% in those with a delay ≤ 12 hours and 52% with a delay of >12 hours ($p < 0.0001$). Complication rate for patients with hollow visceral injury was 42%% compared to 28% in those without hollow visceral injuries ($p=0.57$). 51 patients died (11%) mortality for stabs, firearms and blunt trauma being 4%, 14%, 21% respectively.
The mortality rates increased with increasing number of organs injured and increasing ISS and NISS ($P<0.0001$). Laparotomy was negative in 2% of patients of whom 9% developed complications and none died.
**CONCLUSION**: The majority of abdominal injuries are inflicted by firearms. Hemodynamic instability, mechanism of injury, presence of hollow visceral injuries, and injury severity all have an impact on mortality. Delay before surgery influences the morbidity but not mortality rate.

## THE MANAGEMENT OF THE RETAINED KNIFE BLADE AT A MAJOR TRAUMA CENTRE

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**BACKGROUND**: Penetrating knife wounds are common in South Africa. The retained knife blade, however, remains an unusual and spectacular injury. Isolated case reports and small series have been described by many centres worldwide. The aim of this study was to review the management of this injury at a high volume level one urban trauma centre
**METHODS**: A retrospective review of patients with impacted knife blades treated at Groote Schuur Hospital Trauma Centre from January 1996 to December 2007 was undertaken. The medical records were analyzed for demographic data, mechanism of injury, associated injuries, treatment, anaesthetic management, duration of hospital stay, complications and outcome.
**RESULTS**: Thirty-three patients with impacted knife injuries were identified (32 males and 1 female with mean age of 29.6 years). The mean Revised Trauma Score was 7.73. Site of wound entry was the thorax in 13 patients (40%), the neck in seven (21%), the back in seven (21%), upper and lower extremities in four (12%) and the face and abdomen in one patient each (6%). Thirty patients (91%) were haemodynamically stable on admission; two (6%) presented with wound abscesses and one patient (3%) with active bleeding required emergency surgery. All 33 blades were extracted in the operating room after clinical and radiological assessment. General anaesthesia was used in 31 patients (94%) and local anaesthesia in two patients (6%). Simple withdrawal of the blade was possible in 19 cases (58%) whilst 13 patients (39%) needed an open surgical approach achieved through dissection of the entry wound, laparotomy or thoracotomy. Video-assisted thoracoscopic removal was used in one case (3%). Bleeding after simple withdrawal was observed in only one patient. There were no deaths.
**CONCLUSIONS**: All impacted knife injuries should be managed in the controlled environment of the operating room after careful clinical and radiological assessment and the exclusion of any vascular trauma.

## RETAINED WEAPONS

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**INTRODUCTION:** Retained weapons present challenges to trauma surgeons. This retrospective review documents our experience with these injuries in Pietermaritzburg.
**METHOD:** A prospective trauma database is maintained by the general surgical service of the Pietermaritzburg metropolitan complex. All patients who presented with a retained weapon between July 2006 and May 2008 were identified and reviewed.
**RESULTS:** We identified ten patients who had presented with a retained weapon. They were all males. The age range was typical of trauma 19-35. The location of the retained weapon was head and neck (7), back (2) and chest (1). The investigations done included plain X-rays (10), CT scan angiography (6) and formal angiography (1). All weapons were removed in theatre. There was one death. A single patient was rendered paraplegic. A single patient required enucleation to remove a disrupted eye and a single patient required repair of his carotid artery.
**CONCLUSION:** Retained weapons must be investigated prior to removal. They are morbid injuries. The weapon should be removed under controlled circumstances. Residual morbidity is usually related to the site of the weapon.

## HER 2 RECEPTOR EXPRESSION IN BLACK PATIENTS WITH EARLY BREAST CANCER AT THE DR GEORGE MUKHARI HOSPITAL

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**BACKGROUND:** HER 2 receptor expression is a prognostic factor in cancer of the breast.
**AIM:** Our aim was to see if there are patients with early breast cancer previously treated who is node negative but need adjuvant therapy because of HER 2 expression.
**METHODS:** Twenty six patients with early breast cancer from 2003 – 2008 were studied retrospectively. Patients were investigated with Ultra Sound, Mammography, MRI and FNA and treated surgically i.e. lumpectomy, skin sparing mastectomy and modified radical mastectomy. From 2003, patients were given adjuvant therapy based on axillary node status. Premenopausal adjuvant therapy was given as CMF whereas Tamoxifen was reserved for postmenopausal patients. HER 2 expression was studied using stored pathological specimen with immunohistochemistry.
**RESULTS:** The age of patients ranged from 29 – 82 years (average ± 55years). Twenty five percent of the patients were $T_1$ $N_0$ $M_0$, 4% $T_1$ $N_1$ $M_0$, 63% $T_2$ $N_0$ $M_0$, 8% $T_2$ $N_1$ $M_0$. Sentinel node was negative in 69%. Ninety two percent had ductal carcinoma and 8% lobular carcinoma. HER 2, oestrogen and progesterone receptor expression was 43%, 56% and 58% respectively. Twenty five percent of patients expressing HER 2 receptors had histologically negative axillary nodes.
**CONCLUSION:** A subset of patients with early breast cancer require adjuvant therapy because of HER 2 receptor expression.

## BREAST FIBROADENOMAS: WATCH AND WAIT OR WHIP ALL OUT?

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**INTRODUCTION:** Fibro adenomas (FA) of the breast are common. Triple assessment results in a confident diagnosis and distinguishes them from breast cancer. Women with FA are not at significant increased risk of developing breast cancer. Traditionally symptomatic FA are treated by surgical excision; however, there is agreement that some will resolve, supporting conservative approaches.
**OBJECTIVE:** We aimed to analyze our experience with this common breast disorder in terms of numbers, characteristics, management and outcome over a 6 year period; assess the natural history of those FA managed expectantly, and provide a rational approach to the management based on our local experience and findings.
**METHOD:** This was an audit of patients with symptomatic FA who presented to the Breast Clinic at Addington Hospital over a 6 year period from 2002 to 2008. The records of all patients presenting with benign breast disease were reviewed and only those with a confirmed diagnosis of FA on triple assessment were included in the study. Data extracted from the proforma included patient and lesion characteristics, management and outcome.
**RESULTS:** Over the 6 year study period, 1443 patients were seen with benign breast disease, of which 327 (23%) had a confirmed diagnosis of FA. The average age of these patients was 26 years and 20% gave a family history of breast cancer. The majority of lesions were single with an average size of 2.3cm. Giant FA accounted for 15% of the total, and 6% of FA were diagnosed during pregnancy. Surgery was performed in 125 (38%) patients upfront; the remainder (202) were managed conservatively. The average follow-up in this latter group was 8.5 months with 33/202 patients eventually undergoing surgery. Only 4 patients had documentation of resolution of the FA; the remainder (165) either had no data or were lost to follow up. In total 158 patients (48%) had surgical excision. There were no missed diagnoses of cancer or any recurrences in this group.
**CONCLUSION:** Symptomatic FA account for just under a quarter of benign breast pathology seen at our Breast Clinic. The majority are single lesions in young adults. No recurrences have been documented following surgical excision. We have been unable to determine the natural history of those managed expectantly. Poor follow-up compromises conservative management in our centre. Our policy has been amended based on the findings of this audit.

## MALE PATIENTS WITH BREAST PATHOLOGY FROM A SINGLE SPECIALIST BREAST UNIT IN SOUTH AFRICA

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**BACKGROUND**: Breast cancer in male patients is similar to that in female patients when considering predisposing factors, clinical presentation and management. The incidence of male breast cancer is approximately 1%. 30% of patients having a positive family history. Onco-Reconstructive techniques in male breast cancer are seldom used but may require autologous flap reconstruction.
**METHOD**: A corrobative look at male patients from a single unit that only sees patients with breast related problems. 10 Male patients were identified.
**RESULTS**: This study looks at the age distribution, risks factors, clinical presentation, and treatment protocols offered in a specialist unit. The onco-reconstructive procedures offered ( autologous reconstructions) are used not for aesthetic indications but for oncological margins both in duct carcinomas and for breast sarcomas
**CONCLUSION**: These patients require a multidisciplinary approach due to late diagnosis, challenges around masculinity and impact around latissimus flap reconstruction and manual labour .The need to counterbalance aggressive oncological and surgical managements ; psychological support and understanding the important role of reconstruction in these patients should not be underscored.

## ULTRASOUND VASCULAR RESISTIVE INDEX AS A PREDICTOR OF NEOPLASMS IN THYROID NODULES

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**INTRODUCTION**: The purpose of this study was to evaluate whether the ultrasound resistive index (RI) is useful for distinguishing benign from neoplastic solitary thyroid nodules.

**METHODS:** Twenty nine solitary thyroid nodules with subsequently histologically proven diagnoses were studied to determine RI. RI was defined as

$$RI = \frac{\text{Systolic peak velocity} - \text{diastolic peak velocity}}{\text{systolic peak velocity}}.$$

Duplex U/S spectral wave forms were obtained from at least three intra-nodular blood vessels to determine RI.
**RESULTS:** Twenty nine patients with a mean age of 42 years (Range 24 – 77) and a M:F ratio 1:28 were studied preoperatively. The histological results were multi-nodular (15), Follicular adenoma (6) Hurthle cell adenoma (1), Follicular carcinoma (3) Papillary carcinoma (2), Anaplastic carcinoma (1), and metastatic squamous cell carcinoma (1). The mean RI ± SD for multi-nodular goitre was 0.5 ± 0,112 compared to 0.6 ± 0.1 in neoplastic solitary thyroid nodules. Thirteen of the benign nodules had RI $\leq$ 0.5 whereas in 10 out of 14 neoplasms had RI was
$\geq$ 0.6. The specificity for benign was 87% with a low sensitivity, whereas specificity for malignant nodules was 71% with a low sensitivity and
($P < 0.001$ $x^2$).
**CONCLUSION:** Vascular resistance as estimated by RI is increased in neoplastic thyroid nodules.

## PRIMARY REPAIR OF TRACHEAL INJURIES: OUR EXPERIENCE AT SEBOKENG HOSPITAL

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**INTRODUCTION:** Tracheal injuries pose a serious problem in airway management. The management of these injuries has traditionally been to repair the injury and then to do a tracheostomy. Our experience at Sebokeng, however, has been that tracheal injuries can be managed with primary repair.
**AIM:** The aim of this study is to present the role of primary repair in tracheal injuries.
**METHOD:** A retrospective review of patients presenting with tracheal injuries was undertaken. These patients presented between April 2007 and May 2008. A total of 11 patients were reviewed.
**FINDINGS:** The majority of patients had simple tracheal injuries. 2 had bronchial injuries. 1 was a child who had an associated jugular vein injury. 2 had an associated oesophageal injury. 1 patient had an almost complete transection of the trachea. All tracheal repairs were done primarily with no tracheostomy. All patients did well with no further complications.
**CONCLUSION:** Primary repair of tracheal injuries is a viable and safe method of the management of tracheal injuries.

## CONTROL OF PRIMARY HYPERTHYROIDISM IN EIGHTY-ONE PATIENTS WITH GRAVE'S DISEASE AFTER TREATMENT WITH $I^{131}$.

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**INTRODUCTION**: Primary hyperthyroidism (HTD) accounts for most cases of HTD with more than 50% of patients presenting with Grave's opthalmopathy. Therapeutic options include antithyroid medications, radioactive iodine, and thyroidectomy. There is a small risk for development or progression of eye signs following $I^{131}$ therapy.
**AIM**: The aim of this study was to determine the effectiveness and time to control hyperthyroidism in patients with primary HTD following low dose radio ablation (RA) with $I^{131}$, the number of patients requiring repeated dosages before suppression of thyroid functions (TF) and feasibility of outpatient management.
**PATIENTS AND METHODS**: This is a retrospective study of patients treated for Grave's disease at the special thyroid clinic at Kalafong Hospital. Patients' demographics, presence of exophthalmos, TF tests, thyroid ultrasound scan and thyroid radionuclide scan uptake percentage at initial presentation were recorded on a special patient proforma. RA dosages and initial suppression of TF were also noted. The treatment outcome was determined by achievement of biochemical euthyroid or hypothyroid state.
**RESULTS**: Eighty-one patients (65 females, 16 males) with an age range of 13-75 years were treated between 2002 and 2006. Sixty (74, 1%) of these had clinical eye signs. No patient experienced worsening of opthalmopathy after RA. The uptake (pre-RA) and dosage ranges were 26-89,3% and 5mCi-15mCi respectively. Radioiodine was used as the only treatment in seventy-four patients (91, 4%) and hypothyroidism was achieved in 96, 1% of patents within six months. RA was repeated in three patients (Table 1).
**CONCLUSION**: Exophthalmos is common in Grave's disease and radioactive uptake was higher. RA alone without glucocorticoids was effective in patients with opthalmopathy and there was no worsening of eye signs. Radioactive treatment is feasible on an outpatient basis. Treatment with lower doses of $I^{131}$ is effective in primary HTD and because of fear of long-term risks of development of thyroid carcinoma, it is advisable especially in areas with poor patient follow-up.

## LAPAROSCOPIC SPLENECTOMY: INITIAL EXPERIENCE AT GSH

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**AIM:** to evaluate the surgical outcome of laparoscopic splenectmoy at at tertiary hospital.
**METHODS:** a prospective audit of Laparoscopic Splenectomies performed by a single surgeon at Groote Schuur Hospital From 2001 to 2008.
**RESULTS:** 30 laparoscopic splenectomies were performed. The most common indication for surgery was Immune Thrombocytic Purpura (23). Other indications included Auto-immune Haemolytic Anaemia (3), Thrombotic Thrombocytic Purpura (2), Splenic Lymphangioma(1) and Splenic Tuberculosis (1). There were 6 conversions to open splenectomy. The average operating time of unconverted operations was 93 minutes. The average post-operative stay was 2.26 days (unconverted cases). 1 patient required an emergency laparotomy on day 15, for bleeding from the splenic hilum. There were no deaths.
**CONCLUSION:** laparoscopic splenectomy is a safe alternative to open splenectomy.

## COMPARATIVE ANALYSIS OF ACUTE AND CHRONIC PANCREATITIS PATIENTS SEEN AT KALAFONG HOSPITAL

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**INTRODUCTION:** Chronic pancreatitis was considered a complication of acute pancreatitis. The two are now identified as separate disease entities. The clinical presentation in early stages is similar and misdiagnosis can be made.
**AIM:** To compare clinical presentation of patients with acute and chronic pancreatitis admitted to Kalafong hospital.
**METHOD:** Retrospective cross-sectional study from January 2005 to December 2006. Reviewed patient files, computer records, discharge summaries and laboratory records. Demography, etiologic factors, imaging results, and pancreatic enzymes were assessed.
**RESULTS:** Total patients 66. Acute pancreatitis 44 and chronic pancreatitis 22. Average age for chronic pancreatitis 49 years and acute pancreatitis 33 years. 11 chronic pancreatitis had raised pancreatic enzymes and were diagnosed on ERCP whilst 8 were diagnosed on CT scan. 3 diagnosed initially as acute pancreatitis turned out to be chronic pancreatitis on ERCP.
**DISCUSSION:** Chronic pancreatitis is diagnosed late in our hospital and 14% of chronic pancreatitis patients were misdiagnosed as acute pancreatitis. Average age in this group was 47 years with average lipase 441 and amylase 926. In 86% of cases the diagnosis of chronic pancreatitis was based on overt radiological changes.
**CONCLUSION:** The diagnosis of chronic pancreatitis is made late at Kalafong hospital. It's mainly based on ERCP and CT radiologic findings. Elevated pancreatic enzymes did not exclude chronic pancreatitis.

## MINIMALLY INVASIVE RETROPERITONEAL PANCREATIC NECROSECTOMY: AN EARLY EXPERIENCE

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**INTRODUCTION:** Infected pancreatic necrosis remains a dreaded complication of acute severe pancreatitis. A minimally invasive retroperitoneal surgical approach has proved a useful at improving the associated dismal outcome. This report presents an early experience with this procedure in South Africa.
**PATIENTS AND METHOD:** Between January 2006 and March 2008, consecutive patients with severe acute pancreatitis and infected necrosis were subjected to a minimally invasive retroperitoneal necrosectomy (MIRP) and establishment of continuous lavage of the cavity through the necrosectomy tract. MIRP is performed following initial resuscitation and stabilization of patients in a high care or intensive care environment and within 48 - 72hrs of a radiologically placed percutaneous catheter. Under image guidance, the tract is dilated to a 34Fr size, over a guide wire, using graduated urology Amplatz dilators. A piece-meal necrosectomy and/or debridement are then performed through a nephroscope. Thereafter, an irrigation system is established with the placement of an irrigating-draining Fuller Sump catheter. The procedure is repeated in line with the patient's clinical and radiological progress. Operative time, related complications, mortality and hospital stay are analysed.
**RESULTS:** There were seven patients: 5 males, 2 females, median aged 34 (29 – 63) years. All had one or more organ dysfunction/failure at presentation. Median procedure per patient was 3 (2 – 4). Median operation time and blood loss were 2 (1.2 – 2.48) hours and 150 (100 – 350) mls respectively. Of two patients that developed pancreatic fistula, one resolved spontaneously and the other, with endoscopic therapy. No mortality in this group. Median ICU/HCU and hospital stays were 16 (6 – 29) days and 46 (40 – 80) days respectively.
**CONCLUSION:** From this initial experience, MIRP is safe, fairly effective in treating infected pancreatic necrosis with minimal or no adverse outcome.

## EXPERIENCE WITH ENDOSCOPIC DRAINAGE OF PANCREATIC PSEUDOCYST IN A SINGLE UNIT

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**INTRODUCTION:** Endoscopic drainage of pseudocysts is feasible and has been found to be comparable to open surgical drainage. We performed an audit of our experience with this technique.
**PATIENTS AND METHODS:** Patients undergoing pseudocyst drainge in a single unit were reviewed in the period 1999-2008. Demographic data were noted, presenting symptoms and mode of cyst drainage, complications following intervention and outcomes. Enteric cyst drainage was performed using ERCP needle knife entry and pigtail stenting without the aid of endosonar.
**RESULTS:** In the period 1999-2008, 40 patients underwent drainage procedures for pancreatic peudocysts . There were 10 females and 30 male patients with an age range of 4 - 68 years. The aetiology of the pseudocysts was: Acute pancreatitis in 26, chronic pancreatitis in 1 and trauma in 13 patients. Pain was the presenting complaint in 17, gastric outlet obstruction in 4 and obstructive jaundice in 1 patient. The methods of cyst drainage are illustrated in the table. Endoscopic drainage was performed in 37 patients and successful in 34. In 3 patients this was complicated by perforation, infection and haemorhage. Two (5%) of this group died.

**Table:**

| Drainage method | n |
|---|---|
| Transgastric | 30 |
| Transduodenal | 2 |
| Transampullary | 3 |
| Percutaneous | 2 |
| Spontaneous transduodenal | 1 |
| Open surgery | 2 |

There was no follow-up in 6 patients, and ranged from 1 month to 3.5 years in the others.

**CONCLUSIONS:** Endoscopic cyst drainage is the method of choice in our hands. Introduction of endosonar may limit complication. Follow-up remains inadequate.

## OUTCOME ANALYSIS OF PANCREATICODUODENECTOMIES AT GROOTE SCHUUR HOSPITAL - AN INTERIM ANALYSIS

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**AIM:** To review the outcome of non trauma related pancreaticoduodenectomies performed at Groote Schuur Hospital between 1980 and 2007.
**METHODS:** Retrospective analysis was performed .The pathology, post operative complications and mortality was reviewed. A sub- analysis compared the results of the three decades.
**RESULTS:** The male:female ratio was 135:96 with a median age of 57 years. Of the 221 patients, 159 had a pylorus-preserving pancreaticoduodenectomy and 62 a standard Whipple procedure.

| Pathology | N=221 |
|---|---|
| Adeno carcinoma | N=69[31%] |
| Ampullary tumour | N=69[31%] |
| Chronic Pancreatitis | N=28[13%] |
| Cholangiocarcinoma | N=18[8%] |
| Cystic Neoplasm | N=14[6%] |
| Duodenal carcinoma | N=5[2%] |
| Other | N=15[7%]] |

The in hospital mortality was 5.5% (n=12).The causes of death were bleeding (n=4), liver necrosis (n=1), multi-organ failure (n=6),and DVT/PE (n=1).I

The complications were: pancreatic fistula n=31(14%), bile leak n=20(9%), delayed gastric emptying n=25(11%), septic complications n=38(17%), bleeding n=16(7%) and other n=25(11%). Re-operation was required in 7% for bleeding. There was no difference in the complication rates between the three decades. 84(38%) Patients had no complications.
**CONCLUSION:** Pancreaticoduodenectomies remains a major physiological insult with significant morbidity and mortality.

## THE CHANGING PATTERN OF GALLSTONE DISEASE, ITS MANAGEMENT AND COMPLICATIONS IN A SINGLE INSTITUTION OVER A 20-YEAR PERIOD: A RETROSPECTIVE EVALUATION

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**Abstract:**

**Background:** Gallstone disease (GD) is a common public health problem with potential serious complications. The aim of this study was to investigate the changing patterns of GD, its management, complications and outcome.
**Patients and methods:** A retrospective study of all patients presenting with GD over a 20-year period was performed. Discharge letters and summaries of all GD-related admissions were retrieved from a computer database. Patients' demographics, diagnosis, management, complications and outcome were noted.
**Results:** A total of 740 patients (F:M, 4,1:1) with GD-related conditions were recorded mostly in the 41-50 year age group (33%). The number of gallstone cases has increased (0.7-1,9%) and that of common bile duct (CBD) decreased (14%-8%). Patients with CBD stones were older than those with gallbladder (GB) stone. We found a slight decrease and increase in GD in males (20,4% to 19%) and females (79,6% to 81%) respectively. Gallstone acute pancreatitis (GAP) and acute cholangitis (AC) occurred in 6,6% and 10% of patients respectively. Laparoscopic cholecystectomy (LC) rate increased from 21,1% to 44,1% and open CBD exploration decreased (6,25 to 2 %). GAP was associated with white females (mean age 49 years). Two CBD injuries (LC) both in the second decade were documented. Four patients, all females died from acute cholecystitis-related complications. GAP and AC were the leading cause of death (Tables 1). The in-hospital mortality rate per respective decade was 1, 7% and 1, 4%.
**Conclusion:** Increasing tendency of GB stone and GAP was attributed to changing demographics but also an absolute increase in blacks. We associated decreasing tendency of CBD stone to wider use of LC. Men seem to suffer GAP complication later in the course of GD than do females. Concomitant cholangitis occurred more frequently in older male patients with obstructive jaundice. The study confirms association between advanced age and death from GAP. We linked the downward trend in mortality to wider use of endoscopic and laparoscopic procedures.

## NONOPERATIVE MANAGEMENT OF 62 LIVER GUNSHOT INJURIES

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**BACKGROUND:** Nonoperative management (NOM) of liver gunshot injuries is yet to gain universal acceptance. The aim of this study was to assess the feasibility and safety of selective nonoperative management in liver gunshot injuries.
**PATIENTS AND METHODS:** Prospective, protocol-driven study, which included all liver gunshot injuries admitted to a level I-type trauma center, over a 4-year period. Patients with hemodynamic instability, peritonitis, or an unevaluable abdomen underwent an immediate laparotomy. Patients who were hemodynamically stable and had no signs of generalised peritonitis with either a missile trajectory traversing right upper quadrant and/or localised RUQ tenderness underwent CT scan evaluation to detect the presence of a liver injury. In the absence of CT scan findings suggestive of hollow a viscus injury, the patients were observed with serial clinical examinations. Outcome parameters included survival, complications, need for delayed laparotomy, and length of hospital stay.
**RESULTS:** During the study period, there were 194 patients with gunshot injuries to the liver: 132 (68%) patients underwent met the criteria for immediate operation and 62 (32%) patients were selected for nonoperative management of their liver injury. The mean injury severity score was 19.6 (range 4-34). The liver injury grading was: grade II-21(33.9%), grade III-10(16.1%), grade IV-25(40.3%) and grade V-6(9.7%). Associated injuries related to the same missile causing the liver injury were: kidney (14), diaphragm (44), lung contusion (40), haemo/pneuomothorax (43) and rib fractures (21). Only two patients required a total of 6 u packed cell transfusion. Complications included: failed abdomen observation (5), liver abscess (2), biliary fistula (1), retained haemothorax (4), and nosocomial pneumonia (5). The mean hospital stay was 7.1 (range 3-20) days. There was no mortality.
**CONCLUSION:** The nonoperative management of appropriately selected patients with liver gunshot injuries is highly feasible, safe and effective, regardless of the severity of liver injury.

## OUTCOMES OF HEPATIC RESECTION FOR COLORECTAL METASTASES

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**AIM:** To determine outcomes of hepatic resection of single and multiple colorectal liver metastases (CRLM).
**PATIENTS AND METHODS:** 107 patients (62 men, 45 women, mean age: 58 years, range 18-79) underwent liver resection for CRLM between December 1987 and April 2006. Data was collected prospectively and 105 patients were followed up until May 2007.
**RESULTS:** 50 patients had a single metastasis resected (Group A), 34 had 2 or 3 metastases (Group B) and 23 had 4 or more (range 4-9) metastases resected (Group C). Mean operative time was 254 min (range 135-435) in Group A, 274 min (range 150-525) in Group B, and 319 min (range 180-510) in Group C ($p = 0.005$). There were no significant differences in inflow occlusion time ($p = 0.30$), intra-operative blood loss ($p = 0.13$), blood transfusion ($p = 0.20$) or hospital stay ($p = 0.92$). 6 patients died in hospital, 3 in A, 2 in B, and 1 in C (peri-operative mortality 5.6%). 14 patients in Group A had postoperative complications (9 major, 5 minor) as opposed to 12 in Group B (5 major, 7 minor) and 7 in Group C (5 major, 2 minor). Survival did not differ significantly between the three groups ($p = 0.66$). Actual 3 year survival was 22% in Group A (10 alive out of 46 patients 3 years post surgery), 22% (7/32) in Group B and 14% (3/22) in Group C. 5 year survival was 18% in A, 13% in B, and 15% in C. 10 year survival was 12% in Group A, 14% in Group B, and 8% in Group C.
**CONCLUSION:** The outcome of liver resection for multiple colorectal metastases is comparable to resection for single lesions.

## OUTCOME IN 39 PATIENTS FOLLOWING PERCUTANEOUS TRANSHEPATIC BILIARY DRAINAGE PERFORMED OVER ONE YEAR AT CH BARAGWANATH HOSPITAL

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**AIM**: To determine outcome in patients following percutaneous transhepatic biliary drainage (PTC) at CH Baragwanath Hospital.
**METHODS**: Retrospective analysis of prospectively collected data. All patients undergoing PTC at CH Baragwanath from 1 May 2006 to 30 April 2007.
Results: Forty nine patients had a PTC from 1 May 2006 to 30 April 2007. Complete records were available for 39; 27 females and 12 males. Average age 57.6 Yrs (23-96). The aetiology of biliary obstruction was malignancy in 22, suspected malignancy in 9, benign in 5 and indeterminate in 4. Ten had a PTC as the first biliary drainage. Twenty nine had prior attempts at endoscopic biliary drainage.
**RESULTS**: Twenty five patients died before discharge. Of these, eighteen had the PTC in situ at time of death. Five had their PTC internalized, 2 endoscopically and 3 percutaneously. One patients PTC became displaced and one patient had an open bypass.
In patients who died the average duration from admission to insertion of PTC was 6 (0-27) days. Survival following PTC insertion was an average 13 (0-42) days. Average hospital stay was 20 (2– 49) days.
Fourteen patients were discharged. Three patients had their PTC in situ. Eight had successful internalisation, 5 endoscopically and 3 percutaneously. Two required open bypass. A single patient with a previous hepaticojejenostomy was deemed to have adequate drainage and the PTC was removed.
Duration from admission to PTC insertion was 13 (4-27) days. Time from PTC insertion to discharge was 17 (3-44) days. Average hospital stay of survivors was 37 (13 – 72) days.
**CONCLUSION**: Percutaneous biliary drainage has a 65% in hospital mortality. The majority of patients, 75%, had failed attempts at endoscopic drainage (29 of 39). Prolonged hospitalisation is common (average 24 days). There is a need to identify factors that predict poor outcome.

## BYPASS SURGERY FOR BILIARY OBSTRUCTION IN CHRONIC PANCREATITIS

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**INTRODUCTION**: Bile duct stricture occurs in 10-30% of chronic pancreatitis. Hepaticojejunostomy (HPJ) or choledochojejunostomy (CD-J) and pancreaticoduodenectomy form the standard of care. Opening the intrapancreatic bile duct with incorporation into the pancreaticojejunostomy has been reported. We present our experience with the use of HPJ or CD-J in the treatment of distal common bile duct stenosis (DCBDS) in patients undergoing duodenal preserving pancreatic resection for chronic pancreatitis.
**METHOD**: From a prospectively studied cohort of patients undergoing local resection of head of pancreas and pancreaticojejunostomy (LR LPJ), those that underwent concurrent HPJ or CD-J (performed to a section of the same Roux loop used for the LPJ) were analysed.
**RESULTS**: Twenty seven patients had HPJ (5) or CD-J (22) with the LRLPJ over a 14-year period. All had pain at a median duration of 4 (0.5 – 15) years. Of 22 patients with DCBDS, jaundice was present in all, while 7 (31.82%) presented with cholangitis managed with pre-operative endoscopic drainage used in all jaundiced patients. The median operative time, blood loss and transfusion rates were 4.5 (3 – 8.33) hours, 0.75 (0.3 – 2.0) L and 1 (1 – 2) units respectively. 3 patients developed pancreatobiliary related complications with one requiring surgery. There were no death and the overall median hospital stay was 16 (6 – 38) days. Median 7-year pain relief rate is 92.59%. No patient has recurrent jaundice.
**CONCLUSION**: DCBDS is common in chronic pancreatitis. HPJ or CD-J at the time of the primary LR LPJ is simple and safe with minimal morbidity and good long term results. This procedure is recommended as an alternative to draining the bile duct by incorporating it into the pancreaticojejunostomy.

## COMPUTER DIRECTED ROBOTIC GANTRY SYSTEM FOR GAINING PRECISELY TARGETED NEEDLE ACCESS TO THE RENAL COLLECTING SYSTEM DURING PERCUTANEOUS NEPHROLITHOTOMY (PCNL)

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**INTRODUCTION:** Obtaining safe and accurate access to a predetermined renal calyx is probably the most critical step when performing PCNL, and is usually also the most challenging. Current options for obtaining access include: two stage procedure (pre-operative access by interventional radiologist), bi-planar fluoroscopic guided techniques ("eye-of-the-needle" and triangulation), retrograde percutaneous access and robotic assisted access. Our aim with this experimental study was to develop a new method of gaining access which is rapid and reproducible, accurate, simple (performed by Urologist in theatre) and cost-effective.
**METHODS:** From August 2007 to January 2008, 6 additional fluoroscopy images (3 images at [90;0] position and 3 at [110;0]) were obtained from patients undergoing routine PCNL. These images were then used in the development of the software and hardware of the PCNL access system. A needle positioning gantry was designed and a prototype constructed. This mechanical arm guides the access needle, and is attached to the theatre bed and connected to a computer. A user-friendly graphic interface, including fluoroscopic images of the contrast filled renal calyces, is displayed on the computer screen, where the urologist then indicates the point of desired access. The system will calculate and predict the necessary translation and rotation of the needle from the current position in order to target the selected calyx. The Urologist uses this positioning information to adjust the gantry, lock it in position and then advance the needle.
**RESULTS:** The PCNL situation was simulated using the *ex vivo* porcine kidney as experimental model. With the aid of the new access system the targeted calyx could be successfully punctured on the first attempt.
**CONCLUSIONS:** Simulations in animal kidneys indicate that the new system for use by Urologists during PCNL is simple, cost-effective and provides percutaneous renal access that is fast and accurate.

## OPERATIVE FACTORS ASSOCIATED WITH MORTALITY AMONG NEONATE'S WITH GASTROSCHISIS IN ZIMBABWE'S PAEDIATRIC SURGICAL UNIT

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**BACKGROUND/PURPOSE**: Previous studies of Gastroschisis in Zimbabwe showed survivals below 42%, which contrasts with high survivals of above 90% in developed countries. The difference shows there is potential for improvement, and the aim of the study was to identify those operative factors associated with mortality.
**METHODS**: An 8 year retrospective analytical study was carried out. Case files of neonate's with Gastroschisis presenting to the unit during the period January 1996 to December 2003 were analyzed. Twenty potentially predictive variables were analysed against mortality. Statistical analysis included a univariate analysis, followed by a multivariate analysis on variables found to be statistically significant ($p<0.05$). The relative risks were estimated by computing the odds ratio and its 95% confidence interval.
**RESULTS**: 120 cases were analysed. **1)** Operative survival: 41%. **2)** Times for surgery: The time from birth to surgery was marginally non-significant between survivors and non-survivors (p=0.058, OR=1.04). There was no difference in the times between admission and operation for the two groups, and no association with mortality with regards to the time of day surgery, or NICU operations. **3)** Surgical procedures: Primary closure predicted for a better outcome (52% versus 29% survival, p=0.003, OR=3.7), and abnormal fibrin grades were associated with silo closure (p=0.011), and an adverse outcome (p=0.021, OR=4.3). Procedures to the bowel predicted for mortality (p=0,019, OR=7.6). **4)** Ventilatory support: There was no association between the type of closure and need for ventilation, however the need for ventilation predicted for mortality (CPAP p=0.006, OR=4.0) (IPPV p=0.001, OR=6.1). **5)** Multivariate analysis: Silo closure (p=0.008, OR=3.38), procedure on bowel (p=0.034, OR=6.6), CPAP (p=0.006, OR=4.4), and IPPV (p=0.001, OR=8.1) remained significantly associated with mortality.
**CONCLUSION:** There has been no improvement in the operative survival (41%). Silo repair predicts for a higher mortality, and its use was associated with an abnormal fibrin grade. There was no association between the type of abdominal closure and need for ventilatory support, however the need for ventilation predicted for mortality, as does as a surgical procedure to the bowel. It is recommended in our setting to attempt a primary closure, but not forced if there is respiratory compromise, in order to reduce the need for ventilatory support.

## POST-OPERATIVE FACTORS ASSOCIATED WITH MORTALITY AMONG NEONATE'S WITH GASTROSCHISIS IN ZIMBABWE'S PAEDIATRIC SURGICAL UNIT

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**BACKGROUND/PURPOSE**: Previous studies of Gastroschisis in Zimbabwe showed survivals below 42%, which contrasts with high survivals of above 90% in developed countries. The difference shows there is potential for improvement, and the aim of the study was to identify those factors associated with mortality post-operatively.
**METHODS**: An 8 year retrospective analytical study was carried out. Case files of neonate's with Gastroschisis presenting to the unit during the period January 1996 to December 2003 were analyzed. Twenty-five potentially predictive variables were analysed against mortality. Statistical analysis included a univariate analysis, followed by a multivariate analysis on variables found to be statistically significant ($p<0.05$). The relative risks were estimated by computing the odds ratio and its 95% confidence interval.
**RESULTS**: 120 cases were analysed. **1)** Post-operative survival: 41%. **2)** Post-operative complications and management: Respiratory distress >48 hrs post-op, receiving blood transfusion and parenteral nutrition were not associated with an adverse outcome. The development of a surgical complication was marginally non-significant (p=0.054, OR=3.44), however, those who required re-laparotomy (p=0.037), developed post-op haemorrhage (p=0.044, OR=4.1), and sepsis (p=0.018, OR=2.9), were associated with mortality. There was no association between sepsis and the type of closure, fibrin grade, gangrenous bowel, or procedure to the bowel. **3)** Times: The time to developing a surgical complication was sooner for silo closure but marginally non-significant (p=0.058, OR=1.15), and the time to removal of silo was not associated with outcome (p=0.137, OR=1.32). Primary closure was associated with starting oral feeds earlier (p=0.0001), and a shorter hospital stay (p=0.018, OR=0.93). **4)** Multivariate analysis: Only post-operative sepsis (p=0.004, OR=4.1) remained significantly associated with mortality.
**CONCLUSION**: There has been no improvement in survival (41%). Post-operatively, sepsis was found to be an independent predictor of mortality, but was not associated with the type of abdominal closure, the fibrin grade, procedure to the bowel, or gangrenous bowel. Primary closure was associated with a shorter time to oral feeds and shorter hospital stay. It is recommended to take special care in aseptic techniques, as well as close monitoring for sepsis, and its prompt treatment.

## CLAMP ABLATION OF THE TESTES (CAT) COMPARED TO BILATERAL ORCHIDECTOMY (BO) AS ANDROGEN DEPRIVATION THERAPY FOR ADVANCED PROSTATE CANCER

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**INTRODUCTION:** The traditional methods of administering androgen deprivation therapy (ADT) for prostate cancer are in the form of surgical castration (BO - bilateral orchidectomy) or medical castration (LHRH-agonists). BO is a minor surgical procedure and an effective form of ADT, however it has several drawbacks: pain, surgical complications such as bleeding and wound infection, the psychological effect of an empty scrotum and the use of theatre time, trained personnel and sterile instruments. In this study we evaluate a new method of castration which is quick to perform in an outpatient setting, may carry less morbidity and complications than BO, does not leave the patient with an empty scrotum and may be more cost effective than BO and LHRH-agonists.
**METHODS:** After approval of the study protocol by the Human Research Ethics Committee of Stellenbosch University, 14 patients requiring ADT for advanced prostate cancer were prospectively randomized to 2 groups: Group 1 underwent standard BO as per existing hospital protocol. Group 2 underwent clamp ablation of the testes (CAT) using a new incisionless method where the spermatic cord was crushed for 60 seconds just superior to each testicle. This procedure was performed using a specifically designed clamp (Burdizzo®). Both BO and CAT were performed under local anaesthetic infiltration. Patients were followed up at 72 hours, 7 days, 6 weeks and then 3-monthly.
**RESULTS:** The two groups were comparable with regard to patient age, Gleason grade and stage of prostate cancer. Average pre-procedure blood levels of prostate specific antigen (PSA), luteinizing hormone (LH) and testosterone (TT) as well as testicular volume (measured with ultrasound) were similar in the two groups. The mean operating time was 11.1 minutes for CAT and 17.4 minutes for BO. The visual analog pain score associated with the procedure was on average 12.6 for CAT and 8.4 for BO. Within the first 6 weeks after BO, 5 of 6 patients had developed a local wound complication, with 3 of the 5 patients seeking unscheduled medical attention for this. Six weeks after the procedure PSA levels had decreased from baseline by a mean of 42% in the CAT group and 68% in the BO group. TT levels at 7 days post-procedure had decreased by a mean of 56% from baseline in the CAT group (3 out of 7 patients had castrate TT levels) and 81% in the BO group (7 out of 7 patients had castrate TT levels), however by 6 weeks the mean TT reduction from baseline was only 13% after CAT and 75% after BO. The CAT procedure was adapted by clamping the cord at two levels for 60 seconds each, and in the last 2 CAT cases the TT levels were reduced by more than 90%. LH levels increased rapidly following both procedures and at 6 weeks were up by a mean of 200% from baseline in the CAT group and 461% in the BO group. Testicular size after CAT showed an initial increase (mean increase of 19% at 72 hours, 38% at 7 days) followed by a gradual decrease in size (mean of 21% at 6 weeks).
**CONCLUSIONS:** These preliminary data show a trend towards decreased procedure time and local wound complications for CAT compared to BO. The initial CAT procedures were not as effective as BO in achieving castration, but a learning curve in performing this new procedure effectively has been observed. Further study is ongoing to determine the efficacy of CAT compared to BO in achieving androgen ablation.

## A PROSPECTIVE, RANDOMISED STUDY COMPARING THE VIENNA NOMOGRAM TO AN 8-CORE STANDARD TRUS GUIDED PROSTATE BIOPSY PROTOCOL

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**AIM:** To compare prostate cancer detection rates at first and repeat biopsies using a standard 8-core biopsy protocol versus the Vienna nomogram for determining the number of biopsy cores; **2.** To compare the side-effect profile of a standard 8-core versus the Vienna nomogram biopsy protocol.
**PATIENTS AND METHODS:** Men with a serum PSA ≥2.5 ng/ml or suspicion of prostate cancer on digital rectal examination were stratified according to serum PSA into low, intermediate and high risk groups (I = PSA 2.5-10; II = PSA 10.1-30; III = PSA 30.1-50 ng/ml) and were then randomised into two arms. Group A underwent a standard 8 core TRUS guided prostate biopsy and Group B underwent TRUS guided prostate biopsy with the number of cores determined according to the Vienna nomogram, based on the patient's age and prostate volume as measured by TRUS. Biopsies were performed under local anesthesia using periprostatic infiltration of 2% lignocaine. The study was approved by our institutional review board, and written informed consent was obtained from all study subjects.

Vienna Nomogram: Number of biopsy cores based on patient age and prostate volume

| | Age (years) | | | |
|---|---|---|---|---|
| Prostate size (ml) | Younger than 50 | 51-60 | 61-70 | Older than 70 |
| 0-30 | 8 | 8 | 8 | 6 |
| 31-40 | 12 | 10 | 8 | 6 |
| 41-50 | 14 | 12 | 10 | 8 |
| 51-60 | 16 | 14 | 12 | 10 |
| 61-70 | 18 | 16 | 14 | 12 |
| >71 | 18 | 18 | 16 | 14 |

**RESULTS:** In the period August 2006 to March 2008 we randomised 210 patients to standard 8-core biopsies (Group A n=109) or biopsies with the number of cores determined according to the Vienna nomogram (Group B n=101). The mean (range) serum PSA was 9,72 (2,7-48) in Group A and 9,43 (2,5-46) in Group B subjects. The mean (range) patient age was 63,2 (40-81) in Group A and 65,74 (45-81) in Group B. The mean (range) prostate volume was 47,81ml (10-183ml) in Group A and 48,16ml (11-142ml) in Group B patients. The mean (range) number of biopsy cores was 10,1 (6-18) in Group B, versus 8 in Group A subjects. Prostate cancer was detected in 43/109 (39,4%) of men in Group A and in 35/101 (34,7%) in Group B (Fisher's exact test p=0.52). The two groups are statistically comparable.
**CONCLUSION:** There does not appear to be a significant advantage in using the Vienna nomogram to determine the number of prostate biopsy cores when compared to a standard 8-core biopsy protocol. The study is ongoing and we aim to include 300 patients before data is published.

## EVALUATION OF OXIDATIVE STRESS BIOMARKERS IN RELATION WITH PSA LEVELS

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**ABSTRACT:** Prostate cancer is a common cause of morbidity and mortality in men. Its etiology has been linked with excessive production of free radicals especially hydroxyl (-OH) radical, which virtually reacts with all cell components including DNA, this results in mutations of DNA.
There is an increasing evidence, indicating the implications of oxidative stress (OS), with the development of premalignant conditions such as high grade prostatic intraepithelial neoplasian (PIN), post inflammatory atrophy (PIA) and progression of prostate cancer. In this preliminary study, we focused on the evaluation of oxidative stress biomarkers in relation with prostatic specific antigen (PSA) levels before investigating the implications of OS in prostatic carcinogenesis.
**METHODS:** Seventy six patients were selected and subdivided in two groups: the first group included patients with PSA ranging from (0-4 µg/L), whereas patients whose PSA exceeds 4 up to 10 µg/L constituted the second group (test group).
PSA was performed using classical method. Lipid Peroxides (LPO) were evaluated using ferrous oxidation with xylenol orange, based on the principle of rapid peroxide – mediated oxidation of $Fe^{2+}$ to $Fe^{3+}$ under acidic conditions. Immunochemical detection of 8-0HdG and 4-HNE was performed using ELISA analyser, with a specific monoclonal anti-8-0HdG and 4-HNE antibodies to investigate the presence of these metabolites.
**RESULTS:** The mean of 8-0HdG (6,097 ng/mL) in the test group (PSA 4-10 ng/L) was significantly higher (p>0,05) than that of the control group (5,327 ng/mL) in contrast the average levels of 4-HNE and LPO which were significantly lower respectively 367,843 µg/mL and 61,029 µM in the test group as compared to the control group.
Positive correlation was observed between LPO and the two biomarkers investigated (8-OHdG and 4-HNE) in control and in test groups.
**CONCLUSION:** These findings suggest that only the DNA adduct (8-OHdG) resulting from direct DNA damage by free radical seems to be involved in prostate mutagenesis and carcinogenesis. Lipid peroxidation appears not to influence the progression of the disease.

## THE RISK OF BLOOD SPLASHES TO THE EYE DURING SURGERY

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**AIM:** With the advent of a new infectious era involving the Human Immunodeficiency Virus (HIV) as well as Hepatitis B and C Viruses, concern about the transmission of these through ocular blood splash injuries during surgery has arisen. The purpose of the study was to determine the risk of ocular blood splash injuries to surgeons and their assistants during surgery.
**METHODS:** Surgeons / assistants in several surgical disciplines were requested to wear face masks containing a transparent plastic visor. The visors were collected at the end of the operation and inspected for macroscopic and microscopic blood splashes.
**RESULTS:** Fifty-nine percent of the surgeons / assistants refused to wear the visor. The incidence of blood splashes in those who participated was 45%. There was a trend for blood splashes to be more common during major surgery and during elective surgery. Surgeons and assistants had a similar risk.
**CONCLUSION:** This study confirms the significant risk of ocular blood splashes during surgery, and suggests a lack of appreciation of the risk by surgeons and assistants.

## CAN ORAL AND CLINICAL EXAMINATIONS BE APPLIED FAIRLY TO STUDENTS IN A SURGICAL DEPARTMENT IN SOUTH AFRICA?

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**AIM:** Oral and long case clinical examinations are inherently subjective, and marks may be unfairly influenced by language difficulties, or if the examiner is biased towards the students' gender or ethnicity. These concerns are of particular relevance in South Africa, with our history of legislated racial discrimination. The purpose of this study was to assess whether there was any evidence of systemic examiner bias in these examinations in our department.

**METHOD:** We reviewed the results of 604 final year students' Surgery examinations at the University of Cape Town from 2003 to 2006. These consisted of a multiple choice paper, an objective structured clinical examination, a long case clinical examination and an oral examination.

Students who spoke English as a home language performed better in all examination modalities.

**RESULTS:** Female students scored slightly better than males overall, but they scored similarly in the clinical and oral examinations. There were significant differences in the marks scored between the various population groups in all examination modalities, with 'White' students achieving the highest scores, and 'African' students the lowest. These differences were most marked in the multiple choice examination, and least marked in the oral and clinical examinations.

**CONCLUSION:** We concluded that although there were differences in the examination results according to gender and ethnicity, these were consistent through the various examination modalities, and could not be explained on the basis of systemic bias in the oral and long case clinical examinations.

## PHARYNGEAL CYSTICERCOSIS: A PREVIOUSLY UNDESCRIBED MANIFESTATION OF A COMMON PARASITE

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**BACKGROUND:** Cysticercosis is a parasitic infection resulting from invasion of human tissue by larval stages of the pork tapeworm Taenia Solium.Neurocysticercosis is the most serious complication and the greatest cause of acquired epilepsy worldwide. Extraneural manifestations occur frequently and organ systems commonly involved include subcutaneous tissue, muscle and orbital contents. Although cysticercosis of the oral cavity is a well recognized manifestation, clinical involvement of other parts of the upper aerodigestive tract is extremely rare with only one case of laryngeal cysticercosis described in the literature. In this paper, we present a rare case of pharyngeal cysticercosis followed by a literature review with emphasis on upper aerodigestive tract involvement by this common parasite.
**METHODS:** An 86-year-old woman with active neurocysticercosis and subcutaneous tissue involvement presented to us with speech difficulty. Otorhinolaryngological examination revealed a mobile cystic mass in the left posterior pharynx. The cyst was excised under general anaesthesia and sent for histopathological examination.
**RESULTS:** A diagnosis of pharyngeal cysticercosis was made on clinical, radiological and histopathological grounds. The patient was successfully managed with surgical excision of the pharyngeal cyst and subsequent chemotherapy using a regime of albendazole and prednisone.
**CONCLUSION:** In this case report, we described an atypical manifestation of cysticercosis in the form or pharyngeal involvement. Diagnosis is usually based on a combination of clinical, radiological and histopathological grounds. Although pharyngeal cysticercosis can be successfully managed by simple excision followed by a regime of albendazole and prednisone, neurocysticercosis and ophthalmic cysticercosis are associated with significant morbidity. It is therefore worth bearing in mind that a simple visible cyst may be a marker of more extensive disease. We also suggest that anatomical location of cysts in the upper aerodigestive tract warrant surgical excision since the risk of airway obstruction and feeding difficulties leading to malnutrition in the long term exist. The occurrence of cysticercosis in pharyngeal tissue adds a new dimension to the manifestation of the disease.

## VASCULAR INJURIES: A REVIEW OF OUR EXPERIENCE AT SEBOKENG HOSPITAL

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**PURPOSE:** The purpose of this study is to evaluate our experience with vascular injuries. We describe demography of injuries, other associated injuries, type of vascular repairs and final outcome.
**METHODS:** A retrospective review of all patients treated for vascular injuries between April 2007 and May 2008.We have identified fourteen patients who underwent vascular repair during that time period.
**RESULTS:** During the 12 month period, 14 vascular injury patients were identified. The average age was 25 years (range 8 – 32 years), all of them male patient. Majority (86%) had penetrating injury versus 14 % blunt trauma. Extremity injury accounted for 7 (50%), with vascular injuries in neck 4(28%) and chest 3 (21%). Of the extremity injuries, 2 occurred in arm and 5 in leg (2 femoral and 3 popliteal).Reverse saphenous graft was used for popliteal and brachial injuries with gortex graftused for femoral injury. Fasciotomy was made in all, mainly for late presentation with tense compartments in the limb.
Associated injuries were seen in 6 (43%), this included femur fractures in 2, pneumothorax, brachial plexus injury and tracheal injury. Perioperative morbidity and mortality were 14% (2 patients) and 7% (1 patient) respectively. There were no limb loss in this study.
**CONCLUSION:** Vascular trauma represented a small percentage of all trauma patients. Extremity injuries continue to predominate with favourable outcome in terms of limb salvage.

## AN ANALYSIS OF 203 PENETRATING NECK INJURIES

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**BACKGROUND:** Selective nonoperative management (SNOM) of penetrating neck injuries has increasingly gained wider acceptance. The purpose of this study was to validate a protocol of SNOM of PNI based on physical examination, which dictates further complementary investigations and management.
**PATIENTS AND METHODS:** A prospective observational study was conducted at the Trauma Center at Groote Schuur Hospital. All consecutive patients surviving penetrating neck injuries over a period of 13 months were included and analysed for demographics, mechanism of injury, success or failure of nonoperative management, indications for surgery, and morbidity and mortality.
**RESULTS:** Two-hundred and three patients were included in the study. There were 159 and 42 patients with stab and gunshot wounds, respectively. A vascular injury was identified in 27 (13.3%) patients, pharyngoesophageal injury in 18 (8.9%) patients and an upper airway injury in 8 (3.9%) patients. Only 25 (12.3%) patients required surgical intervention. A further 8 (3.9%) patients had therapeutic endovascular procedures. The remaining 170 (83.7%) patients were managed expectantly. There were no clinically relevant missed injuries.
**CONCLUSION:** Selective nonoperative management based on clinical examination and selective use of adjunctive investigation studies is safe in a high volume trauma center.

## THE MANAGEMENT OF PENETRATING SUBCLAVIAN ARTERY INJURIES

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**AIM:** The aim of this study was to examine the clinical presentation, injury patterns, surgical management and the outcome of penetrating subclavian artery trauma.
**PATIENTS AND METHODS:** A retrospective chart review of all surgically managed penetrating SA injuries managed in the Trauma Center at Groote Schuur Hospital, Cape Town, from January 1997 to December 2007 was performed. Demographic data, mechanism of injury, associated injuries, angiographic findings, treatment, hospital stay, complications and mortality were noted.
**RESULTS:** Forty-nine patients (mean age 27, range 15-54 years) presented with subclavian artery trauma. The mechanism of injury was a stab wound in 39 (80%) and gunshot wounds in 10 patients (20%). The predominant clinical presentation was a pulse deficit (42%). Pre-operative angiography was obtained in 36 haemodynamically stable patients. A false aneurysm (15) and total occlusion (12) of the artery were the two commonest angiographic findings. A median sternotomy was required in 24 patients and two patients underwent a left antero-lateral thoracotomy for haemorrhage control. A primary repair or resection with anastomosis was possible in 53% of patients. There were two cases of graft sepsis that responded to antibiotic treatment. The limb salvage rate was 100% and there were no deaths.
**CONCLUSION:** Pre-operative angiography in the haemodynamically stable patient is extremely valuable in planning the operative approach. Primary repair of SA injuries was possible in about half of the patients. Incidence of graft sepsis was low. Ligation of subclavian artery injury in critically ill patients was life-saving.

## INFLUENCE OF DIABETES ON SHORT-TERM OUTCOME FOLLOWING FEMORO-POPLITEAL BYPASS.

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**OBJECTIVES:** To assess the influence of diabetes mellitus on early morbidity and mortality following a femoro-popliteal bypass.
**METHOD:** Clinical data on patients subjected to an above knee femoro-popliteal bypass for atherothrombotic disease over a 4 year period on the Durban Metropolitan Vascular Service was culled from a prospectively maintained computerized database.
They were divided into 2 groups, diabetic and non-diabetic.
**RESULTS:** Two hundred and seventeen patient records were analyzed. One hundred and two (47%) were diabetic and 115 (53%) non-diabetic.
There was no significant different in the mean age between the two groups.
Differences noted between the two groups were that there was a higher prevalence of males and cigarette smokers in the non-diabetic group and hypertension among diabetics. The prevalence of ischaemic heart disease among two groups was not statistically significant.
The majority of patients in both groups presented with Critical limb ischaemia.
Overall 208 (96%) of the patients had their procedures performed using loco regional anaesthesia. All patients had an above knee femoro-popliteal bypass using prosthetic grafts.
The incidence of superficial wound infection between the two groups was not statistically significant. Deep infection which necessitated removal of the graft and cardiovascular complications were significantly higher in diabetics.
Four patients (3,9%) in the diabetic group died and only one (0,9%) in the non-diabetics.
**CONCLUSION:** Diabetes mellitus significantly increases the incidence of graft sepsis and that of cardiovascular morbidity in patients undergoing above knee femoropopliteal bypass.