37th Annual Meeting of the Surgical Research Society of Southern Africa

25 - 26 June 2009, Department of Surgery, University of the Witwatersrand

USE OF LOCAL PERFORATOR FLAPS IN PARTIAL MASTECTOMY DEFECTS

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Purpose: To demonstrate various uses of local perforator flaps, mainly lateral intercostal artery perforator (L-ICAP), anterior intercostal artery perforator (A-ICAP), lateral/long thoracic artery perforator (LaTP/LoTP) and thoracodorsal artery perforator (TDAP flaps), for a variety of partial mastectomy defects.

To determine suitability of these flaps as a method of reconstructing partial mastectomy defects in selected patients.

Methodology: All patients who qualified for breast conserving surgery but were not suitable for standard methods (parenchymal flaps or therapeutic mammoplasty) primarily and after neo-adjuvant chemotherapy, were included in the study. Data were collected prospectively over one year from May 2008 to April 2009.

Relevant oncological data, pre-, intra- and postoperative photographs as well as follow-up photographs after completion of radiation therapy were included. The defects were reconstructed immediately in all patients. The choice of flap was determined by the site/size of the defect and the availability of local perforators. This was always confirmed pre-operatively using a Doppler probe.

Modifications were devised to maintain/recreate aesthetic units of the breast.

Results: Sixteen patients fulfilled the criteria for inclusion in the study. Local perforator flaps permitted post-resection reconstruction and breast conservation in all patients. Wide excision margins were possible in all cases. There were 5 minor complications and only one total flap loss. All patients with viable flaps were satisfied with the aesthetic outcome. An independent panel of observers judged the aesthetic results good to excellent in two-thirds of patients.

Conclusion: Local perforator flaps are an extended form of oncoplastic surgery permitting breast conservation in a select group of patients. Their versatility has permitted reconstruction of defects in virtually all breast quadrants. We have found the technique both feasible and acceptable in our centre and have incorporated the technique in our protocol for oncoplastic breast surgery.

ASSESSING THE AXILLARY RECURRENCE RATE IN BREAST CANCER PATIENTS WITH A NEGATIVE SENTINEL LYMPH NODE BIOPSY

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Aim: To assess the development of axillary nodal metastases in patients who had previously undergone a negative sentinel lymph node biopsy for breast cancer.

Methods: We conducted a retrospective review of 133 consecutive patients with early, operable breast cancer who had SLN biopsies between August 2001 and August 2006 at Groote Schuur Hospital, Cape Town, with a minimum follow-up of 2 years. 135 SLN biopsies were assessed. A total of 49 patients were excluded because of the SLN being positive (35), and 14 did not meet the minimum follow-up criteria. A total of 86 patients with negative SLN biopsies were followed up for a median period of 44 months, until they developed metastases or died.

Results: There were no patients with nodal axillary recurrence. 1 patient underwent later axillary clearance for presumed axillary recurrence, but histological examination revealed the tumour to be within the axillary tail of breast and not in any axillary lymph nodes. 2 patients had recurrence in the chest wall below the axillary incision. 7 patients developed distant metastases in liver, bone and lungs without evidence of axillary recurrence. There were 4 cancer-related deaths.

Conclusions: Omitting axillary node clearance after negative sentinel lymph node biopsy appears to be safe.

CLINICAL OUTCOME OF PATIENTS WITH A METASTATIC AXILLARY SENTINEL LYMPH NODE AND NO AXILLARY CLEARANCE

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Aim: To describe the clinical and pathological features of patients who had a false-negative frozen section for sentinel lymph node biopsy for breast cancer, and to document their clinical outcome.

Method: We conducted a retrospective review of 135 SLN performed in 133 consecutive patients with early, operable breast cancer between August 2001 and August 2006 at Groote Schuur Hospital, Cape Town. All patients were followed up for a minimum of 2 years. 14 patients were lost to follow-up and excluded from the analysis. 35 patients had metastatic lymph nodes noted at the time of surgery and underwent a completion axillary clearance. A total of 86 patients had a negative intraoperative SLN analysis.

Results: Eight of these 86 patients were noted to have malignant cells on further histological examination sections. Two patients had isolated tumour cells (metastases <0.2 mm), 5 patients had micrometastases (metastases 0.2 - 2 mm), 1 patient had an 8 mm macrometastasis. None had subsequent axillary clearance, or axillary radiotherapy. None of the patients had axillary recurrence with a mean follow-up of 44 months. Four patients (50%) developed distant metastases within 28 months, and 3 died. Three patients were clinically disease free at 37, 46 and 59 months respectively. One patient was lost to follow-up after 18 months.

Conclusion: Recurrent axillary lymph node disease has not been a clinical problem in this subgroup of patients. Patients with unrecognised metastatic SLN at the time of surgery seem to have a high risk for the development of systemic disease.

MICROINVASION IN DUCTAL CARCINOMA *IN SITU*: PREDICTION AND PROGNOSTICATION

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Background: The relationship between ductal carcinoma *in situ* and invasive breast cancer seems variable, and it is poorly understood. Approximately 30 - 50% of all DCIS progresses to invasive cancer, but few data are available to predict which forms of DCIS will invade and spread.

Methods: Women with a primary diagnosis of ductal carcinoma *in situ* between March 2001 and March 2008 were selected from one practice. Patients with radiological or pathological evidence of invasion prior to operation were excluded. The resulting clinical and pathological data of 104 women managed operatively for DCIS were analysed.

Results: All patients were treated with either mastectomy or wide local excision and radiotherapy. Microinvasion (DCIS-MI) was found in 29 women (27.9%). Patients with microinvasion were more likely to present symptomatically (55 v. 31%) and with large or multi-focal areas of disease.

89 patients (85.6%) had a sentinel lymph node biopsy (SLNB) performed. Positive lymph nodes were found in 4 patients (4.5%), all of whom had microinvasion. This represents 13.7% of DCIS-MI patients. Patients with microinvasion and lymphatic spread were more likely to have HER2neu 3+ tumours (75 v. 28%) than microinvasion alone. Oestrogen receptor status was equal in all groups.

Grading of DCIS did not predict for invasion, or lymphatic spread.

Conclusion: Our results show that there are characteristic differences between pure DCIS and DCIS with microinvasion (DICS-MI). Patients with extensive disease and HER2neu-positive disease are more likely to have microinvasion and significantly more likely to have lymphatic spread. This may represent *de novo* aggressive disease or help us delineate the pathway from 'benign' DCIS to invasive carcinoma.

LARGE-BOWEL CANCER IN JOHANNESBURG

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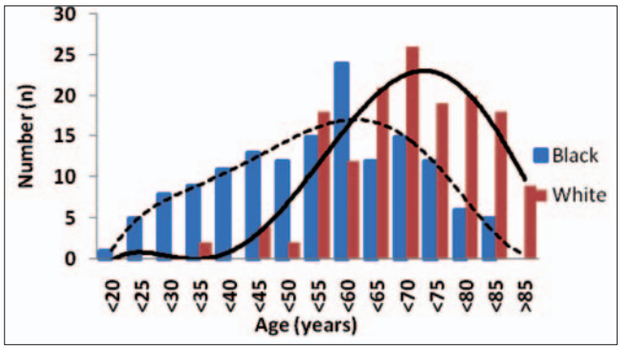
Aim: A retrospective audit of the clinical and epidemiological characteristics of large-bowel cancer at a metropolitan hospital in Johannesburg.
Subjects: A consecutive audit of all cases treated in one unit from 1993 to 2009.
Results: Data were available for 538 patients. The male/female ratio was 1.03:1; there were no differences between genders among blacks and whites; but there was a male preponderance in both coloureds (35:17) and Indians (23:10).
Site: More than two-thirds of cancers occurred in the rectum, in all races, and approximately 80% were found in the rectum and sigmoid, in all patients, *within easy reach of a flexible sigmoidoscope*. There was no evidence of a right-sided incidence in black patients.

	Rectum	Rectum, sigmoid & descending	Transverse	Ascending & caecum
Black	**73%**	**85%**	**2%**	**12%**
White	**67%**	**78%**	**3%**	**19%**
Coloured	**71%**	**83%**	**4%**	**13%**
Indians	**70%**	**79%**	**5%**	**15%**

Age: The shape of the curves was similar among whites (67.2 y ± 12.0 y), coloureds (59.8 y ± 12.6 y) and Indians (57.2 y ± 10.8 y), with very few cases younger than 40 y. There were two important differences among black patients: the mean age was younger (52.6 y ± 15.6 y); and over 20% of the patients were under 40 y. (Differences between blacks and whites highly significant: $p<0.0001$).
Rectum: There were 280 patients with cancer of the rectum. 70 patients were not operated on, owing either to their choice, or the presence of extensive metastases; 19 received a colostomy alone for diversion of obstruction in the presence of metastases; in 16, resection was abandoned despite prior down-staging radiotherapy (45 Gy) because of locally advanced disease. In the remaining 175, sphincter-saving surgery (AR or LAR) was possible in 56%, and abdomino-perineal resection was necessary in 46%, when the tumour was less than 2 cm from the sphincters.

139/216 (64%) of patients with rectal cancer presented with T4 disease on imaging or exploration. These all received pre-operative down-staging chemo-radiotherapy (45 - 54 Gy).
Conclusions: Large-bowel cancer is a major health problem in all members of SA society; 80% of the cancers can be detected by sigmoidoscopy; there is a disproportionate number of cases in young black patients; there is no right-sided preponderance in blacks; and nearly two-thirds of cases are T4 at presentation.



BREAST SELF-EXAMINATION IS A GOOD SCREENING TEST FOR BREAST ABNORMALITIES IN SOUTH AFRICA

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Introduction: National breast cancer screening guidelines are increasingly being based on screening mammography as the method of choice, to the extent that some guidelines do not recommend breast self-examination (BSE) at all. We investigated whether or not BSE is a good screening test, and in the absence of a national screening programme whether or not it should be advocated for as the screening tool of choice in South Africa.
Methods: During the month of August 2008 our multilingual breast health care nurses interviewed all new attendees at our breast clinic in a government hospital, and filled in an anonymous questionnaire on their behalf during the interview. The questionnaire contained demographic information and medical information which included the patient's perception and practice of BSE, as well as their understanding of breast cancer. The aim of the questionnaire was to determine awareness of breast self-examination and the reason for attending our clinic, as well as awareness of breast cancer and breast screening.
Results: A total of 177 patients attended our clinic for the first time during August 2008. Our questionnaire showed that 59% of patients (104/177) were aware of BSE, and that 54% practised regular BSE. All 177 patients went on to have radiological imaging of their breasts. A total of 48 biopsies were performed, with 21 being malignant.

If we consider the outcome of BSE to be the diagnosis of a lump rather than carcinoma, it becomes an excellent screening test, with a sensitivity of 100% in our series.
Conclusions: BSE should be incorporated into a national breast screening programme. A breast awareness campaign should focus on encouraging women to seek medical help should they notice a change in their breasts, which includes the finding of a mass, nipple discharge, or atypical pain.

SYSTEM DELAYS IN THE MANAGEMENT OF MALIGNANT BREAST DISEASE AT A REGIONAL HOSPITAL IN KWAZULU-NATAL

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Introduction: Breast cancer is the most common cancer in women worldwide. In our health system the disease first comes to the attention of the general surgeon, who confirms the diagnosis and commences initial work-up. A delay was noted in this process at a regional (secondary level) hospital in Durban, KwaZulu Natal.
Aim: The primary aim of the study was to document the total time delay from initial presentation at a secondary level hospital to initial assessment at the specialised breast clinic, and to compare this with accepted international standards. Secondary aims included specific care step delays and reasons for these delays.
Patients and methods: All patients with histologically proven breast malignancy seen as outpatients at R. K. Khan Hospital from January 2008 to April 2009 were eligible for the study. The data were collected retrospectively and included age, gender and the following data: clinical assessment, breast imaging, histological diagnosis, metastatic screening, and visit to specialised clinic. Patients admitted for work-up were excluded as the delays were inherently shorter.
Results: Forty patients fulfilled the inclusion criteria. The majority were female and the average age was 55.8 years. The table documents the specific care steps and the average delay in consecutive days for each care step.

Care steps	Average delay in days
Delay 1: Clinical assessment to imaging	**18.3**
Delay 2: Histological diagnosis	**21.2**
Delay 3: Metastatic screening	**9.2**
Delay 4: Specialised clinic	**22.7**
Total delay	**70.1 (range 32 - 199 days)**

Conclusion: The average delay of 70 days falls far short of the acceptable published international guidelines. Main reasons for delays were overwhelmed state facilities, clinician inexperience and administrative bungles. These results have guided practical policy changes to improve service delivery at a regional level.

TUBERCULOSIS AND THE BREAST IN THE HIV ERA: THE CUP RUNNETH OVER?

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Introduction: Tuberculosis is a worldwide problem with a high incidence in developing countries. Mammary tuberculosis is a rare form of tuberculosis. The marked upward trend in new TB cases notification rates in South Africa reflects the impact of HIV. With the incidence of tuberculosis increasing, an increase in extra-pulmonary involvement can be expected.
Aim: The primary aim of the study was to ascertain whether there was an increased incidence of breast involvement secondary to tuberculosis in the HIV pandemic. Secondary aims were to highlight the spectrum of presentation and outcomes (recurrence and death) of tuberculosis affecting the breast.
Patients and methods: The study was conducted from April 2000 to March 2009 at the Breast Unit. The files of all patients with a diagnosis of tuberculosis involving the breast were extracted from the Breast database and reviewed retrospectively.

Clinical presentation, diagnostic modality, primary or secondary involvement, HIV status, treatment and outcome were documented. The number of cases per year was also noted.
Results: Thirty-one patients presented with tuberculosis affecting the breast over the 9-year period. No increasing trend was observed over the study period.

Twenty-one patients presented with classic mammary tuberculosis; the most common presenting form was the disseminated pattern. All patients, except

one, were female and the average age was 37 years. The pathology was primary in 22 patients. Fifty-three per cent were HIV positive. In the majority (94%) the diagnosis was made on histopathological assessment of the breast mass or the axillary node. Of the 29 patients treated, the pathology resolved in 18 patients. Twelve of these patients completed the full course of treatment, and of these 10 were followed up from between 6 months to 4 years. Two nodal recurrences occurred. Four patients are still on treatment. Of the 15 patients lost to follow-up, 2 never commenced treatment, and 1 patient has died of AIDS.
Conclusion: Although tuberculosis is rampant in SA and the incidence is rising as a result of AIDS, we have not observed an increase in the incidence of breast involvement at the Breast Clinic. In our setting tuberculous breast involvement has protean manifestations and frequently mimics locally advanced breast cancer. It is the only benign breast condition where medical treatment is effective.

A REVIEW OF 33 HIV-POSITIVE PATIENTS WITH BREAST CANCER

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Introduction: The management of non-AIDS-defining cancers in HIV-positive patients pose questions of standard cancer treatment algorithms.
Aim: The primary aim of this study was to analyse our experience with breast cancers in HIV-positive patients treated in a dedicated breast oncology unit, to formulate more evidence-based guidelines.

A secondary aim is to determine whether there is an association between HIV and breast cancer, in particular ductal carcinoma *in situ* (DCIS).
Patients and methods: This retrospective study was conducted from 2002 to 2009 at the Addington Hospital Breast Clinic. All patients with breast cancer and concurrent HIV infection were eligible. HIV testing was selective prior to June 2008, and mandatory thereafter as part of the multidisciplinary clinic protocol. Age, stage of presentation, histological sub-type and CD4 counts were entered into a database.
Results: A total of 33 HIV-positive patients with breast cancer were identified. This constituted 4.2% of all breast cancers over the study period. Sixteen patients were identified prior to June 2008. All the patients were of black African ethnicity. The average age was 40.3 years (range 24 - 70 years). The average age of non-HIV-positive breast cancer patients was 56.4 years.

In 28 patients the tumour stage was documented: Tis – 3% (1), T1 – 7% (2), T2 – 25% (7), T3 – 11% (3), T4 – 54% (15). Seven patients presented with metastatic disease, all had T4 lesions. One patient had a metastatic recurrence after 3 years and died of PCP pneumonia 1 year later. Two patients had bilateral breast cancers.

The most common histology was infiltrating ductal carcinoma (IDC) (30). Twelve of these patients (40%) had associated DCIS.

The average CD4 count in 22 patients was 456 (range 88 - 1 309). In 5 of these patients the CD4 count was <200. Seven patients had their CD4 counts repeated while on treatment; 5 demonstrated a decrease.
Conclusion: Our study revealed that HIV-positive breast cancer patients form a small but not insignificant cohort of all breast cancers seen at our centre. These patients are younger; more commonly present with advanced disease (55%) requiring neo-adjuvant chemotherapy, and manifest a decrease of their CD4 count on chemotherapy. The high incidence of associated DCIS (40%) warrants further research to elucidate its role in terms of cause or effect.

RESPONSE TO DOCETAXEL- OR ANTHRACYCLINE-BASED PRIMARY SYSTEMIC CHEMOTHERAPY REGIMENS FOR LOCALLY ADVANCED OR EARLY STAGE OPERABLE BREAST CANCER

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Background: Docetaxel has proven efficacy in breast cancer patients. There are numerous adjuvant, neo-adjuvant and metastatic trials in which the benefit has been clearly documented.
Aim: A retrospective study designed to evaluate the effect of docetaxel given as primary systemic chemotherapy to South African patients treated in a community-based multi-disciplinary breast cancer practice.
Objectives: The primary objective of this retrospective analysis is to describe the rate of pCR following docetaxel- or anthracycline-containing chemotherapy for early-stage operable or locally advanced breast cancer. The secondary objectives are to identify predictive factors for pCR and quantifying the predictive potential of factors identified.
Methods: The analysis was conducted on all patients seen with breast cancer from January 2001 to April 2008 and deemed eligible for primary systemic chemotherapy by the treating physician. All data from the initial visit, chemotherapy treatment and subsequent surgery were collected. Incomplete data and patient records not in accordance with the specified inclusion and exclusion criteria as per protocol were not considered for the final analysis. The exclusion criteria included male breast cancer, metastatic breast cancer, bilateral breast cancer, Paget's disease, previous surgery with intent of debulking and patients receiving drugs not specified in the protocol. Patients with ductal or lobular breast cancer receiving neo-adjuvant anthracycline- or docetaxel-containing regimens were included in this study. Taxotere-containing regimens consisted of TAC, FAC-T, AC-T. Anthracycline-containing regimens were limited to FAC and AC. pCR was defined as no residual invasive disease in the breast and axilla on final pathological assessment of surgical specimens. Regression analysis was used to determine the pCR predictive value of a predefined set of criteria as listed below: tumour size, lymphovascular invasion, nuclear grade, nodal status, ER, PR and Her-2-neu status and menopausal status.
Results: Of a total of 250 records collected 166 were eligible for this analysis. 83 patients received docetaxel-containing regimens and 83 anthracycline-based regimens. The pCR rate for patients receiving docetaxel was 19.3% and 12% for those receiving anthracycline-based chemotherapy. Oestrogen status was found to be a significant predictor of pCR ($p<0.05$). There is a 14.6% better chance of achieving pCR when a patient is ER- (34.62%) compared to (20%) when a patient is ER+. There was a trend towards increased pCR rates in patients who have a higher nuclear grade (grade 1: 0%; grade 2: 11.75%; grade 3: 33.3%).
Conclusion: Of all the factors analysed the only statistically significant predictive factor for complete pCR in this cohort of patients was ER status. Docetaxel-containing regimens produced a pCR rate of 19.3% whereas the anthracycline-based group achieved a 12% pCR rate. A prospective trial is being planned to assess the difference between pCR rate in anthracycline and different taxane-based regimens as this study was underpowered to detect such differences.

Sanofi-Aventis made a financial contribution.

EARLY EXPERIENCE WITH STENT-GRAFTS FOR THE TREATMENT OF THORACIC AORTIC INJURIES: LESSONS LEARNED

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The treatment of traumatic thoracic aortic ruptures with stent-grafts is currently reported to be an effective and safe procedure. This minimally invasive procedure is appealing in patients with multiple severe injuries. The aim of this study was to analyse the role and limitations of endografts in all thoracic aortic injuries.
Methods: Between April 2004 and May 2008 we treated 29 patients with thoracic aortic injuries. There were 25 aortic transections, just distal to the left subclavian artery (all as a result of motor vehicle accidents) and 4 descending thoracic aortic injuries (a gunshot-related false aneurysm at T11, an orthopaedic-related iatrogenic false aneurysm at T9 and two MVA-related dissections at T8 and T9 respectively). Injuries were assessed pre-operatively with computed tomographic scans and intra-operatively with aortography. CT scans were planned before discharge from hospital, at 6 months, 12 months and annually thereafter.
Results: Technical success was 100% and intra-operative imaging revealed sealing of the injured site in all cases. Adverse events included:
- Graft oversizing by 36% (arch injuries)
- Poor graft apposition to the arch (4 patients)
- Renal failure (2 patients)
- Injury-related mortality (5 patients)
- Lower limb thrombo-embolism (1 patient)
- Lost to follow-up (6 patients)
- Left subclavian artery coverage (14 patients, 3 with severe head injuries)

Conclusion: Stent-grafts appear safe and effective in treating thoracic aortic injuries; however, specific adverse events are associated with the procedure or the severity of the injury. This mandates the development of meticulous radiological and procedural protocols.

THE PREVALENCE OF THE METABOLIC SYNDROME IN MEN PRESENTING WITH ERECTILE DYSFUNCTION AT A SOUTH AFRICAN TERTIARY CARE CENTRE

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The metabolic syndrome (MS) has recently become one of the major public health challenges and results from the increasing prevalence of obesity. MS is characterised by lipid storage abnormalities, insulin resistance, hypertension, glucose intolerance and central obesity, and overt diabetes (type 2) or atherosclerosis develops over time. Erectile dysfunction (ED) affects up to half of men over the age of 40. It is estimated that by the year 2025, 322 million males will be affected by ED, and that the largest increase will be in the developing world: Africa, Asia and South America. Men with co-morbid disease and risk factors including cardiovascular disease, hypertension, dyslipidaemia and depression all report a higher prevalence of ED. It is postulated that an association between ED and MS exists as four of the five components of MS are risk factors for ED.

The current study investigated the prevalence of MS in 100 men with ED presenting to the Male Sexual Dysfunction Clinic at the Johannesburg Hospital. Men over 30 with spontaneous-onset ED and no prior pelvic surgery, trauma or radiation were invited to participate (anonymously with informed consent). Participants underwent a thorough history taking and examination session which included the International Index of Erectile Function Score. Several fasting biochemistry and hormonal tests were performed. The IDF Consensus Group new worldwide definition of MS was used in the current study. Participants were divided by race into three groups which approximate current population statistics (black 61%; white 15%; other (comprising mostly people of Asian descent) 24%). Data were recorded in EXCEL and reported as mean ± SD or as a number (frequency). Where applicable, correlation between variables was determined.

The prevalence of MS was 39%, with the highest prevalence (54%) in the 'other' group. The black participants showed the lowest prevalence of MS at 33%. Eighty per cent of participants had moderate-severe ED, with a mean duration of 3.8 years. Glucose and HbA1c were strong predictors of ED duration, and these parameters would be part of the initial diagnostic work-up for men presenting with ED worldwide. Severity of ED was not influenced by the presence of MS. Hypogonadism (testosterone <12 nmol/l) was present in 37 participants, while 17 (44%) men with MS were hypogonadal. Of interest, 8 (21%) participants with MS had no prior history of chronic illnesses or chronic medications, suggesting that MS can be completely asymptomatic. Men presenting with ED may represent an ideal patient group to screen for MS, and therefore for cardiovascular disease, especially for those men within the asymptomatic period.

APPRAISAL OF THE FINAL-YEAR MB BCH ASSESSMENT IN GENERAL SURGERY AT THE UNIVERSITY OF THE WITWATERSRAND

M. Veller

On behalf of the Department of Surgery, University of the Witwatersrand

A graduate-entry, outcomes-based and integrated curriculum (the GEMP) was introduced for medical students at the University of the Witwatersrand in 2003. With this change the Department of Surgery introduced changes to the final-year (GEMP4) assessment in general surgery, in order to improve on the validity and accuracy of this examination and to introduce computer-based assessment methods. The aim was to develop an assessment that evaluated attitude and behaviour, theory, clinical skills and clinical decision making. For this reason the assessment consists of a ward mark (10%), a mark for a case summary (10%), a MCQ (30%), a summative assessment of clinical skills (SACS – which is a computer-based clinical scenario – 20%) and three clinical cases (each evaluated using a standardised format – 10% each). The ward and case summary mark are combined to make up the block mark. As this is an outcomes based assessment the pass mark for all aspects is set at 60%.

Aim: To evaluate the reproducibility, value and validity of the components of the GEMP4 final assessments in the first years of the new curriculum.

Method: Between March 2006 and November 2008, 645 students were evaluated (69 on 2 occasions). Data collected in an Excel spreadsheet were evaluated using standard parametric methods.

Results: 91.5% of students passed the examination on the first attempt and a further 8.4% on their second attempt. Only 1.8% achieved a final mark greater than 80%. The statistics for each of the assessment components is:

	Ward	Case report	Block mark	MCQ	SACS	Clinical	Final mark
Mean	**83.66**	**80.75**	**81.87**	**60.22**	**65.59**	**70.22**	**68.44**
Min.	**57.50**	**45.00**	**50.00**	**39.00**	**29.37**	**24.00**	**51.74**
Max.	**100.00**	**100.00**	**97.50**	**84.00**	**96.00**	**100.00**	**83.54**
SD	**7.80**	**9.25**	**7.42**	**7.52**	**10.46**	**9.14**	**5.42**
Skew	**-0.79**	**-0.40**	**-0.71**	**-0.04**	**-0.15**	**-0.11**	**-0.12**
Median	**85.00**	**80.00**	**82.50**	**60.00**	**66.00**	**70.00**	**68.54**

The correlation between the components of the block mark and the final mark was poor (r<0.5) while the MCQ, SACS and clinical marks correlated well with the final mark (r 0.78, 0.72 and 0.69 respectively). The correlation between the MCQ, the SACS and the clinical marks was poor (r<0.5). The block mark has increased between 2006 and 2008 by approximately 4% while the other components varied by less than 1.5% year on year.

Conclusions: The following conclusions have been made:

• The block mark and in particular the ward mark does not help predict the final mark. In addition, the distribution is not Gaussian and therefore must be removed from evaluating student performance.

• The MCQ, SACS and clinicals test different aspects of student skills. These tools are able to discriminate, are repeatable and appear to be valid for the purpose for which they are being used.

• Identification of those students performing well must be improved.

EFFECTIVENESS OF PROCTORSHIP FOR REGISTRARS IN LAPAROSCOPIC SURGERY IN A NON-TERTIARY HOSPITAL – IS IT DOABLE?

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Introduction: In the face of severe resource constraints and an ever-increasing demand for high-quality surgical specialists in South Africa, it has become necessary to train registrars sometimes outside the usual comfort of the academic teaching hospitals. Theatres are overburdened in the public sector and there are inadequate opportunities and time to supervise trainees in laparoscopic procedures. Moreover, surrogate models such as simulators, cadavers and animals are also not easily available for training registrars. Thus, non-tertiary hospitals are providing the extra space to train registrars using real clinical cases under strict and direct supervision.

Registrars posted to Sebokeng Hospital have had a unique opportunity of being trained in and getting a fair amount of experience in laparoscopic surgery.

Aim: To evaluate the efficacy of a mentorship programme in laparoscopic surgery in a non-tertiary environment.

Patients and methods: We reviewed the records and theatre register of all laparoscopic cholecystectomies that were performed from February 2008 to January 2009. This was compared with a similar period in the previous year (February 2007 to January 2008) during which all such procedures were performed by the resident consultants.

The total number of laparoscopic cholecystectomies for 2007 - 2008 was 46 (f = 43, m = 3) and for 2008 – 2009, 81 (f = 77, m = 4). 14 (17.2%) cases were operated by or taken over by consultants. 63 (82.7%) were performed by the registrars under the direct supervision of a consultant. Among these, there was 1 (1.2%) major bile duct injury, 6 (7.4%) stump leaks and 4 (4.93) leaks from the gallbladder bed. All the stump leaks were treated with stents. Other results were 3 converted, 0 mortalities. We also looked at operating time, complication rates, length of stay, and conversion rate between the two years. There was no significant difference in these parameters between the two years.

Conclusion: Proctorship of registrars in minimal access surgery is feasible in level two hospitals provided there is patient and dedicated supervision.

HEPATIC DUCTAL ANATOMY: A CADAVERIC X-RAY STUDY IN YOUNG ADULT AFRICAN MALES

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Hepatic ductal anatomy demonstrates great variation and is relevant to the safe performance of liver surgery. These variations are well described in the classical literature. This prospective descriptive cohort study aims to describe for the first time the variations in hepatic anatomy in African males.

Methodology: 100 fresh cadaveric specimens of the second pathological dissection block were removed from the bodies of trauma victims undergoing medico-legal post-mortem. Cholangiography was performed via the major papilla. A transfixion suture prevented spillage of contrast material with the needle serving as a marker for the major papilla. Stapling clips were used as markers at key anatomical intervals. Two to four radiographs were taken.

Results: 109 specimens were obtained between August 2008 and January 2009. Cholangiography was successfully performed in 104 cases. Both the left and right systems were observed in 88 cases and in 5 cases only the left system was imaged. The tables below describe the confluence variations and hepatic segmental variations according to Healy and Schroy (1953).

RESULTS: HEPATIC SEGMENTAL VARIATIONS

Type	5 *N* (%)	QN%	6 *N* (%)	QN%	8 *N* (%)	QN%	4 *N* (%)	QN%
a	**78 (95)**	**91**	**69 (90)**	**86**	**77 (95)**	**80**	**74 (80)**	**67**
b	**1 (1)**	**5**	**3 (4)**	**10**	**3 (3)**	**20**	**1 (1)**	**1**
c	**-**	**-**	**-**	**-**	**-**	**-**	**2 (2)**	**1**
d	**1 (1)**	**4**	**-**	**2**	**-**	**-**	**11 (12)**	**25**
e	**1 (1)**	**-**	**1 (1)**	**2**	**-**	**-**	**1 (1)**	**1**
f	**-**	**-**	**-**	**-**	**-**	**-**	**0**	**1**
g	**-**	**-**	**-**	**-**	**-**	**-**	**1 (1)**	**1**
n/d	**1 (1)**							
n/d			**1 (1)**		**1 (1)**			
n/d			**1 (1)**					
Total	**82**		**77**		**81**		**92**	

CONFLUENCE CLASSIFICATION

Type	*N* (%)	QN%
a	**58 (61)**	**57**
b	**13 (14)**	**12**
c	**17 (18)**	**20**
d1	**2 (2)**	**5**
d2	**1 (1)**	**1**
e	**1 (1)**	**3**
f	**0**	**2**
Total	**94**	

QN% = quoted norm %; n/d = not previously described.

Discussion: Ductal anatomy of the confluence corresponds with described literature. Marked variation was noted in segment 8 and subsets (a) and (d) of segment 4. Newly described variations were noted in segments 5, 6 and 8.

PANCREATIC DUCTAL ANATOMY: A CADAVERIC X-RAY STUDY IN YOUNG ADULT AFRICAN MALES

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Congenital anomalies are rare and may be pathological. Some of these anomalies produce clinical syndromes while others are of no clinical relevance. The study describes for the first time ductal anatomy in young African males.

Methodology: 100 fresh cadaveric specimens of the second pathological block of dissection were removed *en bloc* from the bodies of trauma victims undergoing medico-legal post-mortem. The tail of the pancreas was transected approximately 2 cm from its termination, cannulated and flushed with water. The ejection of fluid was noted at the major papilla and at the minor papilla. An absence of fluid ejecting from the minor papilla diagnosed a pancreas divisum. Stapling clips were used as markers at the minor papilla, at the superior margin of the first part of the duodenum, encircling the cystic duct and at the perceived bifurcation of the biliary tree. The common bile duct was cannulated via the major papilla. Contrast material was separately injected into the pancreatic duct and the biliary system. A transfixion suture prevented spillage of contrast material and served as a marker for the major papilla. Two to four radiographs were taken. In the case of a pancreas divisum specific injection into the major papilla was performed and a further one or two radiographs were taken.

Results: 110 patients were recruited from August 2008 until January 2009. The pancreas was cannulated in 105 cases, with 93 cases of good quality. Secondary ducts were noted in 23 patients. Pancreas divisum was observed in 4 patients. In 20 patients the pancreatic ductal junction (PDJ) was not adequately observed for assessment. A short common junction was noted in 50 patients and an ultra-short system in 27. None fulfilled the criteria for a long system. The longest length was 12 mm. There were no cases of annular pancreas or radiographic evidence of chronic pancreatitis.

Discussion: The prevalence of pancreas divisum in our cohort was 3.6%, which was at the lower end of the reported incidence quoted in the literature (2 - 12%). The prevalence of a patent accessory pancreatic duct was 23% as opposed to 26 - 41% as described in the literature. The PDJ was well visualised in the majority of cases. The incidence of annular pancreas is too low to have expected any cases. This study outlines the fairly low prevalence of common pancreatic anomalies.

ANATOMICAL CONSIDERATIONS ON SUDECK'S CRITICAL POINT AND ITS RELEVANCE TO COLORECTAL SURGERY

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Sudeck's critical point at the rectosigmoid junction is described as the point of origin of the last sigmoid arterial branch, originating from the inferior mesenteric artery (IMA). There is controversy on the importance of Sudeck's point, and the frequency in which the anastomosis is found. Furthermore, the diameter of the anastomosis, if present, may also impact on the viability of the caudal stump. This study aimed to determine the frequency in which a macroscopic anastomosis occurs, between the superior rectal artery and the last sigmoidal branch, in a cadaver population; the diameter of this anastomosis and the distance from the origin of the IMA to Sudeck's point.

Sixty-four cadavers were included in the study, excluding those with previous surgery to the recto-sigmoid junction. Sudeck's point was carefully identified and dissected to establish the presence of an anastomosis. Subsequent measurements were performed using a digital caliper (accuracy ¼ 0.01 mm). A macroscopic anastomosis was absent in 3 cases (4.7%). The mean diameter of the anastomosis when present was 1.9 mm (SD 0.5 mm), and the distance from the origin of the IMA to Sudeck's point was 55.5 mm (SD 14.6 mm). Although an anastomosis is present in the majority of cases, the vessel is very small in diameter, and may not be sufficient to meet the demands of the caudal stump. The distance from the origin of the IMA to Sudeck's point is sufficient enough to allow for ligation of the IMA proximal to Sudeck's point.

WOUND HEALING EFFICACY OF INDIGENOUS PLANTS

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Introduction: Indigenous plants have been used by traditional healers for a variety of remedies, some with little scientific basis, and are sometimes associated with toxicity. We investigated one such plant which is anecdotally reported to improve wound healing but there have been reports of hepatotoxicity from this plant. There is nothing reported on the active ingredients of this particular species. A pilot study was set up to determine the wound healing efficacy in 3 pigs.

Methods: The animals were anaesthetised and ten 2.5 cm x 2.5 cm square sections of skin, spaced 4 cm from each other, on either side of the spine were removed using a dermatome set to 800 µm. The surgery was performed by a single surgeon. The plant preparation or partially purified compounds, i.e. plant extracts or isolated compounds, was applied to the fresh wounds and covered by a sterile occlusive dressing to trap the wound fluid. Treated wounds alternated with control wounds covered only with the occlusive dressing. A stocking was placed over the initial dressings to hold them in place and the animal was housed separately in the animal unit. Wound healing was assessed visually as well as by biopsy for histology. Wound fluid was analysed for cytokine concentrations and the liver of one animal was sent for pathological examination for possible hepatotoxicity caused by this plant.

Results: Gross assessment of the wounds from all 3 pigs showed improved and rapid wound healing within 5 days compared to 7+ days in the untreated control wound covered with Opsite or Opsite + activated charcoal. Histologically the rate of wound healing was measured as a ratio of dermal layer growth between treated and control wounds. The treated wounds showed complete re-epithelialisation by day 5 postoperatively. Some liver enzymes were raised, but pathological examination showed no sign of the described hepatotoxicity.

Conclusion

a) Partial-thickness wounds were created in a pig model to assess efficacy of plant extracts.
b) The plant preparation, as well as aqueous and methanol extracts of the plant showed on superficial examination, in the 3 pilot pigs showed rapid healing within 5 days compared with approximately 7 days in the control wounds covered with Opsite.
c) Microscopic histological examination showed that this healing was associated with re-epithelialisation of the wound area, whereas this was slower in the control wounds.
d) Although blood sampling on 2 of the 3 pigs showed some elevations in liver enzymes, pathological examination of one liver showed no signs of toxicity.
e) The active compounds remain to be determined.

EVALUATION OF THE EFFICACY AND SAFETY OF FLAVONIX (A NEW LIQUID GEL) IN DEEP PARTIAL-THICKNESS WOUNDS

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Introduction: Wound healing, being a complex and integrated process, can only be modulated by influencing multiple factors simultaneously. Inflammation is the balancing act between pro-inflammatory and anti-inflammatory, local and systemic factors, which result in anything from a healed wound to a chronic recalcitrant wound. Flavonix is an interactive gel containing plant extracts among which baicalein, oleuropein (anti-inflammatory), farnesol and xylitol (anti-bacterial and effective against biofim) are the main ingredients. The plant extracts used have all been evaluated individually in studies. Our aim is to show the efficacy and relative safety of this compound gel in an animal model comparing it with a currently used gel (Intrasite (Smith and Nephew)).

Methods: Pig models were used for the creation of deep partial thickness wounds using a dermatome. The wounds were grouped as follows: 4 wounds were used as controls, 4 were covered with Intrasite gel and 4 were covered with Flavonix gel. All the wounds required a Tegaderm secondary dressing. Control biopsies were taken from a remote site as a relative comparison in each of the 3 pigs. At days 2, 4 and 7 wound punch biopsies and fluid samples were taken from the wounds. Each time the entire dressings were changed and the wounds dressed as previously described. Wound fluid extracted from the absorbent Tegaderm using centrifugation was evaluated by flow cytometry for interleukins and matrix metalloproteinases. 4 mm punch biopsies taken from the wounds were evaluated for fibroblasts, collagen, keratinocytes and percentage re-epithelialisation. Photographic documentation of the wounds was also performed throughout the duration of the study.

Results: Clinically, the wounds dressed with Flavonix and Intrasite gel healed equally well. Control wounds also healed well by days 7 - 10. As animal wound models (such as in pigs) show rapid wound healing in most situations, the quantitative analysis will provide more clues as to the efficacy of the Flavonix gel. No clinically untoward reactions, local or systemic, were noted from the use of the Flavonix gel.

RECONSTRUCTION IN WOMEN OVER 70: A DESCRIPTIVE ANALYSIS OF PRESENTATION AND CHARACTERISTICS

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Background: Women aged over 70 diagnosed with breast cancer are often offered breast cancer treatment that is not current recommended practice. Today more and more data are available recommending identical standard of care for women over 70. Issues are no longer around standard of care but the woman's biological age rather than her chronological age. Reconstruction in women over 70 has not been studied before.

Methods: 100 women over 70 in a practice of 3 728 breast cancer patients underwent immediate reconstruction. Parenchymal flaps, reduction pattern reconstructions, expander prosthesis, prosthesis and latissimus flaps were the types of reconstructions done. All women were counselled and elected to undergo reconstruction. All women had a pre-operative anaesthetic assessment.

Results: Length of hospital stay remained within the range of patients under 70 in the same unit. The rate of complications was less than in the under-70s.

Conclusions: Onco-reconstructive surgery in patients over 70 should not be avoided on the basis of concerns regarding increased length of hospital stay and increased complication rates.

A HOSPITAL-CENTRED BREAST HEALTH AWARENESS CAMPAIGN CAN FORM THE FOUNDATION OF A NATIONAL BREAST SCREENING PROGRAMME IN SOUTH AFRICA

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Introduction: Organised mammogram breast screening programmes result in favourable stage shifting and better prognostic factors than opportunistic screening, but in South Africa an organised programme does not exist. The medical profession is forced to seek alternative ways of educating patients about breast awareness so that patients will take co-responsibility for their own breast health.
Method: We performed an anonymous audit of a breast health awareness campaign performed in a private hospital which included permanently employed female health care workers. They were questioned regarding their breast self-examination perceptions and practices.
Results: A total of 219 out of a possible 360 (61%) health care workers were included in our audit. With regard to the practice of BSE, 86% knew how to examine their breasts, and 81% regularly performed BSE. Five women were diagnosed with breast cancer through this campaign, 3 with early cancer.
Conclusions: A hospital-centred breast health awareness campaign can be very successful and cost effective in educating staff and patients about breast health issues. In South Africa this should be seen as the beginning of a national breast health awareness campaign.

DOES HIV INFLUENCE THE COMPLICATIONS AND IMMEDIATE OUTCOME IN PATIENTS WITH BREAST CANCER RECEIVING SURGERY, CHEMOTHERAPY AND RADIOTHERAPY?

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The effect of HIV on patients with breast cancer is uncertain. A literature review has shown that very little is known about this topic. Only a few small retrospective studies and case reports have been reported on this matter and the results are contradictory. Some suggest that HIV infection renders protection against breast cancer because the incidence of breast cancer in the HIV-positive population is less than that of the general population, if corrected for age and race. Others suggest that breast cancer in HIV-infected patients is more aggressive and occurs at an earlier age. Case studies also suggest that chemotherapy in HIV-infected patients carries an increased risk owing to the patients' already suppressed immunity.

A prospective cohort study has been designed to investigate short-term complications following surgery, chemotherapy and radiotherapy in patients with breast cancer. This study compares these aspects in HIV-positive and HIV-negative patients. The hypothesis is that if the HIV-positive group has more complications after a certain treatment modality than the HIV-negative group, the treatment strategy for HIV-positive patients with breast cancer has to be revised. Patients diagnosed with breast cancer have been invited to participate in the study. All participants have been tested for HIV infection and sorted into the HIV-negative control group or the HIV-positive group. All patients have been managed according to standard of practice guidelines and have been followed up to detect any complications.

A total of 50 patients with breast cancer have been enrolled in the study, 6 of whom are HIV positive and 44 of whom are HIV negative. Early results show that there is no difference in the rate of complications between the control group and the study group. This suggests that HIV-infected patients should be managed according to standard guidelines.

PAGET'S DISEASE OF THE NIPPLE: DANGER POINTS IN DIAGNOSIS AND TREATMENT

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Background: Paget's disease of the nipple is characterised by an eczematous or bleeding nipple associated with underlying carcinomatous cells. The literature describes it as most commonly found in postmenopausal women with underlying DCIS. We examine the prevalence and characteristics of Paget's disease in our practice.
Methods: A retrospective records review identified female patients with a diagnosis of Paget's disease of the nipple from 2002 to 2008. Clinical and pathological characteristics were analysed, including patients' presenting features, time to diagnosis, and final underlying pathology.
Results: Twelve patients with a primary diagnosis of Paget's disease were identified over 5 years. All were treated with mastectomy (9 unilateral, 2 bilateral at patient request for unilateral disease, 1 bilateral for bilateral disease).

Time to presentation was recorded in 6/10 patients presenting with nipple symptoms. Two patients presented with a mass. The median time to presentation was 1 year (3 months to 3 years) and the longest duration to diagnosis was in premenopausal women. Our youngest patient was 24 years old with 3-year duration of symptoms.

The underlying pathology was primary invasive ductal carcinoma in 11/12 patients (91.7%). Lymph node staging was done routinely at primary operation in all cases, either by sentinel node biopsy or by sampling. One patient (8.3%) had involved nodes.
Conclusions: Our review of patient presentation and progression of Paget's disease shows very different characteristics to those recorded in other series. Our patients tend to be more variable in age, menopausal status and symptoms. In other series invasive carcinoma is present in 25 - 40% of patients, whereas we found it in more than 90%. This may reflect diagnosis at a later stage of disease progression, owing to late presentation or late diagnosis by medical practitioners not expecting malignant disease in a younger age group. Based on these results we would recommend axillary staging in patients presenting with Paget's disease, and high clinical suspicion of malignancy in all presentations of nipple disease.

A MODIFIED THORACO-ABDOMINAL FLAP FOR CHEST WALL DEFECTS

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Aims: To provide a reliable, easy-to-raise flap for coverage of chest wall defects that minimises potential patient morbidity.
Method: Patients undergoing a modified thoraco-abdominal flap for chest wall coverage were studied. There were 20 patients in the study and all chest wall defects were from advanced breast cancer. The thoraco-abdominal flap was designed:
- Based principally on the peri-umbilical blood supply of the abdominal wall
- Extending as far laterally as the posterior axillary line
- Extending as far inferiorly as the inguinal crease.

Results:
- All chest wall defects were successfully covered.
- 2 patients had minor distal flap necrosis which healed without surgery.
- Surgical time for flap cover was an average of 55 minutes. This is significantly quicker than many other options for chest wall cover.

Conclusions:
The modification of the thoraco-abdominal flap offers:
- Reliable chest wall coverage
- A flap that is relatively easy and quick to raise, and easy to teach
- A flap that preserves other reconstructive options, e.g. latissimus dorsi
- An improved aesthetic outcome for patients.

ONCOPLASTIC SURGERY FOR EARLY BREAST CANCER AT THE DOCTOR GEORGE MUKHARI HOSPITAL

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Oncoplastic surgery is an emerging approach which combines breast conservative surgery and plastic surgical techniques, allowing a wider resection together with a better cosmetic outcome.
Aim: To offer oncoplastic surgery for early breast cancer at the Dr George Mukhari Hospital.
Methods: Eight patients between the ages of 28 years and 80 years were offered oncoplastic surgery in 2008 and 2009. The TNM classification was T1 N0 M0 to T2 N1 M0. Patients were investigated with FNA, mammography and bone scans. MRI was done, especially in younger patients where mammography showed poor definition of the lesion because of dense breast tissue. Patients were assessed pre-operatively and pre-operative drawings done. Sentinel node lymphoscintigraphy was performed, and the location of sentinel node identified with a gamma detecting probe and then excised. Axillary lymph node dissection was carried out if lymph nodes were palpable. Wide local excision with tumour margin of 2 cm or skin-sparing mastectomy was done followed by immediate reconstruction with either latissimus dorsi flap or a TRAM flap or bilateral mammoplasty if asymmetry was present. Adjuvant chemotherapy was given to patients who qualified for chemotherapy and those at high risk.
Results: All patients were females, black and between the ages of 28 years and 80 years. Four patients were T2 N1 M0, 3 patients T1 N0 MO and 1 patient T1 N1 M0 and RVD positive. Three patients had skin-sparing mastectomy and reconstructed with TRAM flap (2 patients) and latissimus dorsi flap (1 patient). The cosmetic outcome was satisfactory and so far no recurrence has been reported. Another 3 patients had wide local excision and reconstruction with a latissimus dorsi flap. One patient had flap retraction because of inadequate mobilisation of the latissimus dorsi flap. Two patients had wide local excision and bilateral mammoplasty, also with satisfactory cosmesis. Histological results of all the patients showed ductal carcinoma. Six of the patients had negative sentinel lymph nodes and 2 had positive sentinel lymph nodes. Two patients had positive resection margins. No local recurrence has been reported so far.
Conclusion: The results show that oncoplastic surgery improves cosmesis and is oncologically safe. It is recommended for early breast cancer.

OPEN LYMPH NODE BIOPSY: A 12-YEAR EXPERIENCE

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Introduction: The HIV epidemic has brought with it a rising number of patients with generalised lymphadenopathy. Some investigators have reported the accuracy of FNA in this setting and have reserved open biopsy for a few cases where the diagnosis is in doubt. We have not had a similar experience.
Aim: We document our experience with open lymph node biopsy, the histological pattern of disease in this cohort of patients and reliability in making a diagnosis.
Patients and methods: Records of patients who underwent lymph node

biopsy between January 1997 and April 2009 were investigated. We looked at the histology and the site of the lymph node biopsy, and HIV status of these patients.
Results: Over this 12-year period 108 patients were subjected to lymph node biopsy; 48 were males and 60 females, with an average age of 40 (3 - 61).
Site of lymph node: 92 in the neck and 12 in the axilla, with 4 unspecified sites.

Histological pattern		Complication	
TB	**45**	**Seroma**	**6**
Lymphoma	**15**	**Wound sepsis**	**3**
Sarcoidosis	**3**	**Mortality**	**1**
Abscess origin	**1**		
Chronic lymphocytic leukaemia	**1**		
Lympho-epithelial cyst	**1**		
Reactive changes	**41**		

Conclusion:
• Open lymph node biopsy is safe.
• Despite concerns, surgical site infection is not a major problem.
• Diagnosis is accurate.

THE VIABILITY OF A BREAST EVALUATION CLINIC IN A NON-TERTIARY ENVIRONMENT

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Introduction: The role of a breast clinic in the management of patients with breast pathology is well established in a tertiary centre. However, its role in a non-tertiary environment is not well established.
Aim: The aim of this presentation is to look at the role that a breast evaluation clinic plays in a non-tertiary setting.
Patients and methods:
• A breast clinic at Sebokeng Hospital was started in May 2008.
• We looked at both records and the attendance register of our breast evaluation clinic at Sebokeng Hospital.
• We looked mainly at the pattern of presenting symptoms at the breast clinic.
Results: From May 2008 to April 2009 we saw 557 patients. All were female. Ages ranged from 14 to 80 years.
Presenting symptoms:
Mass – 42.9%, pain – 17.5%, fibro-adenoma – 14.7%, cancer – 8.9%, abscess – 5.20%, nipple discharge – 4.4%, TB – 0.8%, normal patients – 29.
Conclusions:
• A breast evaluation clinic is a viable venture in a non-tertiary setting.
• The commonest presenting symptom is a breast lump.

PRE-OPERATIVE DIAGNOSIS OF THYROID CARCINOMA

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Aim: To evaluate the preoperative diagnostic accuracy in patients with thyroid carcinoma and its impact on subsequent surgical intervention.
Method: We conducted a retrospective review of 74 patients with proven thyroid carcinoma managed by a single unit at Groote Schuur Hospital between 2004 and 2009. The pre-operative clinical, ultrasound and cytology findings were evaluated and the patients were divided into three groups: group A – thyroid carcinoma not suspected; group B – thyroid carcinoma suspected; group C – carcinoma proven.
Results: Eight patients (10%) had an unsuspected thyroid carcinoma while undergoing surgery for multinodular goitre (group A), 38 patients (51%) underwent surgery for a pre-operative suspicion of thyroid carcinoma (group B), and 28 (39%) were operated on with a definite pre-operative diagnosis of thyroid cancer (group C). Sixty-five patients (87%) had well-differentiated thyroid cancers, 5 medullary (7%) and 4 anaplastic cancer (6%). Of the patients with well-differentiated cancer 19 (29%) had a definitive pre-operative diagnosis; the rest, 46 (71%), required a diagnostic lobectomy. In contrast, all 8 patients with medullary and anaplastic carcinomas were diagnosed pre-operatively. All patients underwent pre-operative ultrasound: this reported 16 multinodular goitres (MNG), 14 dominant nodules in MNG and 44 solitary nodules. Only 22 patients had ultrasound reports which specifically mentioned findings suggestive of malignancy. Cytology reported 11 inadequate biopsies, 26 consistent with a benign nodule and 9 with atypical cells. Of the 19 well-differentiated cancers diagnosed pre-operatively (group C), the majority (11) were diagnosed on biopsy of lymph nodes or metastases and not thyroid tissue. Twenty-seven of the 28 patients in group C underwent a total thyroidectomy *ab initio*, whereas 35 patients in groups A and B underwent a diagnostic lobectomy, and subsequent completion thyroidectomy. Eleven patients required lobectomy only.
Conclusion: Establishing a confident pre-operative diagnosis in well-differentiated thyroid cancer is difficult but worth while, as it enables definite surgical intervention. Anaplastic and medullary cancers are diagnosed with a greater degree of confidence.

OUTCOME OF EMERGENCY LAPAROTOMY FOR ABDOMINAL TB

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Introduction: The rising incidence of HIV/ AIDS has resulted in a resurgence of abdominal TB in South Africa. These often debilitated patients not infrequently present with acute complications requiring surgery. We present our experience with this group of patients.
Methods and patients: A prospective descriptive audit of all patients with abdominal TB undergoing surgical treatment was conducted. From January 2008 to April 2009, 25 patients with positive histology for TB went for laparotomy. Fifteen were male and the mean age was 34 years. Seventeen were HIV positive and HIV status of the others was unknown.
Results: All had emergency laparotomy. Three patients had a prior CT abdomen. Nine patients presented with obstruction, 4 with perforation and the rest with peritonitis. Intra-operative findings were: frozen abdomen in 6 patients, small-bowel perforation in 7, enlarged lymph nodes and ileo-caecal mass in 13 and obstructed small bowel in 5. Ten patients (40%) had small-bowel resection, including 4 (16%) who had right hemicolectomies. Nine patients (36%) ended up with stomas (8 ileostomies and 1 colostomy). Two had primary anastomoses. Six patients (24%) had relaparotomies and 9 patients (36%) were admitted to ICU. Three patients developed enterocutaneous fistula and 4 patients were discharged with ventral hernia. Seven patients died (28%), of whom 6 had bowel resection, and 5 of them were admitted to ICU. Mean duration of hospital stay was 18 (5 - 69) days.
Conclusion: Emergency surgery for TB abdomen is associated with high mortality and morbidity with high ICU admission and prolonged hospital stay.

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. This prospective study looks at the role of laparoscopy in establishing the diagnosis of abdominal tuberculosis (TB).
Method: All patients with clinically suspected but histologically or microbiologically unconfirmed abdominal TB are referred for diagnostic laparoscopy. All grossly pathological tissues are biopsied and free fluid is aspirated for histological and microbiological assessment.
Results: From January 2008 to March 2009, 104 patients were referred to us. Forty-five patients underwent diagnostic laparoscopy and 35 of them were HIV positive. Laparoscopic findings included intra-abdominal lymphadenopathy in 31 patients, ascitic fluid in 30, intra-abdominal mass in 11, and deposits on bowel wall, peritoneum or omentum in 11. Thirty-one patients (68.8%) had positive histology for TB. An alternative diagnosis was established in 8 patients (17.7%). Of these 8 patients 3 had appendicitis, 1 metastatic adenocarcinoma, 1 cholestatic liver disease and 3 sinus histiocytosis. In 6 patients (13.3%) histology revealed either normal or nonspecific inflammation. One of these 6 patients had positive TB culture from a urine specimen.
Conclusion: Our preliminary results suggest that diagnostic laparoscopy can be very useful in the assessment of suspected abdominal tuberculosis and help diagnose alternative surgical pathology.

ERCP IN HIV-POSITIVE PATIENTS AT CHRIS HANI BARAGWANATH HOSPITAL: THE SPECTRUM OF DISEASE

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Aim: To describe the spectrum of disease in HIV-positive patients in whom an ERCP was performed.
Methods: Retrospective study of prospectively collected data and review of ERCP radiological films. All patients with diagnosed HIV who had an ERCP from December 2007 to March 2009 were included. The radiological films were then shown to a panel of experienced physicians; two surgeons, one gastro-enterologist and one radiologist, and a consensus diagnosis was reached for each patient.
Results: Twenty-seven patients were identified, 16 female and 11 male. Ages were from 23 to 54 years, average 36 years. The cholangiographic diagnoses were as follows:

Diagnosis	No.
Extrinsic hilar compression	**1**
Distal bile duct stricture	**5**
Bile duct stones	**4**
Normal	**4**
Retroviral-associated cholangiopathy	**10**
Common hepatic stricture	**1**
Unkown	**2**
Total	**27**

The spectrum of disease is a combination of the well-described diseases in which an ERCP may be indicated and retroviral-specific disease.
Conclusion: HIV-positive patients undergoing ERCP at Chris Hani Baragwanath Hospital have the usual spectrum of stone and malignant disease as well as retroviral-associated cholangiopathy.

ILIOPSOAS ABSCESS IN SOUTH AFRICA IN 2009

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Background: Although iliopsoas abscess (IPA) is common in South Africa, there are currently few clinical data available on this condition in our environment.
Methods: Basic clinical and epidemiological data were prospectively gathered on patients undergoing surgical exploration for a clinical/radiological diagnosis of IPA at a single hospital in the Boland over a 22-month period.
Results: During this period 14 patients were explored for IPA. All had clinical signs of IPA and all underwent an ultrasound examination which confirmed the clinical diagnosis. An additional patient with a radiological diagnosis of IPA, and known with TB abdomen, retroviral disease and no clinical signs of IPA, was not explored and was excluded from the study.

The study group comprised 11 males and 3 females. Median age was 31 (range 11 - 46). The abscess was right-sided in 8 patients, left-sided in 4 and bilateral in 1. Median temperature was 37.6 (range 36.6 - 39), median white cell count was 10.6 (range 6.6 - 29.6); only 4 patients had a white cell count in excess of the normal range. Culture of the abscess showed TB (5 cases), *Staphylococcus aureus* (3 cases), no growth (3 cases), *S. epidermidi*s (1 case) and mixed growth, bowel organisms (1 case). In 1 patient, the radiological diagnosis of IPA was not confirmed at exploration. All 3 of the 'no growth' cases were known to have tuberculosis at other sites and were all known to be HIV positive.
Conclusions: In the South African context, iliopsoas abscess is a disease of young adults and is frequently associated with tuberculosis and HIV/AIDS. Temperature and white cell count are often normal.

SURGICAL MANAGEMENT OF NECROTISING ENTEROCOLITIS (NEC): OUTCOME OF PERITONEAL DRAINAGE IN BLOEMFONTEIN ACADEMIC HOSPITALS

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Purpose: Peritoneal drainage for NEC has been used since 1975. It was initially described as a temporary procedure, but is increasingly used as the sole surgical intervention. These patients are very fragile, and the insult of drainage is much smaller than a laparotomy. Management of NEC with drains alone versus drains followed by surgery once the patient is stable, is controversial. We assessed patients treated with drains to determine the outcome and to see how many needed definitive surgery afterwards.
Methods: Case records of 29 patients in need of surgical treatment over the past five years were retrospectively reviewed.
Results: Three were taken to theatre directly. In 26, a 6 mm pencil drain was placed in each lower quadrant. Four patients died – 2 before any further intervention and 2 after laparotomy. Of the remaining 22, 11 needed no further surgery. In the remaining 11 the indication for surgery was as follows: worsening of general condition: 9; resection of stenotic areas established on contrast enemas before discharge: 1; persistent entero-cutaneous fistula: 1.
Conclusion: 50% of our NEC patients requiring surgical intervention and treated with peritoneal drainage did not need any further surgery. This is in keeping with other authors (27 - 46%). In 9% an emergency was turned into an elective operation on a healthy baby. Although big randomised, controlled studies are still pending, the outcome of this retrospective review emphasises the value of using peritoneal drainage in the surgical management of NEC.

INTRA-OPERATIVE CHOLANGIOGRAPHY USING THE KUMAR CHOLANGIOGRAPHY CLAMP DURING LAPAROSCOPIC CHOLECYSTECTOMY AT DR GEORGE MUKHARI HOSPITAL

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Aim: Intra-operative cholangiography is an important tool in evaluating patients with suspected choledocolithiasis and delineating biliary tree anatomy during laparoscopic cholecystectomy. This study investigates the use of the Kumar Preview cholangiography clamp as a means to the performance of efficient and adequate intra-operative cholangiography.
Methods: The Kumar Preview cholangiography clamp is designed to allow performance of an intra-operative cholangiogram using a custom-made needle catheter. The cholangiogram is taken *prior* to division of the cystic duct. Six patients in whom laparoscopic cholecystectomy was indicated for symptomatic cholelithiasis or cholecystitis were selected to undergo cholangiography during the procedure. A cholangiogram was taken using a standard X-ray plate and a portable machine after injection of 20 ml of dilute Urografin via the catheter. Cholangiography was performed after complete anatomic dissection of Calot's triangle and after the cystic artery had been divided.
Results: The six patients selected were all female. One patient had presented with acute acalculous cholecystitis and 1 had previously been admitted with an episode of biliary pancreatitis. The other 4 patients had presented with attacks of acute cholecystitis. The mean age was 37 (range 24 - 66). Cholangiography was performed after dissection of Calot's triangle and identification of the cystic duct and artery. In 4 of the 6 cholangiograms flow of contrast to the duodenum was visualised. In 2 of the 6, the common bile duct and intrahepatic ducts were visualised adequately. The volume of contrast injected as well as the taking of a single cholangiography film may have affected the efficacy of the technique.
Conclusion: The Kumar cholangiography clamp has the potential to allow safe and efficient intra-operative cholangiography. Refinements in technique and the use of intra-operative X-ray screening may significantly improve efficacy.

SELECTIVE NON-OPERATIVE MANAGEMENT OF KIDNEY GUNSHOT INJURIES: A PROSPECTIVE STUDY

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Background: Non-operative management (NOM) of kidney gunshot injuries as an alternative to surgical exploration is rarely reported. The aim of this study was to assess the feasibility and safety of selective NOM of kidney gunshot injuries.
Patients and methods: A prospective study including all kidney gunshot injuries admitted to a level I trauma centre over a 4-year period (April 2004 - March 2008) was conducted. Patients with abdominal gunshot wounds with haematuria without an indication for immediate laparotomy (peritonitis, haemodynamic instability, head or spinal cord injury) had an intravenous contrast abdominal CT scan done. Patients with confirmed kidney injuries were observed with serial clinical examinations. Outcome parameters included need for delayed laparotomy, complications, length of hospital stay and survival.
Results: During the study period, 33 patients with kidney gunshot injuries were selected for NOM without laparotomy. The mean injury severity score was 10.5 (range 4 - 25). Simple kidney injuries (grades I, II) occurred in 15 (45.5%) patients and complex kidney injuries (grades III, IV) in 18 (54.5%). Associated injuries included 14 (42.4%) liver, 4 (12.1%) spleen and 6 (18.2%) diaphragm, lung contusion, and haemothorax, each. Three patients required delayed laparotomy, 2 for non-renal indications, and one patient had a delayed nephrectomy for a grade IV injury. The overall successful NOM rate was 90.9%. The mean hospital stay was 5.9 (range 2 - 23) days. There were no kidney-related complications and no mortality.
Conclusion: Selective NOM of patients with kidney gunshot injuries is a feasible, safe and an effective alternative to routine exploration.

SELECTIVE NON-OPERATIVE MANAGEMENT OF PELVIC GUNSHOT WOUNDS: A PROSPECTIVE STUDY

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Background: The non-operative management (NOM) of abdominal gunshot injuries is slowly gaining acceptance. Patients with pelvic gunshot injuries constitute a subgroup of patients at high risk of visceral injury. The aim of this study was to assess the feasibility and safety of the selective NOM of transpelvic gunshot injuries.
Material and methods: This prospective ethics-approved study period was from 1 April 2004 to 30 Nov 2008. The anterior anatomical definition of the pelvis was from the anterior superior iliac spine (ASIS) to the pubis and inguinal ligaments, and posteriorly from the ASIS to the lower buttock crease. Patients with radio-opaque missiles within these boundaries were included in the study regardless of the site of the entrance wound. Laparotomy was performed for diffuse peritonitis, haemodynamic instability and CT-confirmed urological injuries. Stable patients with no tenderness or tenderness confined to the wound or wound tract underwent serial abdominal examination. Patients with non-acute diffuse abdominal findings with haematuria underwent routine CT with IV contrast and CT cystography. CT scanning to delineate bullet trajectory was left to the discretion of the attending surgeon.
Results: During the 54-month study period, 239 patients with pelvic gunshot injuries were treated. One hundred and seventy-six (73.6%) patients underwent immediate laparotomy, while 63 (26.4%) were selected for NOM. The non-therapeutic laparotomy rate was 4.5% in the former group, and no patient required delayed laparotomy in the latter group (i.e. 100% successful NOM). In addition, 3 patients with extraperitoneal bladder injuries were successfully managed non-operatively. Associated injuries included mostly fractures to the pelvis: iliac blade (19), pubic ramii (3) and acetabulum (3). The mean hospital stay was 2.5 (range 1 - 4) days.
Conclusions: Selective NOM of pelvic gunshot injuries is a safe and feasible option.

THE UNNECESSARY LAPAROTOMY AND MORTALITY RATES IN PATIENTS WITH ABDOMINAL GUNSHOT WOUNDS (AGSW) PRESENTING TO AN URBAN TRAUMA CENTRE: A PROSPECTIVE STUDY

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Background: Urban trauma centres in South Africa treat many patients with abdominal gunshot wounds. The aim of this prospective, ethics-approved study was to determine the unnecessary laparotomy and mortality rates in these patients.
Patients and methods: The study period was from 1 April 2004 to 31 December 2008. Laparotomy was performed for diffuse peritonitis and haemodynamic instability, and those failing abdominal observation. Stable patients with no tenderness or tenderness confined to the wound or wound tract underwent serial abdominal examination. Patients with non-acute abdominal findings with haematuria underwent CT scanning. Patients with a suspected right upper quadrant bullet trajectory and/or localised right upper quadrant tenderness suggestive of an isolated liver injury also had a CT scan. An unnecessary laparotomy was defined as negative where no intra-abdominal injuries were found, and non-therapeutic was defined as one where an injury was found but did not require any intervention.
Results: During the study period 1 030 patients with AGSW were seen. Of these, 30 (2.9%) died in the emergency room before reaching the OR; 737 (71.6%) had immediate indication for laparotomy and of these, there were 65 (8.8%) deaths. The unnecessary laparotomy rate among patients undergoing immediate laparotomy was 19 (2.5%). Two hundred and sixty-three (26.3%) patients were selected for non-operative management (NOM), of which there were 14 (5.3%) who failed NOM. There was 1 mortality in the NOM group – this was unrelated to AGSW with postmortem findings confirming a massive pulmonary embolus.
Conclusion: AGSW managed in our centre has a low mortality and low unnecessary laparotomy rates. Selective NOM of AGSW is safe.

CAN S100B ASSIST IN ELIMINATING PATIENTS WITH TRAUMATIC BRAIN INJURY THAT REQUIRE NO FURTHER INVESTIGATION WITH CT SCAN?: PILOT STUDY

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Introduction: S100B protein is most abundant in brain tissue. It is released during trauma and remains elevated in serum for up to 12 hours post injury. Literature suggests correlation of S100B protein with the severity and outcomes in TBI. CTB scans are not available in all hospitals managing acute head injuries.
Hypothesis: We hypothesise that S100B protein can select out for patients with minor head injuries, who will require no further CTB investigations and can therefore be managed conservatively.
Method: Prospective observational study over 6-month period. Patients with TBI were entered into the study. All patients had a CT of the brain. Data analysed include demographics, GCS, clinical findings, CTB findings, S100B protein levels.
Results: Of the 49 patients recruited for the study, 47 were male. Thirty-two (32) patients had GCS of 13 - 15, 4 had 9 - 12 and the remaining 13 had 3 - 8. Skin/soft-tissue trauma was the most common associated injury. Concussion was diagnosed in 29 patients, whereas TBI with bleeds was noted in 21 patients (median S100B protein was 1.25 µg/l and 1.86 µg/l respectively: *p*-value 0.375). Seven patients had raised ICP on CTB. Three patients had non-traumatic brain lesions (S100B 2.52 µg/l).

Median level (study)	**0.7 µg/l**
Range (study)	**0.07 - 11.230 µg/l**
Normal (reference)	**<0.105 µg/l (97%)**
Moderate elevation (ref)	**<0.2 µg/l**
Significant elevation (ref)	**>0.2 µg/l**

CTB findings	No.	Percentile	Summary	
Normal (1)	**25**	**51.0%**	**Concussion**	**25**
TSAH (2)	**3**	**6.1%**	**Bleeds/fracture**	**21**
SDH (4)	**3**	**6.1%**	**Non-trauma**	**3**
ICH (6)	**2**	**4.1%**		
Raised ICP (7)	**6**	**12.2%**		
Skull fracture (9)	**7**	**14.4%**		
Non-trauma (10)	**3**	**6.1%**		

Conclusion: There was no correlation between the level of S100B protein and the severity of head injury on CTB. S100B protein did not select out minor head injuries that can be safely managed without a CT scan or need to refer to neurosurgical team.

AN AUDIT OF FAILED SELECTIVE CONSERVATISM

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Selective non-operative management based on clinical assessment has been shown to be a generally safe approach in the management of penetrating stab wounds of the torso. However, there will be a subset of patients who fail selective conservative management. This audit focuses on the patients who fail selective conservatism.
Methods: The metropolitan surgical service in Pietermaritzburg covers three hospitals. At the weekly metropolitan morbidity and mortality meeting all trauma patients are reviewed. All cases of failed selective non-operative management of penetrating abdominal stab wounds are discussed. Failed non-operative management is defined as the failure to predict the need for operative exploration within 24 hours of admission. If repeated clinical examination accurately predicts the need for exploration within this time period this is not classified as failed non-operative management.
Results: A total of 340 patients with a penetrating anterior abdominal stab wound were managed over the 2-year period under review. A total of 182 (51%) of these patients were subjected to mandatory laparotomy. Of these mandatory laparotomies, 98% were positive. The remaining 148 (44%) patients were observed. Of the 148 observed patients a total of 30 (20%) subsequently underwent surgery. A total of 13 patients were only taken to surgery after 24 hours of observation. In this group of 13 patients the average delay between admission and recognition of injury was 40 hours. There were 6 gastric injuries, 1 pyloric and pancreatic injury, 2 gallbladder injuries, 1 liver, 1 colon and 2 small-bowel injuries. There were no deaths. Nine patients recovered with no additional morbidity. In the remainder, morbidity included relaparotomy (1), open abdomen (1), renal failure (1) and prolonged stay in ICU (3).
Conclusion: Clinical assessment accurately predicts the need for urgent laparotomy following a stab wound to the torso. In patients who do not meet the indications for urgent laparotomy and who are subjected to conservative management, 20% will come to surgery. However a significant number will only come to surgery after more than 24 hours of observation. There appear to be particular anatomical sites and structures that are prone to error.

A RETROSPECTIVE STUDY OF PANCREATIC TRAUMA AT THE CHARLOTTE MAXEKE JOHANNESBURG ACADEMIC HOSPITAL TRAUMA UNIT

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Introduction: Pancreatic injuries are uncommon but remain a diagnostic and therapeutic challenge with high morbidity and mortality.
Aim: To re-evaluate factors influencing outcomes of pancreatic injury at an urban trauma unit.
Methods: Retrospective review of prospectively collected data for pancreatic injury from June 2005 to April 2009. Data included age, gender, mechanism of injury, Injury Severity Score (ISS) and NISS, systolic BP on admission, presence of concomitant injured organs, AAST grade of pancreatic injury, management, complications and mortality.
Results: Ninety-four (94) patients with mean age 30 years were evaluated. GSW were 35 (38%), stab 31 (33%), and blunt 28 (29%). Minor pancreatic trauma (grade I-II) and major (G III-V) were 37% and 57% respectively. ISS ranged from 4 to 75 (mean 24). Intra-abdominal associated injuries were 73 solid organ injury, 67 hollow viscus injuries, and 30 vascular injuries. Surgical procedures included drainage 43 patients (45.7%), repair and drainage 21 (22.3%), distal pancreatectomy 14 (14.9%), Whipple procedure 1 (1.1%). The complication rate in survivors was 20% and included pancreatic leak, acute renal failure, ARDS, MOF, wound sepsis and ileus.

Overall mortality was 50%. Twenty-one (22.3%) patients presented *in extremis* and died in the ED or in theatre. Most deaths were due to associated intra-abdominal injuries. The survivor group had a lower incidence of high-grade pancreatic injuries.
Conclusions: The majority of injuries were due to penetrating trauma. A significant number of patients had concomitant intra-abdominal injuries. Mortality correlated with haemodynamic instability, grade of pancreatic injury and presence of a concomitant intra-abdominal injury.

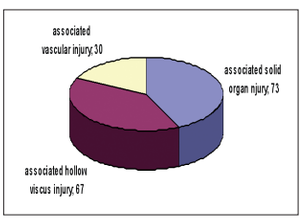

Fig. 1. Associated injury.

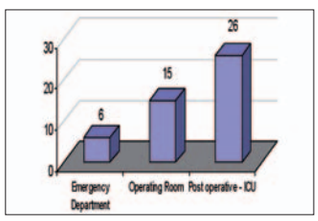

Fig. 2. Site of death.

PENETRATING CARDIAC INJURY OUTCOMES IN JOHANNESBURG TRAUMA UNIT

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Introduction: Cardiac trauma is still associated with significant mortality. Penetrating trauma remains the common mechanism, with poorer outcomes in GSW injuries, and/or patients presenting *in extremis*.
Aim: Audit the outcomes of penetrating cardiac trauma in patients presenting at the Charlotte Maxeke Johannesburg Academic Hospital Trauma Unit.
Method: Retrospective analysis of electronic trauma data and clinical notes over a 3-year period. Data included demographics, injury patterns, haemodynamic status on arrival, ISS, NISS, ISS PS (percentage survival), NISS PS, in-hospital morbidity and mortality outcomes. Survivors' physiological scores were compared with non-survivors'.
Results: Forty-five (45) patients presented to our unit, 3 of whom were female. Median age was 28 years. There were 41 stabs and 4 GSW. Median RTS of 5.6, ISS 25, NISS 34.5 with calculated survival of 92% and 44% by ISS and NISS respectively. Only 15 patients were stable on arrival. The right ventricle was the commonly injured chamber (21/45), followed by the left ventricle (15/45). Thoracotomy was performed in 24 patients and sternotomy in 19. Survival was 30/45 (66%) overall, 29/41 (77%) in stabs, and only 1/4 (25%) in GSW. Survivors versus non-survivors had ISS PS of 96 v. 22.5%, and NISS PS of 92.5 v. 4%. Complications included wound sepsis in 6 patients and pneumonia in 1.

Description	Overall	Survivors	Non-survivors
Outcome	**45**	**30**	**15**
RTS	**5.6**	**7.1**	**3.55**
Stable	**15**	**14**	**1**
Unstable	**30**	**16**	**14**
ISS (median)	**25**	**25**	**26**
ISS PS (expected survival)	**92.5%**	**96%**	**22.5%**
NISS (median)	**34.5**	**34**	**42**
NISS PS (expected survival)	**44%**	**92.5%**	**4%**
Stab	**41**	**29**	**12**
GSW	**4**	**1**	**3**

Conclusion: Mortality remains high in penetrating trauma. Haemodynamic instability and GSW were associated with poorer outcomes.

ELUCIDATION OF ARGININE UPTAKE BY ENDOTHELIAL CELLS

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Arginine is a constituent of proteins as well as the precursor of nitric oxide (NO), creatine and creatinine, and with glutamine regulates the availability and excretion of nitrogen in the body. Uptake of arginine into endothelial cells regulates NO production and is reported to be mediated by at least 2 transporters, one of low capacity/high affinity and the other of high capacity/low affinity.

Simultaneous uptake of molecules follows Michaelis-Menten kinetics:

$$v = \frac{V_{ma}.[S]}{K_{ma}^{+}[S]} + \frac{V_{mb}.[S]}{K_{mb}^{+}[S]}$$

where v = uptake velocity; S = substrate concentration [ ]

V_m = maximum velocity of uptake and

K_m = [S] at $V_m/2$ of the transporters a and b.

In the presence of inhibitors (I) the K_m term includes an inhibition constant (K_i) which then becomes ($K_m(1 + [I]/K_i)$ if the inhibitor competitively inhibits uptake. The above equation then has 6 unknowns and reported methods to determine the kinetics of uptake are not clear. Some studies subtracted the linear uptake (transport by diffusion) noted at supra-physiological concentrations (>1 500 µmol/l), assuming that this occurs at all substrate concentrations. The frequently used method of Deves *et al.* (1992) assumes that the type of inhibition of both transporters is identical at all substrate and inhibitor concentrations.

We determined uptake of ^{14}C-labelled arginine by endothelial cells in the presence of unlabelled arginine (Nel *et al.*, 2008) and/or an inhibitor, leucine. After correcting for isotope dilution (assuming that labelled and unlabelled arginine were taken up identically), the type of inhibition at the various concentrations of I and S, were determined using the reciprocal Lineweaver-Burke plot (1/v v. 1/[S]) or by plotting 1/v v. [I]. In addition the 6 kinetic constants were simultaneously determined by minimising differences between experimental data points and the theoretical curves (competitive/non-competitive inhibition) using EXCEL Solver™ (Microsoft Corp; least-squares method).

The Lineweaver-Burke plot revealed that arginine uptake was clearly biphasic above and below 100 µmol arginine/l (approximately physiological concentrations). At physiological concentrations there was no evidence of linear uptake by diffusion, which would be suggested by curvature of the reciprocal plot. However, when the calculated kinetic constants were substituted into the equation (above), the calculated velocity was much greater than that experimentally determined. Leucine competitively inhibited arginine uptake by endothelial cells only when [arginine] ≤100 µmol/l and [leucine] <100 µmol/l.

There appears to be interaction between the transporters, or they operate independently of each other. The assumptions reported in the literature that a) uptake of arginine by diffusion occurs at physiological concentrations and b) the inhibition of arginine uptake by endothelial cells is identical at all concentrations of arginine substrate and/or leucine inhibitor concentrations, are not correct.

Deves *et al. J Physiol* 1992; 454: 491-501.
Nel M *et al.* Proceedings of the SRS. University of Cape Town 2008.

FASTING PLASMA ARGININE CONCENTRATIONS AND AMBULATORY BLOOD PRESSURES

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Stroke, end-stage renal failure and heart failure are the consequences of elevated blood pressures which afflict the African community far more than other racial groups. Arginine is the precursor to the arterial vasodilator nitric oxide (NO), a key cellular messenger and mediator of a host of physiological functions. Although supplementation with arginine is known to reduce blood pressure, there have been several reports, including our own study, demonstrating *elevated* fasting plasma arginine concentrations in patients of African ancestry with hypertension. This suggests that arginine is available but is either not available for NO formation or the NO formed is degraded or cannot mediate vasodilation. There are few baseline data, both locally and internationally, on fasting plasma arginine concentrations and whether these affect ambulatory blood pressure profiles.
Methods: 24-hour ambulatory blood pressures (ABPM) were measured in consenting participants recruited from clinics in the Johannesburg area. Fasting blood samples were obtained and frozen until analysed by HPLC/mass-spectrometry.
Results: Arginine concentrations were elevated in subjects with hypertension and correlated with average diastolic pressures, particularly night-time DBP (r=0.280; p<0.05). In males of BMI <30 kg/m^2, arginine correlated with both night-time diastolic (r=0.461; p<0.005) and systolic pressures (r=0.420; p<0.005). These data are similar to data reported in the literature. Re-analysis of the data, dichotomising by the median arginine concentration (56 µmol/l), showed differences in the ABPM profile pattern between the arginine groups.
Conclusion: Plasma concentrations of the NO precursor arginine are elevated in black South Africans with hypertension and correlated with average night-time blood pressure, particularly in men of lower BMI. As fasting arginine concentrations were elevated in black South African subjects with hypertension, further studies are needed to determine whether decreased arginine uptake into endothelial cells or NO production/availability contributes toward the increased blood pressure in this high-risk population. ABPM profile patterns differed between study participants with higher and lower arginine concentrations.

THE EFFECTS OF ARGININE AND HOMOCYST(E)INE ON NITRIC OXIDE PRODUCTION IN ECV_{304} and HUVEC VASCULAR ENDOTHELIAL CELLS

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Introduction: Nitric oxide (NO) is known to play a crucial role in arterial vasodilation. Reductions in vasodilation can arise from a deficiency of arginine (arg), the precursor of NO, and/or an excess of Hcy which inactivates NO. As arg and Hcy share the same membrane transporter (y+ cationic amino acid transporter, Foreman *et al.* 1980 and 1982), the degree to which they impact upon each other and hence influence the NO available for vasodilation needs to be explored. To address this issue we have previously performed studies in a transformed human umbilical vein endothelial cell line, ECV_{304} (ECVs), as these cells are immortal. However, whether these transformed cells (ECVs) are appropriate to use as a model of endothelial cells remains to be determined. Hence we need to investigate and compare the impacts of arg and Hcy on NO production in ECVs and non-transformed primary endothelial cells (human umbilical vein endothelial cells, HUVECs).
Aim: The aim of this study was therefore to compare the effects of arg and Hcy on NO production in the transformed ECV_{304} cell line versus in the primary HUVEC cells.
Materials and methods: Cells were plated out in six well cell culture plates. The cells were incubated at 37 degrees centigrade at 5% CO_2 for 24 hours in culture media. Culture media were replaced with test media for 24 hours. Test media were replaced with phosphate buffered saline containing various concentrations of either arg or Hcy. Production of NO was measured using a fluorescent probe and a fluorometer.
Results: In both ECVs and HUVECs, increased arg concentrations resulted in an increase in NO production rapidly over time. Greater concentrations of

NO were produced by HUVECs compared with ECVs. In both types of ECs, NO production was found to be optimal at 100 μM arg, which is in keeping with the normal serum concentration of arg. Moreover, Hcy rapidly inhibited the production of NO in both EC types, even at low Hcy concentrations.
Conclusions: These findings indicate that although the ECVs are a transformed cell line, they are a good model for investigating the effects of arg and Hcy on NO production in endothelial cells.

ENDOSCOPIC RETROGRADE CHOLANGIO-PANCREATOGRAPHY (ERCP): A COMPARISON OF TWO PROSPECTIVE AUDITS

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Objective: An audit was established in December 1995 by the author to determine the pathology found at ERCP and the success and complications of ERCP and endoscopic sphincterotomy. In November 2001 results of the audit were reviewed and published, and the conclusion reached was that ERCP should be used for therapeutic purposes only and less invasive modalities (viz. magnetic resonance cholangiography) for diagnosis. We did a follow-up audit from January 2002 to December 2008 to compare the pathology, success and complications of ERCP and therapeutic interventions (sphincterotomy, stone extraction, stent placement).
Study design: The study is a prospective audit of data for ERCPs performed between 1 January 2002 and December 2008 and a comparison with the previous audit (December 1995 until November 2001).
Results (results of the previous audit in brackets): The author performed 1 224 (1 591) ERCPs on 1 085 (1 498) patients, an average of 15 (22) per month. The indication for the procedure was therapeutic (sphincterotomy, stone removal, or stent placement) in 86.5% (55%) and diagnostic in 13.5% (45%) of patients. Pathology found included gallstone disease 52% (39%), malignant disease 22.5% (19%), pancreatitis 3.8% (12%), bile duct injuries 6.5% (5%) and other diseases 8.2% (8%). The findings on ERCP were normal in 7% (17%) of patients. ERCP was successfully performed in 93% (86%) of patients, stone extraction was successful in 92% (81%) and stent placement was successful in 88% (59%). Complications occurred in 2.6% (2.8%) of procedures, and they were pancreatitis 0.9% (1.1%), bleeding 0.3% (0.9%), perforation 1.1% (0.7%), aspiration 0.16% (0). Two (3) patients died due to a complication (0.16% v. 0.19%).
Conclusion: Fewer ERCPs were performed compared with the previous audit, probably because most ERCPs were for therapeutic purposes and MRCP was used for diagnosis. The success rate went up with regard to stone extraction and stent placement. The complication rate remained the same. ERCP remains a risky procedure and should be reserved for therapeutic purposes.

ANTIBIOTIC PROPHYLAXIS FOR PATIENTS UNDERGOING ELECTIVE ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY: A META-ANALYSIS

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Background: The use of prophylactic antibiotics before endoscopic retrograde cholangiopancreatography (ERCP) is recommended by all major international gastro-enterological societies, especially in the presence of an obstructed biliary system. Their use is intended to decrease or eliminate the incidence of septic complications following the procedure, namely cholangitis, cholecystitis and septicaemia. Whether this is the case is debatable.
Objectives: To determine whether or not prophylactic antibiotics before ERCP decrease the incidence of cholangitis, septicaemia, and mortality *by way of a meta-analysis.*
Selection criteria and search strategy for studies: Only randomised clinical trials were included in the analysis, irrespective of blinding, language or publication status. Participants were patients who underwent elective ERCP and who were not on antibiotics, without evidence of acute or chronic cholecystitis, cholangitis, or severe acute pancreatitis before the procedure. We compared patients given prophylactic antibiotics before the procedure with patients given a placebo or no intervention before the procedure. Trials were included regardless of the type, dose, or route of administration of the antibiotic.

We searched the *Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL)* in *The Cochrane Library* (the latest issue), *MEDLINE* (1974 to present), *EMBASE* (1980 to present), *LILACS* (1982 to present), and *Science Citation Index Expanded* (1974 to present). Relevant medical and surgical international conference proceedings were also searched.
Main results: Nine randomised controlled trials (1 356 patients) were identified for inclusion into the analysis. When all patients were included the meta-analysis favoured the use of prophylactic antibiotics in preventing cholangitis (relative risk [RR] 0.54 CI 0.33 to 0.91) and septicaemia (RR 0.35 CI 0.11 to 1.11), but not overall mortality (RR 1.33 CI 0.32 to 5.44). If one selects patients in whom the ERCP resolves the biliary obstruction at the first procedure, there is no benefit in using prophylactic antibiotics to prevent cholangitis (RR 0.98 CI 0.35 to 2.69).
Conclusion: It appears that prophylactic antibiotics are not necessary if the first ERCP procedure is successful in resolving the biliary obstruction. However, if this is not the case antibiotics should be given. Further research is required to determine whether antibiotics can be given at the time of ERCP if it becomes apparent that the obstruction cannot be relieved during that procedure.

PREVALENCE OF *HELICOBACTER PYLORI* INFECTION IN PATIENTS WITH BENIGN PEPTIC ULCER DISEASE AT DR GEORGE MUKHARI HOSPITAL

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Aim: *Helicobacter pylori* infection is recognised as a significant aetiological factor in the pathogenesis of peptic ulcer disease. This study investigates the prevalence of infection in this patient group.
Methods: Patients with peptic ulcer disease diagnosed at endoscopy from the period July to October 2008 were screened for *H. pylori* using the CLO test method. All patients were treated with triple therapy consisting of amoxycillin (1 g PO 8-hourly), clarithromycin (500 mg PO 8-hourly) and omeprazole (20 mg PO daily). Patients with suitably completed endoscopy reports detailing the CLO test result as well as documentation of appropriate risk factors (smoking/NSAID use) were selected for analysis.
Results: Thirty-five patients (female/male ratio of 1:1.3) were studied. The mean age was 49 (range 19 - 88). Thirty-four of these patients were black. *H. pylori* was present in 7 out of 14 patients with duodenal ulcers versus 7 out of 19 patients with gastric ulcers. Twenty-one patients had a history of NSAID use; 10 of these patients were *H. pylori* positive. Fifteen patients gave a history of smoking. Five of these patients were *H. pylori* positive. In total 15 of the 35 patients tested *H. pylori* positive.
Conclusion:
1) These preliminary data suggest that empiric treatment for *H. pylori* in patients with peptic ulcer disease at Dr George Mukhari Hospital is not justified.
2) Further studies are required to assess eradication of *H. pylori* and long-term recurrence.

SYMPTOMATIC DIVERTICULOSIS IN JOHANNESBURG

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Aim: To describe the pattern and frequency of symptomatic diverticulosis in an urban South African population.
Methods: A consecutive series from a single hospital in Johannesburg (1994 to 2009), diagnosed endoscopically or radiologically.
Results: *Ethnicity*: The sample comprised 909 patients (22.5% black [B]; 47.4% white [W]; 20.8% Coloured [C]; 9.3% Indian [I]). The community the hospital serves comprises approximately 40% B, 30% W, 20% C and 10% I, which is different from national demographics.
Gender: Overall, there was a slight male preponderance (♂:♀ 0.5:1).
Age: Mean age at presentation remained constant throughout the study period, and did not differ significantly between races (B 68.4 y; W 69.6 y; C 67.7 y; I 66.4 y); the range was from 34 y to 96 y.
Severity: Diverticulosis defined as 'severe' was present in 21% of patients; there were no ethnic differences. Of note, however, and parallel with the increase in numbers of women affected, there were marked differences in the presence of severe disease among blacks: 10% of men, and 31% of women.
Anatomical distribution: In keeping with its acquired nature, the disease was predominantly left sided (sigmoid + descending) in all groups (B 57.1%; W 79.4%; C 70.7%; I 67.9%). Slightly more black patients (30%) had pancolonic disease than others (NS), and very few had exclusively right-sided diverticula (B 9%; W 4%; C 9%; I 4%).
Presentation: The most common complication was bleeding (42%), which settled spontaneously in all but 6; these were treated by segmental colectomy according to the extent of involvement. Acute diverticulitis was an unusual presentation (74 patients, 8.1%), but a high proportion of these required surgery.
Surgery: Overall, only 42 patients (4.6%) required surgery: 6 for bleeding; 5 for internal or external fistulas; sigmoid colectomy in 9 for abscesses not resolving with percutaneous drainage; 4 for stricture; 15 for severe diverticulitis and non-resolving inflammatory mass (with 2 unsuspected cancers); and 3 laparotomies for free perforation.
Conclusion: Symptomatic diverticulosis is common among all races in urban South Africa, and has increased dramatically among blacks over the past 30 years. Ethnic differences in the clinical picture are small. Bleeding is the most common presentation among all groups; surgery is required in <5% of patients.

MANAGEMENT OF LEFT-SIDED COLONIC OBSTRUCTION: AN AUDIT OF A STENT-BASED PROTOCOL

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Introduction: Colonic obstruction is a potentially fatal condition with mortality rates for emergency surgery of 15 - 22%. Since 2006, we have treated left-sided obstructing colon cancers by endoscopic decompression using self-expanding metal stents. The purpose of the study is to determine the safety and efficacy of this management protocol.
Patients and methods: This is a retrospective audit of all patients who presented with left-sided colonic obstruction due to adenocarcinoma to the Colorectal Surgery Unit at Groote Schuur Hospital, Cape Town, between January 2006 and April 2009. Data were collected for level of obstruction, stent success/failure, indication for stent (palliative or bridge to surgery), length of hospital stay, complications, stoma rate and mortality.
Results: Fifty-eight patients presented to the unit during the study period.

Patient records could not be obtained for 1 patient and he was excluded from the study. The level of the obstructing lesion was: sigmoid 32, rectosigmoid 14, splenic flexure 5, descending colon 3, ileocolic anastomosis (recurrence) 2, rectal 1. Stents were successfully placed in 46 of the 57 patients (80.7%). Twenty-one stents were placed as a 'bridge to surgery'. In 25 patients, the stent served as their definitive palliative treatment. The median length of hospital stay after successful stent placement was 7 days (range 1 - 18). The median hospital stay after failed stenting was 16 days (range 6 - 30).

Of the 11 patients in whom stenting failed, emergency stoma creation was required in 8, 2 underwent emergency definitive surgery without diverting stomas while 1 patient was deemed unfit for further intervention.

Complications of stenting occurred in 6 patients, and 1 of these patients required a permanent colostomy.

Four patients (8.6%) died in hospital. No patient died from complications related to stenting.

Conclusion: In our unit, stent placement for malignant left-sided colonic obstruction could be performed safely, with a low mortality and complication rate, and allowed most patients to avoid colostomy.

RADIOGUIDED OCCULT LESION LOCALISATION FOR IMPALPABLE RADIOLOGICAL ABNORMALITIES OF THE BREAST: A PROSPECTIVE STUDY

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Background: Radioguided occult lesion localisation (ROLL) is a new technique for localising and excising clinically impalpable radiological abnormalities for histological assessment. The technique relies on intralesional injection of a radiolabelled Tc-99 colloid and intra-operative use of a hand-held gamma probe to guide the excision.

Aim: The aim of the study was to clinically validate the technique in the Breast Surgery Unit at Groote Schuur Hospital. The primary end-point of the study was the accuracy of this technique in removing the suspicious lesion.

Patients and methods: Data were collected prospectively on 71 patients from January 2003 to December 2007. In all patients the abnormality detected either on ultrasound or mammogram was injected with a radiolabelled colloid 1 - 26 hours pre-operatively (mean 18 hours) and removed with a hand-held gamma probe. All specimens were X-rayed to confirm the accuracy of the excision. Patient demographics, clinical and radiological data, operative details, accuracy of localisation, histopathological assessment and subsequent management were recorded.

Results: Accurate removal of the suspicious lesion was confirmed in 70 of 71 patients. One patient required a repeat localisation procedure.

Conclusion: We have found ROLL to be an accurate and easily reproducible technique in localising impalpable radiological abnormalities, which has logistical and practical advantages over other localisation techniques.

THE EARLY MANAGEMENT OF HYPERTRIGLYCERIDAEMIA IN ACUTE PANCREATITIS

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Introduction: The management of acute pancreatitis associated with elevated triglyceride (TG) levels poses unique problems. Insulin dextrose therapy, plasma exchange and plasmapheresis are the clinical methods for lowering TG levels. Decreasing the TG levels to below 5.65 mmol/l alleviates the abdominal pain and is purported to improve outcome. We analyse our experience with insulin dextrose therapy in this setting.

Patients and methods: Patients presenting with pancreatitis and hypertriglyceridaemia were assessed. All patients with presenting TGs >10 mmol/l were monitored for resolution to a level below 5.65 mmol/l at days 3 and 5. Patients with TG levels in excess of 10 mmol/l were treated with standard therapy (npm and intravenous fluid) or 5% dextrose and 10 units of insulin infusion.

Results: In the period June 2001 to April 2008, there were 434 admissions of 381 patients with a diagnosis of acute pancreatitis and 24 (6%) had hypertriglyceridaemia in excess of 10 mmol/l at admission. Standard therapy was used in all patients and in 5 patients it was the sole therapy. Dextrose and insulin infusion was used in 19 cases. Two patients died prior to repeat estimation. On day 3, 7(32%) of the measured triglyceride levels had fallen below 5.65 mmol/l and on day 5 all had decreased dramatically though in 4 (17%) levels remained above 5.65 mmol/l; 1 of these patients died.

Conclusion: Standard therapy was equivalent to the use of dextrose and insulin in the resolution of hypertriglyceridaemia. Our morbidity and mortality is similar to the levels quoted when plasmapheresis was used in other centres.

ABDOMINAL SURGICAL SITE INFECTION RISK FACTORS AND FREQUENCY IN HARARE TEACHING HOSPITALS

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Aim: This study aimed at determining risk factors for surgical site infections and their frequency at the Harare teaching hospitals for the period May 2007 to June 2008.

Background: Surgical site infections are among the most common complications of abdominal surgery. The associated morbidity prolongs hospital stay and increases hospital cost. Risk factors may be related to age, immunosuppression, wound class, duration of operation, ASA score, prophylactic antibiotics, blood transfusion, use of steroids and smoking.

Materials and methods: A prospective observational study was carried out on 285 patients admitted for elective and emergency abdominal surgery. Patients were followed up for 30 days. Data were collected through pre- and postoperative examinations and telephone follow-ups and recorded on data collection sheets. Of 285 patients 141 (49%) consented to be tested for HIV infection. Student's test, the chi- square test and regression analysis were used for statistical evaluation.

Results: Of the 285 patients in the study group, 232 (81%) were general surgical patients and 53 (19%) were gynaecological patients. There were 158 males (55%) and 127 (45%) females. Operations performed during the day were 195 (68%) and 90 (32%) were performed at night. Elective operations were 55 (19%) and 230 (81%) were emergency operations. Abdominal surgical site infections were detected in 74 (26%) of patients. Wound class, pre- and postoperative blood transfusion, ASA score were associated with SSI ($p<0.05$). The use of prophylactic antibiotics was associated with reduced rates of infection ($p<0.05$). The wound class infection rates were as follows: clean 9%, clean-contaminated 24%, contaminated 23% and dirty 44%. Out of 97 tested non-HIV-infected patients 24 (25%) developed SSI. Forty-four patients were HIV infected and 23 (52%) of these developed SSI ($p<0.05$). Co-morbidity, use of steroids and smoking were not associated with SSI. Superficial infections were 55 (74%), deep infections were 18 (24%) and organ/space infections 1 (2%). The mean time of detection of SSI was 6±2 days after surgery. The management instituted were as follows: dressings 8 (12%), dressings and antibiotics 40 (58%), dressings, antibiotics and surgical intervention 21(30 %). The outcome was as follows: healed in less than 30 days 52 (74%), healed after 30 days 13 (19%) and death in less than 30 days directly attributable to SSI 5 (7%). The mean hospital stay for non-infected patients was 11±10 days. It increased to 22±10 days in infected patients ($p<0.05$).

Conclusion: A high ASA score, pre- and postoperative blood transfusion, a high wound class and HIV infection were risk factors for SSI, resulting in doubling of hospital stay.

WHO SHOULD OPERATE ON NEPHROBLASTOMAS? QUESTION STILL NOT SOLVED

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Purpose: Since there had not been a dedicated paediatric surgeon in Bloemfontein until 2003, more or less anyone operated on Wilms' tumours. In a study done in 2003 we showed that urologists' patients in our institution did best when compared with outside surgeons and academic, non-paediatric general surgeons. We revisited this scenario and looked at 36 new patients operated on between 2003 and 2007.

Methods: We retrospectively looked at 36 patients who had nephrectomies done for nephroblastomas from 2004 until 2007. The relapse and death rate were compared, taking into account the staging of the tumours.

Results: No outside surgeons performed any operations this time round. The paediatric surgeons performed 31 nephrectomies and the urologists 5. The spread between stages 1/2 and 3/4 was according to average for the surgeons (68/32%), but favoured the urologists (80/20%). Only 1 primary operation was done for a bleeding tumour (urology). The urologists had 1 relapse (20%) and no deaths (0%), while the surgeons had 2 relapses (6%) and 8 deaths (26%). Because of the small numbers done by the urologists, we combined the numbers with those from the previous study: the total was now 95. There were 11 (12%) relapses and 20 (21%) deaths.

Conclusion: Our conclusion is that this procedure should be done in a tertiary, academic institution, where all the parameters are controlled. The second observation is that the occasional paediatric surgeon (adult surgeon) should also abstain from this operation. As far as the urologists and general paediatric surgeons are concerned: Is it merely a question of who does most?

PROGNOSTICATION IN MALIGNANT GERM CELL TUMOURS

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Purpose: To assess the prognostic factors (tumour markers, histological type, site, age and stage) in malignant germ cell tumours in childhood.

Methods: A retrospective study of 49 patients was done. The histological type, tumour markers, site and age were analysed based on the staging, and stage was analysed based on the outcome.

Results:

1. *Tumour markers*: 37 patients had tumour markers (AFP, BHCG) in various combinations done. No (0) stage I or II had any rise in tumour marker. 68% of stage III had a rise in one or more tumour markers, as did 60% of stage IV.
2. *Histological type*: 13% of immature teratomas were stage III (the rest were not staged); 7% of endodermal sinus tumours were stage I, 73% stage III and 20% stage IV; 18% of dysgerminomas were stage I, 9% stage II, 55% stage III and 18% stage IV.
3. *Site*: 26% gonadal tumours were stage I, 4% stage II, 48% stage III and 17% stage IV; 11% of sacral tumours were stage III and 22% were stage IV – the rest were not staged.
4. *Age:* 34 patients' stage was known. Their ages ranged from less than 1 year to 14 years, mean 6.9 years. There was no correlation between age and stage.

5. *Stage:* 100% of stage I are doing well (alive with no relapse); stage II could not be studied (absconded); 21% of stage III died and 50% relapsed; 83% of stage IV died and 17% relapsed.
Conclusions: Tumour markers did not rise with early stages of these tumours. Only stage III and IV had any rise in anyone of the 2 tumour markers done. A firm conclusion cannot be made regarding the histological type, but it seems that endodermal sinus tumours and dysgerminomas tend to be of later stages. Other than in other studies, gonadal tumours did not have favourable staging and outcome in our study. Also against findings in other studies, age was not a good indicator of prognosis. Staging remains a good prognostic tool in these tumours: 100% survival rate in stage I, the only stage II absconded after 3 years looking well, 21% of stage III died and 50% relapsed, and 83% of stage IV died, while 17% relapsed.

MUCIN EXPRESSION IN CYSTIC NEOPLASMS OF THE PANCREAS

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Introduction: Mucins are both secreted and form gels on epithelial surfaces or membranous, whereby they are involved in the apical polarity of cells that line ducts and tracts. MUC4, a trans-membrane mucin, is a diagnostic marker of adenocarcinoma of the pancreas.
Aim: To determine the expression of mucins in mucinous and serous cystic neoplasms and solid pseudopapillary neoplasms of the pancreas.
Method: We investigated mucin expression in solid pseudopapillary neoplasm, mucinous cystic neoplasm and serous cystic neoplasms. Formalin-fixed paraffin-embedded tissues were retrieved from the archives of the Division of Anatomical Pathology, Groote Schuur Hospital. H&E stains and histochemistry for sulphated and acidic (HID/AB) and neutral (PAS/AB) mucins were performed. Mucin expression was detected with antibodies to MUC1, MUC1 core, MUC2, MUC4, MUC5AC, MUC5B and MUC6.
Results: Eleven of the 17 cystic neoplasms showed a predominance of sialomucin. Histochemically the solid pseudopapillary neoplasm showed no mucin positivity. Intra-cytoplasmic MUC5AC was seen in the majority of mucinous cystic neoplasms. MUC5B, MUC1 and MUC1c were seen in a minority of cases with the latter two staining the membrane. The solid pseudopapillary and serous cystic neoplasms did not show any mucin expression by histochemistry. The serous neoplasms by contrast showed predominantly membranous expression of MUC1 and MUC1c. The comparison of MUC1 and MUC1c in mucinous and serous cystic neoplasms revealed a consistently higher expression in the serous neoplasms. There was no expression of mucins in the papillary cystic neoplasms.
Conclusion:
1. The solid pseudopapillary neoplasm is consistently negative for mucins.
2. The serous neoplasms had a consistently higher expression of MUC1 and MUC1c than the mucinous neoplasms.

INVESTIGATING THE ULTRASTRUCTURE OF PLATELETS OF HIV PATIENTS TREATED WITH THE IMMUNO-REGULATOR, CANOVA: A QUALITATIVE SCANNING ELECTRON MICROSCOPY STUDY

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Introduction: In view of the well-documented evidence that HIV strains are showing a progressive resistance to the available antiretroviral medication, researchers have turned to the possible use of alternative drugs such as immunomodulators to enhance the immune system of patients infected with HIV.

Canova is an immunomodulator of herbal origin and is known to stimulate the host defence mechanism against several pathological states by activating the immune system. Previous SEM studies have already revealed the disruptive influence of HIV on platelet morphology, like membrane blebbing and ruptured platelet membranes, which is indicative of apoptosis or programmed cell death.[1]
Aim: The aim of this comparative analysis was to investigate the effect of HIV on the ultrastructural morphology of the platelets from patients treated with the immunomodulator, Canova, compared with control individuals and HIV patients not on the Canova treatment.
Method: Blood was drawn from the individuals and the coagula were formed by adding human thrombin to the platelet-rich plasma. After the fibrin clots were washed, the clots were duly prepared; before the material was examined with a Jeol 7500F scanning electron microscope.
Results: Only minor morphological changes were observed when the fibrin networks from the control, untreated and treated HIV patients were compared. This observation suggests that HIV does not impact on the fragility of the fibrin networks. However, whereas the fibrin-bound platelet aggregates of the untreated HIV patients showed the classic bleb-like bulges and ruptured platelet membranes, the blebbing was far less pronounced in the treated group where there were large areas of smooth intact membranes with minimal disturbance of the ultrastructural cyto-skeletal morphology.
Conclusion: These results appear to provide further ultrastructural evidence for the results seen in previous research, where it was found that Canova protects the immune system of immunocompromised patients by preventing the devastating cyto-destructive effects of HIV disease.[2]

1. Pretorius *et al. Ultrastructural Pathol* 2008; 32: 75-79.
2. Smit *et al. Ultrastructural Pathol* 2008; 32: 147-152.

ULTRASTRUCTURAL APOPTOTIC PLATELET AGGREGATES AND DEFECTS IN FIBRIN NETWORKS IN A PATIENT WITH RENAL CLEAR CELL ADENOCARCINOMA

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The incidence of renal cell carcinoma (RCC) seems to be increasing, partly as a result of incidental detection of small tumours, but despite new technology and management options, the mortality rate is still ~40% (Kontak and Campbell, 2003). Most of the important prognostic features take account of tumour-related factors. Thrombocytosis has been recently suggested to indicate a poor prognosis in patients with various malignancies including RCC (Bensalah *et al*., 2006). The question arose whether platelet morphology could provide information on the implications on thrombocytosis. In this paper we report on a case with RCC, thrombocytosis and apoptotic circulating platelets.

A 47-year-old man presented with weight loss, haematuria and a left renal mass, which was a clear cell renal carcinoma with multiple liver, pulmonary and bone metastases. He also had thrombocytosis (414×10^9/l). Fibrin clots were prepared for scanning electron microscopy (SEM) from blood collected from the patient and 3 controls and examined on a Zeiss Ultra 55 FEG SEM.

The platelet aggregates contained multiple breakages in the platelet membrane, showing a pock-marked, crenated, prune-like appearance as opposed to the smooth, rounded globular membrane of the controls. Overall, the ultrastructural morphology of the fibrin-bound platelet aggregates had a disrupted cytoskeletal architecture which appeared to be similar to the apoptotic changes of programmed cell death as described by Bornman *et al.* (2007) and Pretorius *et al.* (2008). In view of increased platelet activation associated with RCC, the apoptotic platelets might represent platelets after activation, aggregation, contraction and secretion had occurred. These features may also be a distinct ultrastructural haematological manifestation of a previously unidentified paraneoplastic syndrome. The use of apoptotic platelets in patients with RCC is now being studied as a possible prognosticator.

IS OESOPHAGEAL STENTING THE ANSWER? A REPORT FROM A SECONDARY HOSPITAL IN THE DEVELOPING WORLD

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Introduction: As rates of oesophageal cancer increase around the world so do studies evaluating the best method of palliation, given the poor outcomes associated with this malignancy. It is increasing in South Africa at an alarming rate. Most of these studies have taken place in the developed world and therefore do not take into account the social and economic constraints associated with the developing world. We present a retrospective study from Tshepong Hospital, a secondary hospital in South Africa.
Patients and methods: We retrospectively reviewed the data from 29 patients between February 2005 and January 2008. All patients presented with inoperable oesophageal cancer and were palliated with either stenting (N=1) or radiotherapy (N=12). We compared number of admissions, length of hospital stay and time from first seen to intervention as primary outcomes. Secondary outcomes were time from first seen to biopsy, procedure-related complications and median survival following initial intervention.
Results: There was no significant difference between the two groups with respect to age and days to biopsy. There was, however, a significant difference in number of admissions, length of hospital stay and days to procedure. There were no major complications reported as a result of brachytherapy. One patient in the stent group complained of chest pain, in one patient there was tumour overgrowth requiring restenting, and in one patient the stent migrated but still maintained patency. A further patient was excluded from the study because she died in theatre during stenting.
Discussion: There have been studies showing the superiority of brachytherapy over stenting with regard to long-term palliation and number of complications. However in our setting, given socio-economic constraints such as problems with follow up, transport and administrative errors, patients were delayed when it came to receiving definitive palliation. Given the short-term survival expected in these patients, stenting may be a more reasonable option to consider given the decreased time to final intervention and hospital stay in patients with a poor prognosis. Adopting a prognostic score can help in identifying these patients.

FAMILIAL PALMAR-PLANTAR HYPERKERATOSIS ASSOCIATED WITH CARCINOMA OF THE OESOPHAGUS: A REPORT ON THE FIRST SOUTH AFRICAN FAMILY

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Background: Squamous cell carcinoma (SCC) of the oesophagus is endemic among Africans in South Africa and yet no familial or genetic predisposition has been described for its development. The rare familial palmar-plantar hyperkeratosis (FPPK) or tylosis is the only genetic syndrome that has been described in association with SCC of the oesophagus.
Aim: To study the family of an index patient (DM) with palmar-plantar hyperkeratosis presenting with SCC of the oesophagus.
Method: A family tree and medical history of the family of DM was con-

structed by interview of the patient and some living relatives. First-degree relatives were examined for palmar-plantar hyperkeratosis and consenting adults were subjected to upper GI endoscopy and biopsy as necessary.
Results: Four asymptomatic members of the family were evaluated clinically and endoscopically. One M56 had early oesophageal SCC confirmed histologically and another F37 had gastric metaplasia. Both had hyperkeratosis. One teenage girl had hyperkeratosis but normal endoscopy. The 4th adult female had normal skin and endoscopy. Family medical history revealed 3 further members with hyperkeratosis and 2 deaths from possible oesophageal cancer. Our patients have so far declined treatment for the past 18 months despite numerous explanations of the nature of their condition.
Discussion: FPPK is a rare familial syndrome associated with SCC of the oesophagus and sometimes of the skin or bronchus. Other features of FPPK include oral leukoplakia and abnormal differentiation of oesophageal epithelium. One member of the study family showed gastric metaplasia. Very few cases have been described in the literature from the UK, US, Australia, Europe and India; some of which could be traced to one family or region. The current study is the first to be reported from an African family and the first in South Africa. Genetic studies on the family are underway.
Conclusion: Although FPPK is rare, it has a strong association with SCC of the oesophagus with the risk of SCC of the oesophagus estimated at 95% at age 65 years. It warrants regular screening of all relatives for early detection and treatment of cancers.

PHYSIOLOGICAL CHARACTERISATION AND OUTCOMES OF PATIENTS AFTER EMERGENCY ROOM THORACOTOMY (ERT): RETROSPECTIVE REVIEW

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Introduction: ERT is a resource-intensive, high-risk procedure where rapid decision making is essential.
Aim of study: To audit the outcomes of patients who underwent ERT to identify what group of patients obtained the most benefits from this procedure.
Method: Retrospective review of data collected on patients who underwent ERT, between 1 February 2005 and 31 March 2008. Variables include: mechanism of injury, cavity involved, degree of physiological and metabolic derangement present at time of ERT, revised trauma score (RTS), injury severity score (ISS), and outcome (30-day hospital mortality).
Results: The TU managed 6 720 cases of major trauma in study period; 61 underwent ERT (1.31%). Five sub-groups were identified: isolated stab chest (*N*=19), isolated gunshot (GSW) chest (*N*=6), combined thoraco-abdominal stab (*N*=9) and GSW (*N*=23) and blunt trauma (*N*=4). The majority of patients were young healthy males (mean age 29 years). Mortality was high (88.2%), but patients with stab chest trauma seem to fare better than those with combined thoraco-abdominal or sub-diaphragmatic trauma.

Sub-groups mechanism	Survivors (*N* (%))	Non-survivors (N (%))
Pure stab chest (*N*=19)	**8 (13.1)**	**11 (18)**
Pure GSW chest (*N*=6)	**1 (1.6)**	**5 (8.2)**
Combined thoraco-abd. stab (*N*=9)	**-**	**9 (14.7)**
Combined thoraco-abd. GSW (*N*=23)	**2 (3.2)**	**21 (34.4)**
Blunt (*N*=4)	**-**	**4 (6.5)**

Physiological – metabolic parameter	Value (mean, SD)
HR	**84±40**
SBP	**50±40**
RR	**12±12**
pH	**7.2±0.2**
BE	**–12±7**
Lactate	**10±6**

All patients exhibited severe metabolic and physiological derangement on arrival, as demonstrated by the mean values above.
Conclusions: Although this series is small, results tend to support the idea that ERT should be reserved for patients with a potential cardiac or pulmonary injury. Ongoing data collection analysis may offer better insight.

CONSERVATIVE MANAGEMENT OF BLUNT AND PENETRATING ABDOMINAL INJURIES AT AN URBAN TRAUMA UNIT

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Introduction: Conservative management of stable patients without hollow viscus injury is well established. Availability of resources and increased workload present a challenge in optimising outcome.
Aim: Audit outcomes of patients with abdominal trauma managed conservatively at the Johannesburg Trauma Unit.
Method: Prospectively collected data from both penetrating and blunt abdominal trauma patients from 01/10/07 to 30/04/09. Data analysed included: demographics, injuries sustained, haemodynamic parameters, fluid administered during resuscitation, transfusion requirements during hospital stay, ISS, NISS, radiological investigations, mortality and morbidity outcomes.
Results: Ninety-one (91) patients were identified for the study, 78 (85.7%) of whom were males. Median age was 29, ISS and NISS were 18 and 24 respectively. The majority of the patients sustained blunt trauma (68.4%). Initial median Hb was 12.7 g/dl. Sixteen patients (17.6%) required packed cell transfusion in the first 24 hours and 7 (7.7%) in the subsequent 24 hours. All patients had a contrast CT abdomen. Liver was the common solid organ injury (76.9%), and the chest the most common associated region involved (47.3%). Repeat CT scan was performed in 10 (11%) patients only. Angio-embolisation was performed in 4 (4.4%) patients with good results. Percutaneous drainage was required in 1 patient for bile leak. Only 1 patient failed conservative management. Two patients died from the head injury.
Conclusion: Conservative management of both blunt and penetrating abdominal solid visceral injury was successful in majority of our patients. Ongoing monitoring is essential to optimise outcome. Selective use of follow-up radiological examination is safe.

Abdominal injuries	Totals	Grading	Numbers
Liver	**70**	**AIS 1 & 2**	**43**
		AIS 3 & 4	**27**
Spleen	**20**	**AIS 1 & 2**	**13**
		AIS 3 & 4	**13**
Renal	**23**	**AIS 1 & 2**	**5**
		AIS 3 & 4	**18**

Complications		
Failed conservative treatment	**1**	**Operated on successfully**
Delayed major bleed	**4**	**Embolisation**
Bile leak	**1**	**Percutaneous drainage**
Death	**2**	**Both related to head injury**

INJURY PATTERNS IN FALL FROM HEIGHT (FFH) PATIENTS: OUTCOME STUDY AT THE JOHANNESBURG HOSPITAL TRAUMA UNIT

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Introduction: FFH causes a varied pattern of injury presenting a management challenge to the treating clinician. Outcomes in FFH depend on height, duration of contact, type of surface and organ systems involved.
Aim: To analyse the outcome in FFH patients managed in an urban trauma unit.
Methods: A retrospective series review of prospectively collected data between January 2005 and September 2008. Data were retrieved from the Trauma Bank at the Charlotte Maxeke Hospital Trauma Unit. Data analysed included age, sex, height fallen, haemodynamic status, injury patterns, ISS and in-hospital mortality outcomes. ISS was classified into mild (<16), moderate (16 - 24) and severe (>24).

Region	Mild (<16)	Moderate (16 - 24)	Severe (>24)
Head	**46**	**87**	**182**
Upper limbs	**67**	**19**	**20**
Chest	**20**	**12**	**61**
Abdomen	**7**	**23**	**36**
Spine	**81**	**19**	**38**
Lower limbs	**105**	**18**	**34**

Category	ISS <16	ISS 16 - 24	ISS >24
Total per group	**292**	**68**	**107**
Percentage distribution	**62.5%**	**14.6%**	**22.9%**
In-hospital GCS <9	**29**	**21**	**59**
Died	**3**	**6**	**45**

Category	Pre-Hospital BP<90	In-Hospital BP<90	Total Falls
ISS	**24**	**22**	**9**
Died	**16**	**13**	**54**
Died %	**31%**	**20%**	**11.5%**

Results: 466 cases were identified. The mean age was 26 years with 369 (79%) being male and 97(21%) female. The median height fallen was 8.5 metres. Common injuries were head (67%), lower limbs (33.7%) and spine (29.6%) (Table). Median ISS was 9 (range 4 - 66) with 62.5% mild, 14.3% moderate and 22.9% severe (Table). The overall mortality was 54/466 (12%), with 45 having an ISS >24. Pre-hospital and in-hospital hypotension (systolic <90 mmHg) was associated with a mortality of 31% and 25%, respectively (Table). In-hospital GCS <9 was present in 59/107 with ISS > 24 (Table).
Conclusions: FFH is a multisystem pattern of injury with head injuries being the most common in our series. Mortality was highest in the patients with an ISS >24. Patients who presented with pre-hospital and in-hospital hypotension (systolic <90 mmHg) were associated with a worse outcome. A GCS <9 in-hospital was associated with a worse outcome.

BURN MORTALITY AT PELONOMI HOSPITAL BURNS UNIT, BLOEMFONTEIN, SOUTH AFRICA

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Introduction: Burns, arguably the most devastating of all injuries, leave the survivor with lifelong disability. Globally, mortality from burns has remained unacceptably high especially in the low-income countries.
Aim: The aim of this study was to answer the questions: What is the mortality and LD 50 in the 'adult' section of the Pelonomi burns unit? What are the important contributing factors and what strategies are needed to favourably influence our mortality?
Methodology: This was a chart review of 109 patients who were admitted between March and July 2004, 2005 and 2006 and who filled the inclusion criteria. Study permission was obtained from the UOFS ethics committee and the clinical director, Pelonomi Hospital.
Results: 109 patients could be included. There were 26 deaths, yielding an overall mortality of 23.8%. 58% of the patients who died were older than 50 years. Both genders were equally represented. The LD50 was 41% TBSA and 43.3% deaths occurred in the 1st 7 days (the resuscitation - post-resuscitation phase).
Conclusion: Our mortality rate is unacceptably high but is similar to that reported from other lower-income countries. We should manage our days 0 - 7 more effectively and should recognise that the older patient is exceptionally vulnerable to burn death.

CALCANEAL X-RAYS: SHOULD THEY BE DONE ROUTINELY IN FALL FROM HEIGHT (FFH) PATIENTS?

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Introduction: FFH is associated with an increased incidence of fracture calcanei. Our protocol supports liberal use of radiological investigations in order to avoid missed fractures, especially in patients with a clinical suggestion of calcaneal fracture, altered level of consciousness and associated local tissue injury.
Aim: To assess the yield of calcaneal radiological investigation in patients with a fall >2 metres.
Methods: A retrospective analysis of prospectively collected data between January 2005 and September 2008. All patients who fulfilled the criteria were classified as priority 1 patients and were resuscitated according to the unit protocol. Data were collected from patient records and from the Trauma Bank at Charlotte Maxeke Hospital Trauma Unit. Analysed data included age, sex, ISS, NISS, GCS, height fallen and calcaneal X-ray findings and outcomes.
Results: 466 FFH patients were identified. There were 369 males and 97 females. Mean age was 26 years. Median height fallen was 8.5 metres. Two hundred and forty-one (51.7%) patients were assessed clinically and found not to have evidence of calcaneal injuries. (No calcaneal X-rays were done.) The remaining 225 (48.3%) had calcaneal X-rays according to the unit protocol (Table). Calcaneal fractures were confirmed in 37 (16.4%) of the 225. In patients with GCS <3 the yield of positive radiological findings was 12.1% compared with those with GCS >13 with a yield of 18.4%. On review and follow-up no missed injuries were identified in either group.
Conclusions: Our protocol of selective calcaneal radiological investigation is safe; however, it is still associated with a low yield of 1:6.

Procedures	Normal	Positive	No calcaneal X-rays done
Cal X-ray	**188**	**37**	**241**
Percentages	**83.6% (of all X-rayed)**	**16.4% (of all X-rayed)**	**51.7% (of all patients)**

THE ROLE OF A REPEATED ABDOMINAL SONOGRAPHY IN BLUNT INJURY

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Introduction: FAST may enhance clinical examination of stable blunt trauma patients.
Aim: To investigate the accuracy of repeated-delayed FAST, in the subgroup of stable blunt trauma victims, compared with primary normal FAST.
Methods: Retrospective review of prospectively inserted data (Feb 2005 - Feb 2009) of 482 patients who sustained a fall from height. Data collected: demographics, GCS, HR, RR, sBP, RTS, AIS, FAST, repeated FAST, CT scans and diagnosed injuries.
Results: 156 stable patients with GCS 15. Mean age 30 years. Average admission HR, sBP and RR were 81 b/min, 127 mmHg and 20/min respectively. Average RTS and AIS were 7 and 5 respectively.

Ninety patients underwent FAST during resuscitation, and 80 patients had a negative FAST. Ten patients with positive FAST underwent a CT scan (negative for 2 patients).

Nine patients underwent repeated FAST within 4 - 6 hours (8 negative) – no further investigation. One patient with positive repeat FAST had grade II liver laceration on CT scan. Predictive parameters for repeat FAST: sensitivity 78%, specificity 99%, PPV 88%, NPV 98%, overall accuracy 97%.
Conclusions: FAST is a reliable screening tool for stable blunt injury. Negative repeat FAST is sufficient to rule out significant abdominal injury.

DEVELOPING THE ELECTRONIC OPERATIVE RECORD CAPABLE OF GENERATING A SURGICAL TRAINEE LOGBOOK

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Background: Logbooks form an important part of the trainee surgeon's personal portfolio. Currently these logbooks are compiled by trainees in a variety of formats. No electronic national database of surgical trainee logbook data exists. This study examines the electronic operative record as a possible source for automatic logbook generation.
Method: A minimum dataset for operative notes was defined, and a database and user interface developed. The program was deployed on a computer in the operating theatre and operation notes were entered by registrars and consultants following surgery. A printed copy was produced for the patient's chart. Data entry was validated during input to ensure high-quality data. Operative records for an index operation, using the Royal College of Surgeons (RCS) standards, were compared pre- and post-electronic operative record. User satisfaction using an electronic system was measured using the standardised QUIS questionnaire. Trainee logbooks and consolidation sheets were automatically generated and measured against published CMSA standards for trainee logbooks.
Results: Electronic operative notes were 99% compliant to RCS standards as opposed to 71% for paper records. The questionnaire for user interaction satisfaction (QUIS) scored an average of 7.23 out of 9. Trainee logbooks were automatically generated in standard format and consistently matched the standard as set out by the CMSA.
Conclusions: An electronic database produces better quality operative records. Users found the system easy to use and quality, validated data were captured. Trainee logbooks were compliant with current published standards and were generated automatically on demand.

SURGICAL REGISTRAR PORTFOLIOS: WHAT INFORMATION DO WE GET?

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Introduction: In 2002 the Colleges of Surgeons of the CMSA introduced the portfolio as a prerequisite for FCS candidates. The portfolio is intended to

record academic progress, operative experience, and formative assessment during training. The prescribed format for the portfolio is detailed on the CMSA website.

Methods: 24 recent portfolios were evaluated in terms of candidate demographics, layout, duration of logbook and exposure to fundamental emergency and elective procedures.

Results: No two logbooks were presented in the same manner. The length of training varied from 40 to 77 months. Only 7 candidates complied with College regulations by submitting both rotation and overall consolidation sheets. Procedure exposure according to the categories: assistant, supervised surgeon, unsupervised surgeon were not accurately recorded. Hence total exposure in all categories is presented. The procedures performed expressed as mean and (range) were comparable between all centres for emergency operations: laparotomy 148 (66 - 298), appendicectomy 31 (17 - 83). For elective operations a lot of variance was found: open cholecystectomy 13 (1 - 30), thyroidectomy 11 (0 - 30), with 6 individuals being involved with less than 5 cases in either of these operations. Laparoscopic surgical experience was confined to cholecystectomy, with a mean of 21 cases (8 - 63). The mean for gastroscopy was 84 (0 - 441), with 6 individuals being involved with less than 5 endoscopies.

Conclusions: The format of the portfolios is not standardised. Candidates were not diligent in their data capture regarding their role in the procedure. Only one-third presented consolidated sheets in the prescribed format. FCS candidate portfolios need better regulation and quality control. Trends observed in exposure suggest that elective exposure in certain operations could be considered sub-minimal.