



SCHOOL OF CHILD & ADOLESCENT HEALTH
UNIVERSITY OF CAPE TOWN



ANNUAL RESEARCH DAYS 2006

**CELEBRATING 50 YEARS OF RESEARCH AT RED CROSS
CHILDREN'S HOSPITAL**



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Programme and Abstract Book

24th & 25th October
ICH Building, 7th Floor
Red Cross Children's Hospital

CPD Points

Tuesday, 24th October 2006

Wednesday, 25th October 2006

4 points

7 points

Please sign the attendance register on both days to claim your points.

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Title: PERINATALLY-INFECTED HIV POSITIVE CHILDREN AFTER ONE YEAR ON ANTIRETROVIRAL MEDICATION- WHAT ARE WE LEARNING?

Authors: Nassen R, Ward C, Flisher AJ

Department: Division of Child and Adolescent Psychiatry
Red Cross Children's Hospital? university of Cape Town

Introduction The arrival of highly active antiretroviral therapy (HAART) about a decade ago dramatically changed the nature of AIDS from a rapidly fatal disease to a chronic illness. In the face of improved survival rates a new challenge of understanding the underpinnings of the behavioural and emotional disturbances in HIV positive children on HAART has emerged. Possible causes for such disturbance include HIV disease itself, psychosocial stressors and possible neurotoxic effects of HAART.

Methods. A retrospective record review of a cohort of perinatally- infected HIV positive children aged 6 - 13 years was conducted. All had presented with emotional and behavioural problems as well as scholastic difficulties, subsequent to an initial improvement after initiating HAART one year previously. The children were assessed and managed at the Neuropsychiatric Clinic at Red Cross Children's Hospital. The children's medical, neurological, cognitive and psychiatric presentations are described as well as the course of symptom development and response to interventions.

Results Analysis suggests various aetiologies for the behavioural disturbances. The predominant causes can be located in the psychosocial environment and/or the HIV disease itself. It would appear that adverse effects of anti-retroviral medication do not constitute a prominent cause for the behavioural disturbance.

Conclusion. Despite relatively long-term use of antiretroviral therapy, clinically significant behavioural problems appear to persist. This could be a consequence of the fact that antiretroviral medications were started relatively late in this particular cohort (between five to ten years after diagnosis) or that the behavioural profile is a manifestation of the natural course of the disease despite antiretroviral medication use.

Address: Division of Child and Adolescent Psychiatry, Red Cross WMC Hospital, Klipfontein Road, Rondebosch 7700, Cape Town, South Africa.

Title: THE PLASMA CONCENTRATIONS OF LOPINAVIR IN SOUTH AFRICAN CHILDREN RECEIVING LOPINAVIR/RITONAVIR-BASED HAART WITH AND WITHOUT RIFAMPICIN-BASED TB TREATMENT

Authors: Yuan Ren, Gary Maartens, Peter Smith, James Nuttall*, Brian Eley, Greg Hussey, Simon Schaaf, Marianne Willemse, Tammy Meyers, Claire Egbers, and Helen McIlleron

Department: *School of Child and Adolescent Health and Red Cross Children's Hospital, University of Cape Town, South Africa

Objective: Concomitant administration of lopinavir/ritonavir and rifampicin is common for treatment of HIV/TB co-infected South African Children. Plasma lopinavir level can be reduced by rifampicin, but evaluation of the pharmacokinetic drug-drug interaction between these two drugs in paediatric population is inadequate. We compared the pharmacokinetics (PK) of lopinavir in TB/HIV co-infected patients taking lopinavir/ritonavir (1:1) and rifampicin-based TB treatment, with lopinavir levels in HIV-infected patients taking Kaletra®, but not receiving TB treatment.

Methods: Two parallel groups with 15 patients in each group, 8 blood samples of each patient were taken from pre-dose to 12 hours following drug ingestion. Plasma lopinavir levels were determined by the validated LC-MS/MS methods. The PK of lopinavir was characterized from concentration-time curves by non-compartmental analysis.

Results: The preliminary results are based on the 10 TB/HIV co-infected patients receiving lopinavir/ritonavir (1:1) with concomitant rifampicin-based TB treatment and 15 HIV infected patients only receiving Kaletra®. Median C_{max} for patients with and without TB treatment are 11.2 mg/l [IQR: 7.02-12.96] and 14.2 mg/l [IQR: 11.9-23.5] (p= 0.0246), respectively. Median AUC are 73.6 mg.h/l [IQR: 47.6-105.2] vs. 113.7 mg.h/l [IQR: 78.8-168.6] (p= 0.0522). Median C_{min} are 4.02 mg/l [IQR: 2.89-7.66] vs. 4.64 mg/l [IQR: 2.32-10.4] (p= 0.7393). Median half-life are 9.5 hr [IQR: 4.54-17.61] vs. 4.86 hr [IQR: 3.82-8.29] (p= 0.1492).

Conclusions: Large inter-patient variability was observed. There was a significant reduction of C_{max} in the patients receiving lopinavir/ritonavir (1:1) with rifampicin compared with the patients receiving only Kaletra®. This study confirmed that the reduction of lopinavir levels by rifampicin can be overcome by adding additional ritonavir to Kaletra®. Lopinavir C_{min} levels of all 25 patients were above the minimum therapeutic level, but underpowered to show a significant reduction of C_{min} between two groups.

Title: GROWTH AS A SURROGATE MARKER FOR OUTCOMES OF CHILDREN ON HAART IN RESOURCE-LIMITED SETTINGS

Authors: ^{a,b}Heather B Jaspan, ^aAlison Berrisford, ^{a,b}Paul Roux, and ^cAndrew Boulle

Department: ^aGroote Schuur Hospital Department of Paediatrics
^bSchool of Child and Adolescent Health, University of Cape Town
^cSchool of Public Health and Family Medicine, University of Cape Town

Objectives: Growth is used as a surrogate marker for efficacy of antiretroviral therapy in children in developed countries. In underdeveloped countries, growth is confounded by a multitude of factors. This study aims to evaluate whether growth correlates with virological and immunologic outcomes of children on HAART in South Africa.

Methods: A retrospective folder review of all children on HAART through Groote Schuur Hospital infectious diseases clinic was performed. Laboratory data included viral load and CD4 percent absolute numbers were collected 6 monthly. Weight and height were included from 6 monthly visits +/- one month. Weight for Age Z score (WAZ) and Height for age Z score (HAZ) were calculated using WHO standard curves. Data were analysed using Stata 9.

Results: 370 children were included in the analysis. The median baseline age was 26.9 months. The median baseline CD4 count was 504 cells/m³ and median CD4 percent was 13%. Median baseline WAZ and HAZ were – 2.7 and –3.0 respectively. There were obvious improvements in all parameters after the initiation of HAART. VL suppression was greatest at 6 months post-initiation of HAART, whereas CD4 percent improvement continued through 24 months. WAZ scores improved drastically within the first 6 months of therapy, but continued to improve slowly through 24 months. Improvements in HAZ were more gradual yet sustained through 24 months of therapy. In a logistic regression model predicting virologic suppression adjusting for CD4 percentage, age, and starting regimen, anthropomorphic measures had little or no association with virologic suppression (WAZ OR 1.26; 95%CI 1.02-1.06 and HAZ OR 1.10; 95%CI 0.94-1.29)

Conclusions: Despite profound improvements in anthropomorphic measures after initiation of HAART, WAZ and HAZ are not good surrogate markers for successful virological suppression in resource-limited settings. Access to laboratory measures is necessary to accurately monitor therapeutic success.

Title: MORTALITY IN HIV-INFECTED SOUTH AFRICAN CHILDREN WITH ACCESS TO ANTIRETROVIRAL THERAPY

Authors: Marco Zampoli, Mary- Anne Davies, James Nuttall, Brian Eley.

Department: School of Child and Adolescent Health and Red Cross Children's Hospital, University of Cape Town, South Africa

Objective: To describe the pattern and causes of death in children during the first year on highly active antiretroviral therapy (HAART) and identify risk factors associated with mortality when initiating HAART.

Methods: Clinical and laboratory data was collected on all children starting HAART at Red Cross Children's Hospital between August 2002 - June 2005. Children were classified as survivors (alive after 1 year on HAART), early deaths ED (death <4 weeks after starting HAART) and late deaths LD (death 4-48 weeks on HAART). The most likely cause of death (COD) was determined by reviewing clinical records.

Results: Data was available on 479 of 523 children who started HAART. Thirty-seven percent of children started HAART as in-patients, 32% of children were <1 year of age and 98% of children had WHO clinical stage 3 or 4 disease. Median (IQR) baseline CD4% and HIV-1 log₁₀ viral load was 11.9 (7.2-17.7) and 5.58 (5.11-6.13) respectively. Eighty (17%) children died within a year after starting HAART and 38 (48%) were ED. The most common COD was pneumonia (39%). *Pneumocystis jirovecii* (33%), *Cytomegalovirus* (33%), gram negative bacteria (29%), *Staphylococcus aureus* (25%) and *M. tuberculosis* (21%) were the most prevalent pathogens isolated in children dying of pneumonia. The COD was not determined in 27 (34%) children including 9 hospital deaths and all 18 deaths occurring at home. Early deaths were significantly more likely to occur in younger children with higher CD4% who started HAART as in-patients and died in hospital. CD4 count <300 cells/uL and HIV-1 log₁₀ viral load >6.0 were independent predictors of overall mortality.

Conclusions: Earlier identification and treatment of HIV-infected infants is a high priority as the risk of death in symptomatic children remains high despite access to HAART. The CD4% has little value in predicting mortality in symptomatic children starting HAART.

Title: **PRECIOUS MOMENTS - IMPROVING QUALITY OF CARE IN PATIENTS PRESENTING WITH BRAIN TUMOURS IN WARD D1.**

Authors: Manda Appels; Tania de Villiers, Minette Coetzee

Department: Child Nurse Practice Development Initiative – School of Child and Adolescent Health

In ward D1 with its high turnover of patients and variety of sub-specialist surgeons, the team realised that empathy and emotional support was lacking in the care of patients suspected or diagnosed as having brain tumours. Berwick(2004) says the only way to 'fix' healthcare is to bring our practice into the open and to measure the outcomes of our interventions.

In D1 the aim of the project was to support mothers of children aged between zero and thirteen years of age suspected or diagnosed with brain tumours by means of the following:

1. Involving the multidisciplinary team when the diagnosis and prognosis is first communicated with the parents/family.
2. The team would prepare a 'memory box' for each child whether prognosis is good or poor.
3. Parents would be intentionally advised about the practical aspects of ongoing care on discharge home.

The project has been going for almost 10 months with 16 enrolled patients. The process was to involve the multidisciplinary team on admission of the child, when a brain tumour is suspected, so that in the event that the diagnosis is made the child and parent are familiar with the team and will receive ongoing support. This oral presentation will discuss the qualitative evaluation of the project.

Title: ACUTE LYMPHOBLASTIC LEUKAEMIA AT RED CROSS CHILDREN'S HOSPITAL 1995-2004

Authors: A Davidson, P Hartley, F Desai, M Hendricks, W Mathiassen, N Nicholson, M Shuttleworth

Department: Haematology / Oncology Service, School of Child and Adolescent Health, University of Cape Town

Objective: To review the outcomes of children presenting to the Red Cross Children's Hospital Oncology Unit with Acute Lymphoblastic Leukaemia.

Methods: A retrospective analysis was performed on all children diagnosed with ALL in our institution between January 1995 and December 2004. Data was collected from patient folders, and event free survival was calculated by the method of Kaplan and Meier using Statistica 7.1 (Statsoft, Inc. 1984-2005)

Results: There were 139 children diagnosed with ALL. Ninety-three were male (66.9%) and 46 were female (33.1%). Age at diagnosis ranged from 1.26 to 14.86 years, with a median age of 5.48 years. Fifty-eight patients were standard risk (age less than 10 years, white cell count less than 50000, no central nervous system involvement, favourable immunophenotype and cytogenetics, as well as adequate response to induction chemotherapy). The other 81 patients (58.3%) were high risk. Patients were treated with standard risk and high risk protocols based on the United States Children's Cancer Group protocols CCG-1881, 1891 and 1882. Due to historically poor results for black patients, all of the 41 (29.5%) black patients, including nine who were standard risk, were treated on high risk protocols.

Estimated 5-year event free survival for the whole group was 72.2%. High risk patients had an estimated 5-year event free survival of 69.7%, compared to 76.7% for standard risk patients. Central nervous system involvement and adverse cytogenetics conveyed a poor prognosis. Sex and race did not influence survival. Age greater than 10 years, white cell count greater than 50000 and T-cell phenotype (all treated with high risk protocols) were not associated with a worse prognosis in this series.

Conclusions: Improved survival for black patients in this study supports the strategy of treating them with high risk protocols.

Title: **DISTINGUISHING TUBERCULOSIS FROM LYMPHOMA IN HIV POSITIVE CHILDREN.**

Authors: M Hendricks, A Davidson, P Hartley

Department: Haematology / Oncology Service, Red Cross Children's Hospital, Cape Town, South Africa

Six HIV positive children were diagnosed with biopsy proven diffuse large B cell lymphoma at Red Cross Children's Hospital between January 2003 and November 2005.

In four of these children the diagnosis of lymphoma was obscured by proven or suspected tuberculosis. In all four children the diagnosis of tuberculosis preceded the diagnosis of lymphoma. All children received anti-retroviral therapy (HAART).

One child, aged fifteen years had chronic lung disease and clubbing. She developed necrotizing lobar pneumonia and was started on TB treatment. When consolidation persisted a lung biopsy revealed lymphoma.

The other three children had chest X-Rays suggesting miliary tuberculosis. The first, a five year old boy, who presented with a limp, had an ulcerating tuberculin skin test and a lytic lesion in the right acetabulum. He also had an abdominal mass which proved to be a lymphoma on biopsy. The second, also five years old, had been treated for presumed miliary tuberculosis for a year before the diagnosis of lymphoma was made after he presented with an intussusception. At this point the chest X-Ray still showed a miliary pattern. Both these children had a dramatic response to chemotherapy, with clearing of the chest X-Ray, favouring the diagnosis of pulmonary lymphoma rather than tuberculosis.

In the last patient, aged eight years, the chest X-Ray showed a diffuse nodular infiltrate with right middle lobe pneumonia and hilar adenopathy suggestive of tuberculosis. The diagnosis was confirmed on bone marrow trephine. He developed an epigastric mass and died before a biopsy could be performed. Abdominal lymphoma was diagnosed post mortem. Miliary tuberculosis was also present.

Conclusions: Lymphoma can mimic disseminated tuberculosis in HIV positive children. Both pathologies may co-exist and diagnosing one does not preclude the other.

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Title: **MAKING PRACTICE VISIBLE – WHAT WE DO AND WHAT WE THINK WE DO IN PAEDIATRIC CARE SETTINGS**

Authors: Minette Coetzee, Candice Bonaconsa, Tania de Villiers, Weez Bramwell

Department: Child Nurse Practice Development Initiative, UCT School of Child and Adolescent Health

In most clinical practice environments there is still a large gap between what we think we do, what we do and what we know we should do. Evidence tells us that practice improvement hinges on two factors: firstly, the willingness to look at current practice and secondly to track and measure subsequent interventions and outcomes. Knowing what to do is one thing, actually doing it, correctly and consistently, is another.

Constraints are numerous and we know them well – staff shortages, long calls; equipment- the list goes on. The resource constraints are real and patients' disease profiles are complicated and recovery delayed by pre-existing poor health status. Pressures to 'work smart' and contain costs in the midst of this seldom allows the space to examine current practice.

At the Red Cross Children's Hospital in Cape Town, we have begun to tackle the challenge of scrutinising clinical practice to find ways of improving care. We have been using a participative action-based approach as the evidence indicates that the best practice in the hospital care setting depends on a well functioning and engaged multidisciplinary team.

This oral presentation will describe some of the methods used to gather data around current practice and how these translate to tackling specific aspects of day-to-day practice. It will describe the practical application of this practice-based research methodology in clinical settings.

Title: THE ROLE OF THE PEDIATRIC TERTIARY SERVICE IN WESTERN CAPE PROVINCE: THE RURAL PERSPECTIVE.

Authors: Breytenbach, W

At the end of 1996, the Southern Cape Karoo region appointed a full time paediatrician who expanded the service with daily outpatient clinics and regular outreaches to primary level hospitals.

The implementation of a good paediatric service in a rural area automatically results in an increase in the referral of complex and sick children to the specific level 2 hospital, George Hospital, in this particular setting. The paediatrician in the level 2 hospital does however, have limitations to his time, abilities and resources. For the system to function properly, it is important that the tertiary hospital must take over the more complex patients. By doing so they lower the work burden on the level 2 doctors, enabling them to do their job (to supply a second level service) properly. It also gives those children requiring tertiary care, access to a service where they have the undivided attention of a qualified sub-specialist, be it an intensivist, neurologist or cardiologist.

In the 12 months from July 1999 to June 2000 George Hospital transferred 32 patients to Red Cross Hospital comparing that with 105 patients transferred in the 12 months from July 2005 till June 2006. Another 93 patients were referred for Outpatient visits in the first 6 months of 2006. Excluded in these statistics are the referrals directly from hospitals like Oudtshoorn, Mosselbay, Knysna and Beaufort-Wes.

It is therefore paramount that while we as secondary level paediatricians have to continue on the path of improving the paediatric services in the rural areas with emphasis on preventative medicine, the tertiary services should not be neglected. In this regard we need the help of the tertiary level hospital and staff, as tertiary care still continues to be a main pillar in paediatric health care services.

Title: AUDIT OF ACUTE PERITONEAL DIALYSIS AT RED CROSS CHILDREN'S HOSPITAL (RXH) DURING 2005

Authors: Lalya F¹, Twahier H¹, Gajjar P², Nourse P⁴, Sinclair P², Scott C², Admani B¹, Argent A³ McCulloch M².

Department: ¹International Paediatric Nephrology Association (IPNA) Sponsored Fellows. Department of Paediatric Nephrology² and Intensive Care³, School of Child and Adolescent Health, University of Cape Town. Department of Paediatric Nephrology⁴, University of Stellenbosch.

Introduction:

Many children in acute renal failure or with critical metabolic conditions require renal replacement therapy (RRT). Acute peritoneal dialysis (APD) is one option of this RRT, that can be used in emergency situations to treat problems such as hyperkalaemia, diuretic resistant fluid overload, refractory acidosis, severe uraemia, requirement to create space for improvement of nutrition, removal of drug or toxin, and hyperpyrexia/hypothermia

Aim:

The aim of this study is to assess conditions in which APD is performed by the Red Cross Children's Hospital (RCCH) paediatric nephrology team, and to evaluate the outcome.

Methods:

Retrospective observational study of all children aged 0-15 years admitted to RCCH or associated neonatal units with conditions necessitating RRT and who received APD during 2005.

Results:

A total of 43 patients received APD during 2005. Patients were 26.9 months on average (3days-15years). The mean weight was 9.26kg (900g-30kg). Gender ratio female: male. 1.3:1. The majority were seen in ICU (88%).

The main underlying diagnosis was cardiac disease (37.2%), infection/sepsis (20.9%). gastroenteritis (9.3%), haemolytic uraemic syndrome (4.7%) and others (32.6%).

Dialysis indications were mainly oliguria/anuria (53.5%); hyperkalaemia (44.2%), uncontrolled acidosis (27.9%) and fluid overload (20.9%).

The type of catheter used was "Cook" of different sizes (65.1%), "Kimal" (27.9%); surgical "Tenckhoff" was used in 7% of cases. The dialysis modality was manual (55.8%) or cycling using Home Choice machine (44.2%).

The mean duration of APD was 4.3 days (1-23 days).

Children improved in most cases (survival rate: 68%); fourteen died.

Conclusion:

APD is a relatively easy procedure for acute dialysis which can be life saving for children. It is appropriate in the African setting, as it does not depend on expensive technology. Survival rate is comparable to our previous audits and also to continuous haemodialysis used in other paediatric units.

Title: A REVIEW OF PAEDIATRIC HAEMODIALYSIS (HD) PATIENTS AT THE RED CROSS CHILDREN'S HOSPITAL (RXH).

Authors: Sinclair G, Meredith S, Du Plessis M, Gajjar P, Nourse P, McCulloch M.

Department: School of Child and Adolescent Health, Red Cross Children's Hospital, University of Cape Town

Objectives: Over the past five years, both the acute and chronic haemodialysis patient loads at RXH have increased significantly. Reasons for this include increased capacity and experience of the renal team especially with smaller children coupled with the merger with both Tygerberg Hospital's Paediatric Renal and Cardiac services in 2003.

In most cases haemodialysis is a last resort, where peritoneal dialysis has failed, and is usually a bridge to transplantation.

Methods: Currently there are 2 volumetric single pump haemodialysis machines, with a reverse osmosis machine in a dedicated dialysis room.

We audited the data from 2002 – 2006 of all patients who underwent haemodialysis – both acute & chronic haemodialysis. Patient number, weight, age, diagnosis, ultrafiltration (UF) goal & catheter size were all extracted from the standard haemodialysis chart.

Results:

	Acute	Chronic
2002	38	47
2003	140	12
2004	35	87
2005	37	110
2006	97	125
Totals	347	381

Demographics of children dialysed included age ranging from 1 – 18 years (mean 9.4yrs) and weights ranging from 10 – 80kg (mean 27.4kg). Gender consisted of 30 females and 26 males.

The majority of the patients (83.9%) required acute dialysis (i.e. less than 18 sessions) with the remainder requiring longer term dialysis.

The success of the HD programme can be measured by the number of successful transplants performed on 44/56 patients that required HD during the 5 years. This represents a transplant rate of some 78.6%.

Conclusion: Despite Peritoneal Dialysis being our first line dialysis modality, haemodialysis (HD) is now available even to the smallest baby in our setting. Haemodialysis in children remains extremely challenging and requires a dedicated team of technicians, nurses and doctors who are capable of coping with complications in children. This is best based in a combined paediatric dedicated haemodialysis unit.

Title: COMBINED LIVER-KIDNEY TRANSPLANTATION: THE RED CROSS CHILDREN'S HOSPITAL EXPERIENCE

Authors: McCulloch M, Burger H, Spearman CWN, Gajjar P, Goddard E, Sinclair P, Wiggelinkhuizen J, Maythem D, Van Dugteren G, Savage L, Morrison C, Muller EA, Numanoglu A, Millar AJW, Rode H, Khan D.

Department: School of Child and Adolescent Health, Red Cross Children's Hospital, Cape Town.

Objectives: To document our experience of combined liver-kidney transplantation in paediatric patients.

Methods: A retrospective folder review of 5 patients, who underwent combined liver-kidney transplantation between January 1997– June 2006.

Results:

Indication for transplantation:

Primary Hyperoxaluria (n = 4)

Polycystic Kidney Disease with congenital hepatic fibrosis (n = 1).

Age at Diagnosis:

2.8 – 12.2 year (mean 6.8 yr)

Age at Transplant:

6.5 - 13.9 years (mean 11.7yr)

Weight at time of Transplant:

16.5 - 53 kg (mean 31.6kg)

Primary Hyperoxaluria:

- The diagnosis was confirmed by liver biopsy (1 patient) and stone analysis (3 patients)
- All the patients with primary hyperoxaluria required dialysis for 5 - 36 months (mean 20mths) before transplant
- Waiting time for transplantation varied from 4.7 - 36 months (mean 19.8mths)
- GFR at time of transplant ranged from 6 - 10ml/min/1.73m² (mean 7.8).
- Postoperative haemodialysis with hyperhydration (> 3 litres/m²/day) and maximal diuresis was required in 2 hyperoxaluria patients using gastrostomies.
- One patient developed recurrence of oxalate crystal deposits in her graft kidney due to poor compliance with fluid intake. Her current GFR is 32ml/min/1.73m² after 4 years.
- The remaining 3 patients have stable creatinine <110umol/l with calculated GFR of 60-104 ml/min/1.73m² (mean 77).
- Long-term liver function remained stable in all of these patients.
- One patient died 6 days post transplant due to hepatic artery thrombosis and primary non-function of the renal graft.

Outcome: With follow-up between 2.3 - 9.7 years (mean 5.1yr) we currently report patient and graft survival of 80% at 5 years.

Conclusions: Combined liver-kidney transplants have been successful in our program with close attention to prevention of recurrence of stones and preservation of the graft.

Long waiting lists result in increased morbidity and mortality pre- and post-transplant, due to oxalate crystal deposition resulting in end-organ damage.

Title: PRE-HEPATIC PORTAL HYPERTENSION
A RETROSPECTIVE REVIEW

Authors: Dr RJ De Lacy, Dr E Goddard, Prof JD Ireland

Department: Department of Gastroenterology, Red Cross War Memorial Children's Hospital,
Cape Town, South Africa

Objectives: To review the presentation, course and outcome of children referred to or presenting to Red Cross War Memorial Children's Hospital with pre-hepatic portal hypertension.

Methods: A retrospective folder review was done from June 2000 to June 2006.

Results: 15 patients were identified from the folder review with pre-hepatic portal hypertension. Of the 15 patients, 7 were female and 8 were male. Age at presentation ranged from 7 months to 7 years. Two patients were post-liver transplantation of which 1 was female and 1 male. Seven patients had more than 4 courses of sclerotherapy with the maximum being 14 courses. One patient developed a stricture secondary to sclerotherapy. Five patients went on to have a Meso-Rex shunt including the two liver transplant patients, 1 had a Warren shunt and 1 a spleno-renal shunt. One patient is currently being worked up for a Meso-Rex shunt. Of the 15 patients only 3 have never had haematemesis or malaena.

Conclusion: The above results although only a small sample does demonstrate that children with pre-hepatic portal hypertension can have life threatening bleeds requiring recurrent sclerotherapy and the complications associated with it. As we are a referral centre, our patients come from outlying areas and some are not close to health services. Children requiring recurrent sclerotherapy or those who have a life threatening bleed should be evaluated for a shunting procedure sooner rather than later.

Title: HEREDITARY PROTEINURIA SYNDROMES

Authors: MOTALA A.I¹, SINCLAIR-SMITH C¹, GAJJAR P², MCCULLOCH M²

Department: Departments of Anatomical and Paediatric Pathology
University of Cape Town and National Health Laboratory Service¹
Department of Paediatrics and Child Health, UCT²

Aim: An audit of hereditary proteinuria syndromes seen at the Red Cross Children's Hospital from 1957 - 2006.

Materials/Methods: A search was performed to identify cases of congenital nephrotic syndrome and hereditary glomerular disorders. Histological, immunofluorescence and ultrastructural features were reviewed. Cases were classified into subcategories: Congenital Nephrotic syndrome - Finnish Type, Diffuse Mesangial Sclerosis (isolated or with Denys-Drash Syndrome) and Hereditary glomerular disorders including Alport's syndrome and Thin Basement membrane disease.

Results: Twenty-one cases were identified. This included 9 cases of Alports syndrome(42.9%), 2 cases of Thin basement membrane syndrome(9.5%) and 10 cases of congenital nephrotic syndrome(47.6%). The latter comprised 2 cases of Denys-Drash syndrome, 3 cases of Finnish-type Congenital Nephrotic syndrome and 5 cases of congenital nephrotic syndrome of Non-Finnish type (diffuse mesangial sclerosis). 72 cases of nephrotic syndrome were biopsied during a four-year period including two cases of congenital nephrotic syndrome(2.7%).

Conclusions: Congenital nephrotic syndrome is a heterogenous disorder comprising a significant proportion of cases of hereditary proteinuria and biopsied nephrotic syndrome.

Title: DIAGNOSTIC AND THERAPEUTIC INTERVENTIONS IN THE MANAGEMENT OF TAKAYASU'S ARTERITIS AT RED CROSS CHILDREN'S HOSPITAL

Authors: McCulloch M, Gajjar P, Beningfield S, Wieselthaler N, Andronikou S, Shipton S, Lawrenson J, Kahn D, Millar AJW, Numanoglu A.

Department: School of Child and Adolescent Health, Red Cross Children's Hospital, Groote Schuur Hospital and Tygerberg Hospitals, Cape Town

Introduction: Takayasu's Arteritis in children is a chronic, idiopathic, inflammatory disease affecting the aorta and its main branches. Newer diagnostic modalities combined with aggressive therapeutic measures have in recent years resulted in improved outcomes.

Aim: Review of angiographic findings as well as radiologic and surgical therapeutic interventions in our patients with Takayasu's Arteritis.

Method: Retrospective analysis of Takayasu's Arteritis patients managed aggressively by percutaneous transluminal-angioplasty of aorta and affected vessels, nephrectomies and autotransplantation or revascularisation of renal vessels.

Results: 48 patients in total with Takayasu's Arteritis from 1978-2006 reviewed. 41 of the 48(85%) of the patients underwent angiography with renal involvement and aortic undulation in 65%. Tuberculosis has been postulated as a trigger with Mantoux positivity in 45/48(94%) of our cases. Percutaneous transluminal-angioplasty (PTA) to control hypertension was performed.

Percutaneous Transluminal Angioplasty (PTA) (12 patients)	14 cases
Aortic dilatations	4/4 successful
Renal Vessel dilatation	6/10 successful

1 Case had a covered self-expanding stent inserted into thoracic aorta. In recent years, CT and MR Angiography have been increasingly used with excellent resolution, enabling us to plan surgery from the modalities. 26 patients underwent surgery for hypertension; 14 nephrectomies, 2 gortex graft insertions and 11 patients with re-vascularisation/autotransplantation of 16 kidneys.

	Left kidney	Right kidney
Auto-transplant (5 patients)	4 (2 failed)	2 (1 failed)
Re-vascularisation (6 patients)	5 Splenic artery used in all	5 1 middle colic 1 right internal iliac 3 saphenous vein graft to hepatic artery (1 failed)

All cases undergoing surgery resulted in resolution of cardiac failure and much improved hypertension. Overall survival in last 10 years improved to 83% with a more interventional approach.

Conclusions: It has proved easier in the short term to control hypertension and alleviate symptoms in the patients managed with aggressive therapy. A combined interventional radiological and surgical approach has significantly improved long-term outcome.

Title: AUDIT OF A PAEDIATRIC DAY WARD ATTACHED TO A MEDICAL SUB-SPECIALTY WARD

Authors: Black D, McCulloch M, Savage L, Burger H, Van Der Merwe M, Twahier H, Gajjar P.

Department: Department of Paediatric Nephrology, School of Child and Adolescent Health, Red Cross Children's Hospital.

Objectives: To audit the attendance of the paediatric day ward and assess its importance in the effective management of medical sub-specialty patients.

Methods: A retrospective folder review of patients attending the paediatric day ward, attached to ward E2 from 1 Jan 2006 to 30 June 2006. This is a sub speciality ward including Allergy, GIT & Liver, Metabolic, Neurology and Nephrology & Transplant patients.

Results: A total of 590 patients were reviewed of which 381(66%) Renal; Liver & Gastrointestinal 167(28%) and the remaining 42 patients (7%) Allergy and Neurology.

The busiest day was Monday accounting for 25% of the patient load with the busiest month being May (21%).

Sixty (10%) of the 590 attendances were private patients

The day ward was not used as an alternative to clinic visits as 11(3%) renal patients only, were seen in the day ward on clinic days of which 2 needed acute admission.

Overall, unnecessary admissions were avoided as a total of only 33 (14 %) patients were admitted from the day ward.

Complicated investigations were co-ordinated through the day ward, especially in "out of town" patients, preventing unnecessary admissions.

Treatments administered on the day ward included daily intravenous antibiotics, albumin, immunoglobulin and immunomodulating therapies.

This day ward functioned most effectively when a dedicated nurse and doctor were allocated to this area.

Conclusions: The addition of a day ward relieves the burden on "already full wards" at a time when in-patient beds are at a premium. It also allows co-ordinated investigations and improved monitoring of patients on an outpatient basis. A wide variety of multi-disciplinary conditions were seen in this area.

The day ward needs dedicated nursing and doctor support to run effectively.

Title: CHILD NURSE PRACTICE INITIATIVE
RED CROSS WAR MEMORIAL CHILDREN'S HOSPITAL
WARD C2

Authors: SPN R. APRIL; RPaedN E. BRAMWELL; Assoc. Prof. M. COETZEE; RPaedN. T. DE VILLIERS.

The Child Nurse Practice Initiative was established to provide a forum for nurses to explore and try to solve complex situations within their wards and units making use of proven, researched methods.

Hospital acquired infections remain a constant challenge with both a financial and human cost.

Ward C2, a very busy burns ward, decided to try to address this challenge. By improving hand hygiene practices, they attempted to reduce the infection rate by 50% in seven months.

Improved hand washing techniques were tracked and correlated with the infection rate within the seven months.

Other factors influencing hospital acquired infections e.g. airflow, microbial load, the wearing of jewellery etc. will be addressed.

Title: HOME VENTILATION: THE RED CROSS CHILDREN'S HOSPITAL EXPERIENCE

Authors: Jane Booth*, Carla Brown*, Louis Reynolds**

Department: Tracheostomy and Ventilation Home Care Programme, Red Cross Children's Hospital
*School of Child & Adolescent Health, University of Cape Town

Objective: To review the home care ventilation programme at the children's hospital.

Methods: Patient selection: all patients on programme. Data collection: combination of prospective data collection and retrospective chart review. Data analysis: non-parametric.

Results: Sixteen children, 11 boys and 6 girls, were admitted to the programme. The diagnostic categories included congenital alveolar hypoventilation (3), neuromuscular disorders (9), idiopathic congenital scoliosis (1), chronic pulmonary disease including alveolar proteinosis and bronchiolitis obliterans (4). Three have achondroplasia.

The primary pathophysiologic causes of respiratory failure are indicated in the table.

Depressed central respiratory drive	3
Respiratory muscle weakness	9
Chest wall deformities	1
Chronic pulmonary disease	4

All but 2 children were successfully discharged from hospital.

Four died. One died at home during a power failure after 9 years after discharge from hospital. There were no other complications of treatment. Three of their diseases.

Thirteen are still alive (9 boys and 4 girls), aged between 10 months and 21 years. Twelve live at home. Two are on continuous ventilatory support round the clock; the remaining 10 are on nocturnal ventilation. One patient has non-invasive ventilation.

The primary care givers are mothers, and in one case, a grandmother. Only one is assisted by professional nurses.

The programme is highly cost-effective. Patients have spent an average of more than 6 years at home rather than in hospital.

Conclusions: The home ventilation programme is well established. It is highly cost-effective and has resulted in an immeasurable improvement in quality of life for a group of children with complex disorders.

Title: THE NEUROCOGNITIVE PROFILE OF SOUTH AFRICAN PRESCHOOL CHILDREN WITH NEUROFIBROMATOSIS 1.

Authors: V.Ramanjam, CM Adnams, JM Wilmshurst

Department: Division of Neurosciences and Child Development
School of Child and Adolescent Health, University of Cape Town.

Objective: Neurocognitive deficits are reported as the most frequent complication in children with Neurofibromatosis 1(NF1), with poor attentional skills also described. 70% of school aged children attending our Neurofibromatosis clinic showed academic problems. This study aims to determine the neurocognitive profile of preschool aged children with NF1 in order to institute early intervention.

Method: This forms part of an ongoing study. 11 preschool children aged 1 year to 8 years with NF1 were matched with 11 unaffected children with similar demographic profiles. Participants were tested using the Griffith's Scales of Mental Development. Parents completed the Aberrant Behaviour Checklist-Community (ABC).

Results: 2 control children were excluded. Data from 20 children was analysed. (NF1=11; control=9). Mean age NF1 vs control was: 57, 9 months vs 56 months (SD 17.25 vs 6.36) There was no significant difference in maternal age, education, housing, employment, or socio-economic status between the 2 groups. There were significant subtest differences in Eye-Hand Co-Ordination: mean NF1 vs control: 80.3 vs 101.4 (SD 11.04 vs 20.43) $p < 0.017$; Performance: mean NF1 vs control: 92 vs 104.1 (SD 12.01 vs 10.3) $p < 0.027$; and General quotient: mean NF1 vs control: 90.7 vs 103.7 (SD 10.72 vs 12.92) $p < 0.028$. The ABC questionnaire showed children with NF1 demonstrated significantly higher irritability: mean NF1 vs control: 17 vs 5.1, $p < 0.02$; hyperactivity: mean NF1 vs control: 8.2 vs 9, $p < 0.008$; and inappropriate speech: mean NF1 vs control: 5.1 vs 1.86, $p < 0.01$.

Conclusion: These findings highlight general performance, specific visuospatial, executive function and behavioural deficits in young children with NF1, thus supporting the need for early intervention.

Title: SYDENHAM'S CHOREA: A NEW APPROACH TO AN OLD DISEASE

Authors: Kathleen Walker, Mike Mann, Anita Brink, John Lawrenson, Wendy Mathiessen, Jo M Wilmshurst.

Department: Departments of Paediatric Neurology, Cardiology and Nuclear Medicine, Red Cross Children's Hospital, School of Child and Adolescent Health, University of Cape Town, South Africa.

Objectives: Medical treatment of Sydenham's chorea (SC) remains symptomatic. Intravenous immunoglobulins (IVIG) may have a role. We compared the outcome of patients receiving standard protocol to patients receiving IVIG in addition.

Methods: Between 2002 and 2005 patients presenting with **moderate to severe** SC were randomised to either IVIG protocol or standard protocol (penicillin and low dose haloperidol). Outcome measures of clinical state and features of SC were taken by the investigator and a blinded observer at onset, one, three and six months. Spectroscopy studies were performed at onset and one month. Scans were reviewed with intervention group blinded. Specific features of basal ganglia hyper- or hypoperfusion were recorded along with other areas of the cortex.

Results: Ten children presented (6 M: 4 F) (median age 122 mths); IVIG protocol (n=5) (3M:2F) and standard protocol (n=5)(3M:2F). The spectroscopy studies (n=9) identified changes in the basal ganglia (BG) in all: hyperperfusion n=2, asymmetry n=2, hypoperfusion n=5. Eight patients had additional areas of altered perfusion. At the one month follow-up, one patient in the IVIG group had definite improvement in the BG and all had clear improvement in the rest of the cortex. Of the standard group studied (n=4) there was progression in abnormal perfusion in all patients. A trend towards improved clinical outcome in the IVIG group, within three months, was demonstrated

Conclusions: The indications for IVIG in a resource poor country are debatable, but in our small cohort a trend towards improved clinical outcome within three months was demonstrated. As the sample was small, statistics were not done but the study is ongoing and formal statistics will be analysed at the termination of the study. Repeat spectroscopy at three months rather than one month is recommended.

Title: CEREBRAL OXYGENATION MONITORING IN CHILDREN WITH BRAIN INJURY

Authors: Tony Figaji, Simon Sandler, Andrew Argent, Graham Fieggen

Department: Divisions of Paediatric Neurosurgery and Paediatric Critical Care, Red Cross Childrens Hospital, Institute for Child Health, University of Cape Town

The goal of management in children with brain injury is the avoidance of secondary insults. The ultimate aim in management protocols for every form of brain injury is constant oxygen delivery to cerebral tissue, regardless of the nature of the primary insult. However, traditional methods of monitoring have not permitted direct measurement of the adequacy of oxygen delivery to the brain, which has therefore been inferred from the results of blunt investigative tools such as peripheral oxygenation, clinical examination, intracranial pressure, blood pressure and radiological imaging. None of these allow immediate intervention to protect cerebral tissue. Recognising the irreversible cerebral injury occurs even after short periods of hypoxia and that the regional determinants governing cerebral blood flow and metabolism are generally not detected, the degree to which patients with brain injury suffer potentially avoidable or reversible insults despite our treatment, or sometimes because of it, can only be surmised.

Recently, high quality direct brain oxygenation tissue monitoring has become technically feasible. This technology has the potential for overcoming the pitfalls of global methods of monitoring such as jugular venous saturation and near-infrared spectroscopy with high sensitivity detection of oxygen tension in tissues most at risk. Although some promising data exists for adults, no studies have adequately addressed cerebral tissue oxygenation-based management in children. In this paper we present our preliminary results of direct brain oxygenation monitoring in children with traumatic and infective cerebral injury.

Title: THE ROLE OF S100B IN CHILDREN WITH DIFFUSE AXONAL INJURY FOLLOWING TRAUMA

Authors: Simon Sandler, Graham Fieggen, Stephan Van Vuuren, Madaleen Van Vuuren, Andrew Argent, Mark Richards, Tony Figaji

Department: Division of Neurosurgery Red Cross Hospital, UCT
Department of Chemical Pathology, NHLS Tygerberg Hospital
Department of Paediatrics and Child Health Red Cross Hospital, UCT

Patients with diffuse brain injury are seen commonly in our service due to the high incidence of motor vehicle accidents, as a result of the acceleration-deceleration force transmitted to the brain when a head injury is sustained. Often there is very little evidence of the degree of brain injury visible on the CT scan, which is often normal or only demonstrates small contusions or blood in the ventricles. Magnetic resonance imaging would better demonstrate the extent of the injury, but this is not feasible in our context. One of the clinical difficulties in managing these patients relates to the prediction of outcome, which affects management decisions – currently our decisions are guided by clinical and radiographic criteria. Some of these patients make a good recovery, while others remain severely neurologically disabled, or even deteriorate further. It is common that, by clinical and radiographic criteria alone, we are unable to correctly predict the outcome for an individual patient.

S100B is a marker of neuronal injury that has been used for outcome prediction in brain injury, mostly in minor head injuries. There are few studies that have looked at this in a paediatric environment. None of these have specifically investigated the role of S100B in the context of diffuse axonal injury only. It may have a role in supporting clinical and radiographic information for management decisions based on outcome prediction.

Thus the aim of this study is to provide clarity regarding the value of serum S100B as a predictor of outcome in children where clinical and radiographic findings are inadequate. Such a marker can be a very useful adjunct in the management of patients and resources in head injury as well as in counselling the parents and guardians of such a patient.

The study rationale will be further discussed at presentation.

Title: **DEDICATED PAEDIATRIC URODYNAMICS – THE FIRST 100 CASES**

Authors: J Lazarus, P Gajjar, J Raad, M McCulloch, H Rode

Department: Division of Paediatric Urology and Nephrology, Red Cross Children's Hospital, School of Child and Adolescent Health, University of Cape Town

Introduction

We describe the establishment of a dedicated and equipped paediatric urodynamics suite at Red Cross Children's Hospital and the clinical experience in the first year of the unit's existence. We assessed the impact on patient management following the urodynamic study.

Method

A retrospective review of our clinical experience from the urodynamic database with 133 patients from May 2005 till April 2006 was performed.

Results

Patient gender consisted of 61% male and 39% female. The mean age was 8 years (range 7months – 16 years). The indications for urodynamic testing included meningomyelocele 54%, posterior urethral valves 13%, tethered cord 10%, dysfunctional voiding 6% and other 17%. Management was altered in: decision to proceed to surgery 11 patients, decision to commence clean intermittent catheterisation (CIC) 6, need for timed voiding 11, commencement or increase of anticholinergic dose 17, decision to stop CIC or anticholinergics 4, need for intravesical anticholinergic administration 9.

Conclusions

Urodynamics impacts positively on the management of patients with complex urology and nephrology problems.

Title: TO COMPARE BACTERIAL CONTAMINATION OF TWO INFANTS FEEDING SYSTEMS

Authors: LV Marino¹, E Goddard.² A Whitelaw³

Department: Departments of Dietetics¹ and Gastroenterology², Red Cross Children's Hospital & School of Adolescence and Child Health. NHLS/ Department of Clinical Lab Sciences.³

Aim: The study aims to compare the microbial contamination of two delivery systems of infant formula either a ready to use infant formula or a powdered equivalent, to infants at Red Cross Children's Hospital.

Background: The study arose as part of a best practice nutrition model regarding the introduction of ready to hang infant feeds compared to powdered feeds. Whilst there is a significant body of international data on the microbial contamination of powdered infant feeds (PF) there is no local data to support the use of ready to hang infant feeds over the current powdered alternative. Internationally and locally there is grave concern regarding the safety and efficacy of mixing powdered infant formula within health organisations with respect to bacterial contamination and related enteric infections, especially in immunocompromised and sick infants.

Ready to hang formulas (RTU) may be stored at room temperature and do not require refrigeration unless opened and are regarded as the safest way in which to provide non-contaminated nutrients to patients as a result of their sterility. The problem arises with powdered feeds, which are unsterile and may contain pathogens in addition to the contamination of utensils and environments in which they are made. Once reconstituted, powdered feeds should be stored at temperatures which maintain microbial integrity of the product. However local hospital practice often results in powdered infant feeds being left in high ambient temperatures until they are consumed by the patient.

A significant association has been found between the extent of bacterial contamination of infant feeds and the presence of diarrhoea. The administration of contaminated feeds to patients may result in patients being colonized by opportunistic pathogens or endotoxins. In one study the presence of Enterobacteriaceae was found in one third of all positive cultures. Septicemias, enteral sepsis, diarrhoea in addition to abdominal distention have all been described.

A safe, cost effective alternative, which improves the quality assurance and control of the infant feeds administered is therefore sought e.g. the use of RTU over PF.

Methods: Five mls samples of powdered feed (PF [Pelargon]) were randomly selected from the milk kitchen on the morning of the study using aseptic techniques. The study did not interfere with the normal manufacturing process. Unopened bottles of a sterile ready to use feed (RTU [Infatrini]) were included in the study samples.

The PF and RTU were transported to the GSH Microbiology Laboratory. Aliquots (100ul) of each milk sample were inoculated onto 2% blood agar and McConkey agar and incubated for 48 hours at 37°C. The milk samples were incubated at 30 degrees for 12 hours, with the aim of mimicking a hot summers day and general ward practice. After this period 100ul aliquots were again cultured as described above

After incubation colonies were counted, and expressed as colony forming units (cfu) per milliliter of sample. A significant level of contamination was defined as any positive microbial culture on receipt in the laboratory or as contamination with 10^{2-3} cfu/ml after overnight incubation at 30°C.

Results:

- 45 samples of Pelargon were randomly sampled of which 50% were contaminated with $> 10^4$ CFU at 0 hours.
- Of these samples bacterial growth was inhibited in ½ but accelerated in the remaining ½ of the sample.
- At 12 hours 15% had a CFU of $> 10^4$
- Organisms cultured included, Acinetobacter spp, Bacillus spp and coagulase negative staphylococci.
- RTU feeds showed no growth at 0 or 12 hours and remained sterile throughout the study period.

Conclusion:

At 0 hours the PF was significantly contaminated with potentially pathogenic organisms. Interestingly, overnight incubation of the milk at 30° appeared to reduce the degree of bacterial contamination in some samples while it increased in other samples.

The RTU showed no growth at either times and remained a sterile product.

Title: AN AUDIT OF THE MANAGEMENT OF SEVERELY MALNOURISHED CHILDREN AT RED CROSS CHILDREN'S HOSPITAL

Authors: Petersen R, Gwavu N, Marino LV, Goddard E, Hendricks M, Van Wyk G, Anderson A, VanZyl C, Lippiat-Moll T

Department: Child Health Unit, School of Adolescent and Child health

Objectives

The objectives of this study were to undertake an audit of severely malnourished children seen at Red Cross Children's Hospital over a one year period to assess if WHO 10 steps for management of severe malnutrition were adhered to.

Methods

Eligible patients were enrolled by four dietitians and data collection was completed by two registrars during the hospital admission. Statistical analysis was done using Microsoft Excel and EPI INFO version 6.

Results

93 patients were included in our audit, of whom 58% were HIV positive. Of the 32% tested for hypoglycaemia on admission, 10% were hypoglycaemic but only 66% were treated according to WHO recommendations. 45% of patients were dehydrated, with 25% mild and 16% moderate to severe but in total 55% of patients received intravenous fluids. Supplementation of micronutrient deficiencies was insufficient with only 61% receiving zinc, 24% trace elements, 34% vitamin A and 52% folic acid. 16% received iron supplements inappropriately on day 1. Investigation and treatment of infections were done according to WHO guidelines. Nutritional requirements were met in the initial phase with 95% of patients reviewed by a dietitian in the wards. The mean weight gain was below the recommended. 8.5g/kg/day. The mortality rate was 19% of whom only 38% were HIV positive.

Conclusions

WHO management guidelines for malnutrition were not fully adhered to during our audit. The mortality rate is higher than currently recommended. Training of staff with regards to WHO management guidelines and greater implementation in wards are essential for improved outcomes of severely malnourished children at Red Cross Children's Hospital.

Title: AN AUDIT OF THE MANAGEMENT OF RHEUMATIC HEART DISEASE AT THE PIETERSBURG PROVINCIAL HOSPITAL

Authors: Mr MA Roussot (5th year medical student, University of Cape Town);
Dr CJ Sutton FCPaed(CMSA), Polokwane/Mankweng Hospital Complex, University of Limpopo

Department: University of Cape Town and University of Limpopo

Objective: In response to concerns about inadequate follow up, this study is intended to evaluate the adherence to follow up of children with rheumatic heart disease (RHD) at the Polokwane Paediatric Cardiac Clinic (PPCC).

Methods: A retrospective review of the medical records for the 112 children diagnosed with RHD at the PPCC from 2002 to 2004 was conducted. Data that was extracted from the medical records included patient identification details, medical and diagnostic details, and management and follow up details. The study group was divided into subgroups according to the management strategy for analysis.

Results: 102 children were included in the study group, 61.8% of whom were female. The distribution of age at diagnosis peaked in the 10-11 years age group. Ascertained prevalence rates for the Limpopo were lower than expected and showed marked disparity between the districts. Mitral incompetence constituted the majority of the cardiac involvement (58.8%). The overall dropout rate was 44.1%; the majority of the dropouts occurred after the first visit. The children receiving penicillin prophylaxis and antifailure therapy had the highest dropout rate (59.6%) and the children having received cardiac surgery had the lowest drop out rate (18.1%).

Conclusions: The study was able to identify that there may be considerable under-diagnosis and under-referral of RHD in the Limpopo and that a substantial proportion of children with RHD seen at the PPCC are being lost to follow up. The need for improvement in the management of children with RHD especially with the use of a patient held record and an effective recall system has been identified.

Title: EARLY VENTILATORY PREDICTORS FOR PRETERM INFANTS AT RISK FOR BRONCHOPULMONARY DYSPLASIA: THE THRESHOLD FOR EARLY TREATMENT.

Authors: E Burger*, J Smith*, C H Pieper#

Department: *Neonatal Division, Tygerberg Children’s Hospital, Stellenbosch University, #* Neonatal Services, Groote Schuur Hospital, University of Cape Town

Introduction:

Bronchopulmonary dysplasia (BPD) is a serious long-term complication of very-low-birth weight neonates who require ventilation for severe respiratory distress syndrome. Multi-factorial risk factors for BPD include gestational age and birth weight, the severity of RDS, chorioamnionitis, symptomatic patent ductus arteriosus and sepsis. Possible early predictors of BPD published showed ventilator peak inspiratory pressures and ventilation rate on day 28 of life were the best predictors of outcome. Lower a/A ratios on postnatal day 2, 3, 4, 7, 14, **21 and 28 were** found in non-survivors.

Objective of this study:

The aim of this study was to assess possible early ventilator-associated predictors of BPD to identify babies at risk.

Methods:

A retrospective study using babies that required ventilation for RDS, were <1500g and/or<32 weeks gestation and who survived to 28 days was done. BPD was defined as oxygen dependency beyond 28 days of life or 36 weeks post menstrual age with corresponding x-ray evidence.

Results

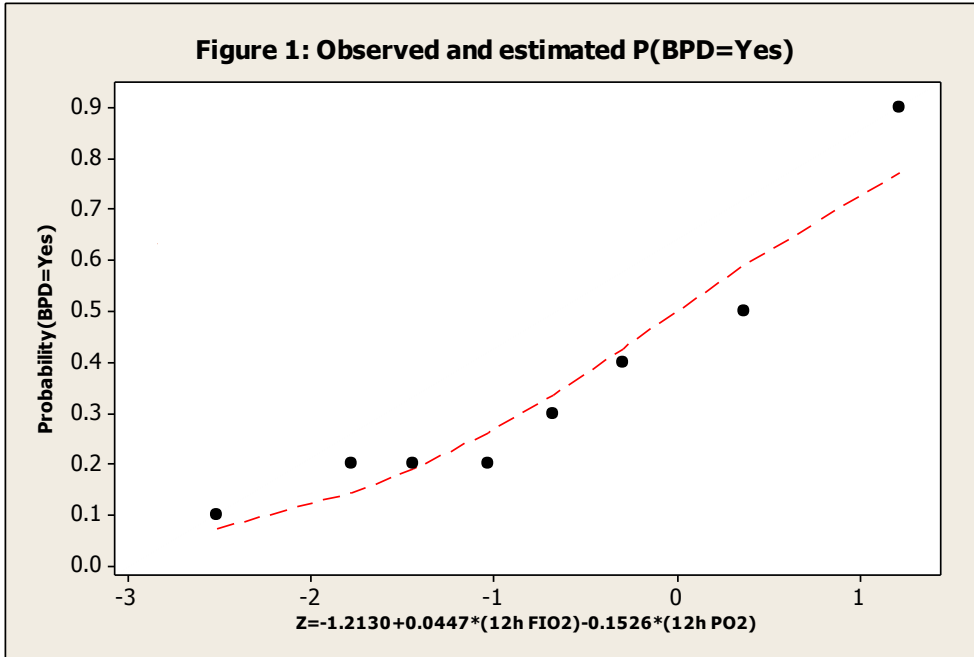
85 babies were enrolled. Their data as follows:

Table 1: Important parameters in predicting BPD

	Parameters	All patients (n=85)		BPD (n=29)		Non-BPD (n=56)		p
		Mean	SD	Mean	SD	Mean	SD	
General	Birth weight (g)	1189	175.5	1144.31	188.50	1213.75	166.28	0.025
a/A ratio	12 hr	0.4	1.3	0.25	0.18	0.45	0.38	0.0034
	24 hr	0.41	0.23	0.30	0.23	0.47	0.22	0.001
	D3	0.39	0.23	0.27	0.16	0.46	0.24	0.001
FiO2	12 hr	45.2	23.6	58.33	26.69	38.51	18.76	0.0009
	24 hr	36.9	19.1	48.35	20.66	31.32	15.67	0.003
	D3	38.7	21.0	51.59	22.42	32.33	17.29	0.003
pH	12 hr	7.39	0.12	7.37	0.13	7.41	0.11	0.0001
	24 hr	7.36	0.07	7.32	0.07	7.37	0.07	0.0006
PaCO ₂ (kPa)	12 hr	4.4	1.7	4.86	1.36	4.23	1.90	0.0004
	24 hr	4.66	1.0	5.07	1.09	4.47	1.02	0.00001

The best equation using the most selective predictors:

Figure 1: Observed and estimated P(BPD=Yes)



Cut-off Z is taken at $\log_e(0.393/(1-0.393))$

	Fitted		
	No	Yes	Total
Observed No	41	11	52
Observed Yes	11	17	28
Total	52	28	80

Sensitivity = 0.780
Specificity = 0.607

Discussion:

This study found significant differences between the two groups with the infant who develops BPD having a distinct “profile” during the first 3 days of life. This difference includes low birth weight and an intermediate type of ventilator support with high oxygen requirements for moderate RDS at the ‘cost’ of normal arterial blood gases. Using the abovementioned equation it is possible to predict who will develop BPD in 78% of cases. These findings could assist in decision-making with regard to early interventions such as postnatal steroid treatment in at risk infants.

Title: AN ALTERNATIVE TREATMENT OF ULNAR POLYDACTYLY

Authors: Dr M.Maree; Dr S. Carter

Department: Congenital Hand Unit
Red Cross Hospital
Department of Orthopaedics
University of Cape Town

Introduction:

Rudimentary ulna polydactyly is one of the most common hand anomalies. These are conventionally treated in the post-natal period by suture ligation, or formally excised under general anaesthesia at one year of age. Treatment modalities not without a significant complication rate. We propose an alternative method, using vascular clip ligation as an outpatient procedure, and compare the cost and results to that of conventional treatment.

Methods:

We reviewed 53 patients over an eleven-month period. Their average age was five months. There were 28 males and 25 females. There were a total of 80 digits, of which 27 were bilateral. A liga clip was applied at initial presentation, to the base of the digit, under local anaesthesia, as an outpatient procedure.

Results:

At one-week follow-up, the stump had necrosed leaving no residual nubbin. No clips had fallen off prematurely. At three-month follow-up, no complications were noted.

On comparison to surgical excision, there was an eight-fold difference in total cost, including theatre time, staff and patient costs.

Conclusion:

Liga clip ligation of extra digits is a better alternative to conventional treatment. It is more cost-effective, potential complications of anaesthesia and surgery are avoided, as well as knot slippage, residual nubbin, venous engorgement and sepsis of the stump, complications common with suture ligation.

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Title: FOREARM LENGTHENING IN CHILDREN

Authors: E B Hoffman
S Dix-Peek

Lengthening of the ulna or radius is controversial. Paley (1990) and Peterson (1994) advocate aggressive treatment of the deformity for cosmetic and functional reasons. Schoenecker (1997) has shown that mature patients are comfortable with their appearance and functional deficit.

We reviewed 8 forearm lengthening performed in 8 children in the 14 year period from 1991 to 2004. The average age at surgery was 10,6 years (range 6 to 14 years). Five patients had ulnar shortening (osteochondroma = 4; posttraumatic growth arrest =1). Of the three patients with radial shortening, one was a congenital short radius and two had growth arrest (post trauma and meningococcal septicaemia). The shortening resulted in a cosmetically unacceptable ulnar or radial tilt with absent radial or ulnar deviation of the wrist. Four patients had decreased supination and/or pronation of the forearm. One patient with a proximal ulnar osteochondroma had a dislocation of the radial head with cubitus varus.

Excision of the osteochondroma was done 6 months prior to the lengthening. Lengthening was accomplished with two Ilizarov rings with a distal corticotomy for radial shortening, or a proximal corticotomy for ulnar shortening. Reduction of the dislocated radial head was achieved with an olive wire. Associated procedures were: hemiephiseal stapling of the distal radius for an increased radial articular angle in three patients with osteochondroma, and a corrective osteotomy of the distal radius in two patient with posttraumatic growth arrest. The average lengthening obtained was 24mm (range 15 to 45 mm) with an average lengthening index of 1.2 months per cm.

At an average follow-up of 5 years (range 2 to 14 years; 7 patients to maturity) all patients were satisfied with the cosmetic improvement and had full radial and ulnar deviation. Only one of the four patients recovered full supination and/or pronation. We concluded that forearm lengthening is warranted for cosmetic and functional reasons.

Title: IDIOPATHIC PERONEAL SPASTIC FLAT FOOT: CHILDREN AND ADOLESCENTS

Authors: Dr P Ehlers
Dr N Wieselthaler
Dr S Dix-Peek
Prof E B Hoffman

Tarsal coalition has been well recognized as the commonest cause of peroneal spastic flat feet in children and adolescents (Mosier and Asher 1984). Other rare causes are tuberculosis and rheumatoid arthritis. If no aetiology can be found the term idiopathic peroneal spastic flat foot has been coined by Schoenecker (2000).

We prospectively assessed 15 children (21 feet) with peroneal spastic flat feet seen at our clinic in the period 2001 to 2004. The average age was 13 years (range 10 to 15 years). Screening for tuberculosis (ESR, Mantoux and chest radiograph) was negative in all patients. Rheumatoid factor was positive in one patient with juvenile idiopathic arthritis (JIA).

Radiology was standardized. Plain radiographs were standing lateral and 45 degree oblique views. CT and MRI: (i) axial: parallel to plantar surface; (ii) coronal oblique: gantry perpendicular to the plane of the subtalar joint.

Four patients (7 feet) had a calcaneonavicular coalition on the 45 degree oblique plain radiographs. This was also shown on the axial CT and MRI views. No talocalcaneal coalition was visualized on the coronal oblique CT and MRI views.

In order to find a diagnosis and confirm the accuracy of the MRI and CT, the middle facet of the talocalcaneal joint was explored in eight feet and a synovial biopsy done. No talocalcaneal coalition was found. JIA was histologically confirmed in one patient.

Idiopathic flat foot is the commonest cause (12/21=57%) of peroneal spastic flat foot in our practice. Calcaneonavicular coalition occurred in 7/21 (33%) of feet and JIA in 2/21 (10%).

The 45 degree oblique plain radiograph is as accurate as CT and MRI to show a calcaneonavicular coalition, and CT and MRI angled coronal views are equally accurate to exclude this coalition.

Title: RANDOMISED CONTROLLED TRIAL OF THE EFFICACY OF A METERED DOSE INHALER WITH BOTTLE SPACER FOR BRONCHODILATOR THERAPY IN INFANTS AND YOUNG CHILDREN WITH ACUTE LOWER AIRWAYS OBSTRUCTION

Authors: HJ Zar, S Streun, M Levin, EG Weinberg, G Swingler

Department: School of Child and Adolescent Health, Red Cross Children's Hospital, University of Cape Town, Cape Town, South Africa

Background: Inhaled bronchodilator therapy given via a metered dose inhaler (MDI) and spacer is optimal for relief of bronchoconstriction. Conventional spacers are expensive or unavailable in developing countries but there is little information on the efficacy of low cost spacers in young children.

Objective: To compare the response to bronchodilator therapy given via a conventional or low cost bottle spacer in infants and young children

Methods: A randomised controlled trial of the efficacy of a conventional compared with a bottle spacer for bronchodilator therapy in young children with acute lower airways obstruction. Bronchodilator therapy was given from a MDI via an Aerochamber or a bottle spacer. A clinical score and oximetry recording were done prior and 15 minutes after therapy. MDI-spacer therapy was repeated up to 3 times, dependent on clinical response, after which nebulisation was used. The primary outcome was hospitalization.

Results: Four hundred children, aged [median (25th-75th percentile)] 12 (6-25) months, were enrolled. The number hospitalized (60, 15%) was identical in the conventional and bottle spacer groups (30, 15% in each). Secondary outcomes including change in clinical score [-2 (-3 to -1)], oxygen saturation [0 (-1 to 1)] and number of bronchodilator treatments [2 (1 to 3)] were similar in both groups. Oral corticosteroids, prescribed for 78 (19.5%) children, were given to a similar number in the conventional [37 (18.5%)] and bottle spacer groups [41 (20.5%)].

Conclusion: A low cost bottle spacer is as effective as a conventional spacer for bronchodilator therapy in young children with acute lower airways obstruction.

Funding: World Health Organisation, ALLSA GSK research award

Title: ISSUES IN THE DEFINITION OF CLINICAL END-POINTS IN CLINICAL TRIALS OF NEW VACCINES FOR THE PREVENTION OF TUBERCULOSIS

Authors: Tony Hawkrigde; Mark Hatherill, Lesley Workman, Larry Geiter*; Greg Hussey

Department: South African Tuberculosis Vaccine Initiative, Institute of Infectious Disease and Molecular Medicine, University of Cape Town; * Aeras Global Tuberculosis Vaccine Foundation, Maryland, USA

Background:

In the absence of a robust immune correlate of protection against tuberculosis, trials of vaccines against tuberculosis have to rely on clinical endpoints. However, the diagnosis of tuberculosis in infants and young children, the most likely target age group for novel priming tuberculosis vaccines, is difficult, subjective and frequently imprecise. Heavy emphasis is placed on the detection of hilar adenopathy on chest radiographs and the interpretation of clinical signs and symptoms which are known to be non-specific and poorly predictive.

Methods

11680 newborns were vaccinated in a clinical trial comparing the efficacy of Bacille Calmette Guerin (BCG) given by the percutaneous or the intradermal route in the prevention of tuberculosis in the first two years of life. A combination of active and passive follow up identified **1902** of these as being either tuberculosis contacts or having signs or symptoms of tuberculosis or both and these were evaluated for tuberculosis infection and disease in a dedicated case verification ward. Diagnostic verification included a detailed history and physical examination, tuberculin skin testing, culture of induced sputum and gastric lavage specimens for *Mycobacterium Tuberculosis*, chest radiography and serological testing for HIV.

Results

1701 (16.3%) infants and young children were evaluated during **1902** admissions for TB. **195** (10.3%) had gastric washings and or induced sputa which were culture positive for *M. tuberculosis*, **995** (52.3%) had chest radiographs compatible with PTB and **785** (41.2%) obtained a score of ≥ 7 on a widely used clinical scoring system. Of the **195** culture positive cases, **70** (35.9%) had no radiological and little clinical support for TB, **54** (27.7%) had radiological but little clinical support, **26** (13.3%) had no radiological but some clinical support and **45** (23.1%) had both radiological and clinical support for the diagnosis.

Discussion

The presentation discusses the implications of the above for the choice of endpoints of TB vaccine trials as well as for routine clinical care of infants and children suspected of having TB.

Title: A REVIEW OF THE GENITAL DISORDERS CLINIC AT RED CROSS CHILDREN'S HOSPITAL

Authors: A. Spitaels

There are few recent reports of disorders of sex development (DSD) in Africa. Studies have examined series of patients with a particular condition, such as gonadal dysgenesis or 5 α reductase deficiency, in a defined population group. Previous reports have noted the relatively high incidence of ovotesticular DSD in Southern Africa.

Aim: Review the local experience with disorders of sex development.

Method: Folder review 1980 - 2006.

Results:

- 216 records reviewed
- 30% 46XX
 - 43% Congenital adrenal hyperplasia, 53% 46XX ovotesticular DSD, 4% 46XX testicular DSD
- 40% 46XY
 - 55% Hypospadias without specific diagnosis, 17% androgen insensitivity syndromes, 3% gonadal dysgenesis, 11% undescended testes, 4% micropenis, 8% other
- 28% karyotype not documented
- 2% other
 - 3 patients mosaicism, 1 47XXY
- 38% did not keep last recorded appointment
- 7% of children have biopsy proven ovotesticular DSD
 - 44% of the children studied are Black South Africans
 - 39% 46XX – of whom 35% proven ovotesticular DSD
 - 15.6% of all Black South Africans ovotesticular DSD
 - Children with confirmed histology ($n=16$)
 - 81% of all children have 46XX karyotype
 - 87% of Black South African children have 46XX karyotype

Discussion:

A relatively high incidence of ovotesticular DSD is once again noted, as is the high percentage of these children with 46XX karyotype. The service has a limited capability for the diagnosis of undervirilized boys. We are not able to comment on long-term outcome.

Title: THE PREVALENCE OF ADRENAL SUPPRESSION IN SCHOOL AGE CHILDREN AT THE ALLERGY UNIT OF RED CROSS CHILDREN'S HOSPITAL: A PILOT STUDY

Authors: Ekkehard W Zoellner, MMed(Paed)MBBCh DCH¹, Carl J Lombard, PhD², Ushma Galal, BSc Hon² and Eugene Weinberg, FCP(SA)³.

Department: ¹Paediatric Endocrinology, Red Cross Children's Hospital, University of Cape Town, Rondebosch, Cape Town, Western Cape, South Africa; ²Biostatistics, Medical Research Council, Tygerberg, Cape Town, Western Cape, South Africa and ³Allergy, Red Cross Children's Hospital, University of Cape Town, Rondebosch, Cape Town, Western Cape, South Africa.

Body: Background: Hypothalamic pituitary adrenal axis suppression (HPAS) when treating asthmatic children with inhaled corticosteroids (ICS) or nasal steroids (NS) is thought to be rare.

Objectives: To determine the frequency of HPAS in asthmatic children treated with ICS & NS in the allergy unit of Red Cross Children's Hospital.

Methods: 26 asthmatic children, 5-18 years old, on ICS, not treated with oral or topical steroids in the last year were recruited. Clinical features compatible with HPAS were documented. Daily and cumulative steroid dose, compliance, symptom control and lung functions were recorded. The 1-day metyrapone test was performed and HPAS prevalence estimated using 100 pg/ml post-metyrapone cut-off. Spearman correlations coefficients (r) were calculated between the post-metyrapone ACTH and each variable.

Results: Prevalence of HPAS = 35(17-56) % (8/9 on NS). Of these, height velocity was < 25th percentile in 5/9, weight velocity < -2 SDS in 1/9, orthostatic hypotension in 1/9, symptoms in 1/9.

Asthma Control	
Variable	r
Compliance	-0.20
Night-time symptoms	-0.09
Day-time symptoms	-0.26
FEV ₁ %	-0.27

Exposure	
Variables	r
Daily ICS dose	0
Daily ICS dose/m ²	-0.12
Cumulative ICS dose/m ²	-0.26
Daily NS dose	-0.35
Daily NS dose/m ²	-0.42*
Cumulative NS dose/m ²	-0.42*

* p < 0.05

19/26 were on budesonide (BUD) Hfa MDI, 7/26 on BUD CFC MDI, 23/26 used spacers, 22/26 on NS, 20/26 on nasal beclomethasone.

Conclusions: Every third asthmatic child on ICS & NS may have HPAS. Clinical signs are unhelpful. Level of asthma control is not predictive. Cumulative dose, body size & NS may contribute to HPAS.

Title: IMMUNITY TO MYCOBACTERIA IN HEALTH CARE WORKERS

Authors: David Beatty, Mary-Ann Davies, Mark Nicol, David Pienaar, Sedicka Samodien, Beate Kampmann

Department: School of Child and Adolescent Health, Red Cross Children's Hospital, University of Cape Town

Objective: To examine the relationship between contact with tuberculosis (TB) patients in health care workers (HCWs) and development of significant immune responses to TB; To correlate immune responses to TB with the ability to restrict mycobacterial growth *in vitro*.

Methods: HCWs working in TB wards and clinics were recruited and immune responses to TB assessed using the enzyme linked immunospot (ELISPOT) assay. This detects interferon gamma (IFN- γ) secretion in response to stimulation by PPD and *Mycobacterium tuberculosis* (MTb) specific antigens. Control of mycobacterial growth in healthy ELISPOT-positive and ELISPOT-negative HCWs was compared using a whole-blood killing assay that employs recombinant luminescent mycobacteria (BCG-*lux*).

Results: Positive IFN- γ responses to PPD were found in 45/47(96%) HCWs while 33/47 (70%) had positive responses to TB-specific antigens (ESAT-6 and/or CFP-10). Positive responses to TB-specific antigens were less common in those working less closely with TB patients (OR=0.26 [95%CI:0.07 – 0.99]; p=0.049), but were not related to duration of exposure. In a subset of patients (n=26) in whom the BCG-*lux* assay was performed, positive ELISPOT responses to TB-specific antigens were associated with a significantly enhanced ability to restrict growth of mycobacteria *in vitro* (p=0.006).

Conclusion: Positive IFN- γ responses to TB-specific antigens are found in a large proportion of healthy HCWs and are related to level of exposure. These responses are associated with enhanced ability to restrict growth of TB organisms *in vitro*.

Title: CYTOKINE PROFILE OF T CELLS AFTER NEWBORN BCG VACCINATION

Authors: ¹Andreia Soares, ¹Sarah Joseph, ²Holden Maecker, ³Gilla Kaplan and ¹Willem Hanekom

Department: ¹South African TB Vaccine Initiative, University of Cape Town, South Africa; ²BD Biosciences, San Jose, California; ³Public Health Research Institute, Newark, NJ.

Bacillus Calmette-Guerin (BCG), the only currently available TB vaccine, is the most widely administered vaccine in the WHO Extended Programme on Immunization. However, the immune response to BCG has not been fully characterized. This knowledge is critical for studies of protective immunity induced by vaccination and for developing novel, improved TB vaccines.

Objective: We aimed to describe cytokine-production by T cell subsets in the peripheral blood of 10-week old infants (n=30) following their routine vaccination with BCG at birth.

Method: Infant whole blood was incubated with BCG for 12 hrs; Brefeldin A was added for the last 5 hrs. Red cells were lysed and white cells fixed and cryopreserved. Thawed cells were permeabilized and stained to determine CD3, CD4, CD8, IL-2, TNF, IFN- γ , IL-10 and IL-4 expression in a single 10-parameter flow cytometry panel.

Results: We observed predominant expression of presumed protective Type 1 cytokines. IFN- γ was most frequently detected and correlated with total Type 1 CD4+ and CD8+ T cell responses. CD4+ T cells expressed Type 1 cytokines at higher frequencies than CD8+ cells (median 0.32% and 0.20%, resp.). Importantly, 7 distinct Type 1 CD4+ T-cell subsets were identified, based on IL-2, TNF or IFN- γ expression; also in CD8+ T cells, which expressed lower TNF. Expression of the presumed non-protective Type 2 cytokine IL-4, and of the regulatory cytokine IL-10, was detectable but low, and never in Type 1 cytokine expressing cells.

Conclusion: We conclude that newborn BCG vaccination induces predominantly Type 1 cytokine responses in CD4+ and CD8+ T cells. Importantly, significant numbers of specific T-cells did not produce IFN- γ , suggesting that assays relying on detection of this cytokine alone do not measure the entire mycobacteria-induced response. We will now apply this knowledge to a large ongoing study of BCG-induced immune correlates of protection against TB in children.

Title: COMPARISON OF BODY SURFACE AREA-BASED DOSING AND A WEIGHT-BASED DOSING METHOD FOR LOPINAVIR/RITONAVIR IN A DEVELOPING COUNTRY

Authors: J. Nuttall, M. Zampoli, B. Eley, M-A. Davies

Department: School of Child and Adolescent Health and Red Cross Children's Hospital, University of Cape Town, South Africa

Objective: In South Africa, the antiretroviral drug lopinavir/ritonavir (Kaletra®) is used in the first-line treatment regimen recommended for human immunodeficiency virus (HIV)-infected children between 6 months and 3 years. Although dose recommendations are based on body surface area (BSA), the national treatment guidelines incorporate a weight-based dosing chart derived from standardised US growth charts but designed for use in resource-limited settings. It is not known how accurately this method reflects BSA-based doses in a developing country context with high rates of malnutrition and advanced HIV disease.

Methods: We calculated the difference between weight-based and BSA-based doses for Kaletra® solution and capsules using actual heights and weights from HIV-infected children taken at the time of initiating antiretroviral therapy at our hospital. All children older than 6 months of age with body weight of 7 kg or greater who started treatment between August 1998 and July 2006 on whom anthropometric data was recorded were included.

Results: There were 454 children (56% males) who matched inclusion criteria. Median age (IQR) was 43 months (22-76). Forty-three percent of children were severely underweight (weight-for-age Z-score <-3) and/or severely stunted (height-for-age Z-score <-3). The weight band dose was significantly greater than BSA-based dose with a median percentage difference (IQR) of 25 (17.6-33.3) and 33.3 (12.3-51.5) for solution and capsules respectively ($p < 0.001$). Weight band dosing would have resulted in an equivalent dose greater than 300 mg/m² in 34% and 52% of children for solution and capsules respectively.

Conclusions: In this group of children, dosing of lopinavir/ritonavir according to the weight band chart in the South African national treatment guidelines results in significantly higher doses than recommended BSA-based doses. Further studies are needed to assess safety and efficacy using the weight band dosing method for lopinavir/ritonavir in resource limited settings.

Title: PAEDIATRIC ANTIRETROVIRAL THERAPY (ART) AT COMMUNITY-BASED PRIMARY HEALTH CARE LEVEL IN SOUTH AFRICA: EARLY OUTCOMES AND CHALLENGES.

Authors: Zampoli M, Davies MA, Apolles P, Finlayson H, Eley B, Hendricks M

Department: Red Cross Children's Hospital, Cape Town
School of Child and Adolescent Health, University of Cape Town

Setting: Accredited public service ARV "roll-out" primary health care clinic in Cape Town.

Design: Prospective one year observational study.

Methods: Children commenced on ART between January 2004 and May 2005 clinically evaluated at monthly intervals were monitored as follows: CD4 count and viral load (VL) at baseline, month 6 and 12; full blood count and alanine transaminase: baseline, month 1, 3, 6 and 12; random cholesterol and triglycerides at month 12. Attendance of clinic appointments and significant (≥ 3 consecutive doses) ARV (any drug) treatment interruptions (TI) were documented at each visit.

Results: Twenty eight children with median age 31 months (IQR 14-48) were started on antiretroviral therapy. The mean baseline CD4% and VL log was 13.8% (SD 5.96) and 5.39 copies/ml (SD 0.72) respectively. Most children (75%) were moderately symptomatic (WHO stage 2) and few (7%) were severely (WHO stage 3) symptomatic. Moderate and severe malnutrition (Z score < -2) was present in 9 (32.1%) who were underweight and 13 (46.4%) with stunting. No mortality occurred and of 24 (85.7%) children remaining in care after 12 months: 19 (79%) had an undetectable (< 400 copies/ml) viral load; mean CD4% increased significantly to 28.3% ($p=0.000$); and all nutritional parameters (Z-scores) showed significant ($p < 0.003$) improvement. Three (grade 3 or 4) adverse events occurred but all were asymptomatic and resolved spontaneously. A 1.18 log (95%CI: 0.25 - 2.11) greater reduction ($p = 0.015$) in VL was observed with 100% appointment attendance as compared to those with poorer attendance.

Conclusion: Antiretroviral therapy in children is effective and safe at primary care level in South Africa. Limited laboratory safety monitoring should be considered in this setting but needs further evaluation. Housing insecurity, maternal illness and substance abuse are important factors disrupting ART in children.

Title: THE NUTRITIONAL STATUS OF CHILDREN WITH AND WITHOUT HIV INFECTION ADMITTED TO THE BROOKLYN HOSPITAL FOR CHEST DISEASES

Authors: K Cilliers*, M Willemse*, MS Willemse*, D Labadarios**, GD Hussey***, HS Schaaf*, PR Donald*

Department: *Dept. of Paediatrics and Child Health,** Dept. Human Nutrition, University of Stellenbosch,***School of Child and Adolescent Health, University of Cape Town.

Objective: Evaluation of the nutritional status of children with tuberculosis, with and without HIV infection, (HIV-negative & HIV-positive) at Brooklyn Hospital for Chest Diseases. The evaluation was by anthropometry and determination of selected nutrients.

Methods: The children were enrolled prospectively when tuberculosis was diagnosed and a decision taken to admit the child to BHCD. The children were evaluated within 2 months of, and again, at 4 months after treatment commencement.

Results: Sixty children, median age 38 months, (36 HIV-negative) were enrolled. 15 (44%) HIV-negative children had a weight for age of >3rd percentile and 7 (27%) HIV-positive. Kwashiorkor was present in 11 (32%) and 11 (46%) of HIV-negative and HIV-positive children. On admission muscle mass, measured by arm muscle area, was more depleted in both groups than fat mass. Subscapular skinfold was normal in 88.2% of HIV-negative children and 62.5% HIV-positive children, triceps skinfold (TSF) was normal in 59% of HIV-negative and 45.8% HIV-positive children. Fat distribution appears disproportionate in both groups. TSF and mid-upper-arm circumference for height decreased in the HIV-positive group, showing a decrease in fat stores, but increased in the HIV-negative group.

Low serum vitamin A concentrations (<20 µg/ml) were found in 30% and 33% of HIV-negative and HIV-positive children on admission, but 16% and 48% after 4-months. Low serum pyridoxine values (<6 ng/l) were found in 18% and 52% of HIV-negative and HIV-positive children on admission and 6% and 43% after 4-months. At 4-months persistently low albumin values (<35 g/dl) in 76% HIV-positive children and CRP values of >10mg/dl in 57% compared to 75% and 63% respectively on admission were found.

Conclusion: Both groups had a high incidence of malnutrition of various forms; persisting abnormalities in HIV-positive children may indicate ongoing inflammatory activity, despite TB treatment. Pyridoxine supplementation should be considered for children treated for tuberculosis.

Title: THE ROLE OF CAPFSA IN THE NEW FIREARM BILL IMPLEMENTATION

Authors: Pumla Nyakaza, Nelmarie du Toit, , Sebastian van As, Heinz Rode

Department: Child Accident Prevention Foundation of Southern Africa and Trauma Unit, University of Cape Town, Department of Paediatric Surgery, Institute of Child Health, Red Cross War Memorial Children's Hospital, Cape Town, South Africa

Introduction In South Africa in 2000, we were faced with a significant increase in firearm related injuries in children in the preceding decade. One of the most obvious significant causes was the free availability of guns. The usual argument was that guns were needed for self-defence, and that stricter firearm laws would not decrease firearm abuse. We reviewed our experience with gunshots in children and used our review to influence politicians to accept a child-friendly and completely New Firearm Bill.

Objective To provide an overview of gunshots treated at Red Cross Hospital and use these data to influence policy makers.

Methods Two-hundred-and-seventy-eight (278) records of patients treated for gunshots at the Red Cross Trauma Unit were analysed and these data were presented for an Parliamentary Committee in September 2000. This academic presentation, topped up with emotive pictures of young firearm victims, was instrumental in winning the parliamentary committee to vote in favour of the new and child-friendly fire-arm bill. The Bill was accepted with an overwhelming majority. (In spite of excessive lobbying by the Firearm Related Industry, Hunting Organizations and people claiming to need a gun for self-defence.)

Results There has been a sharp decrease in children treated at our institution with gunshots since the New Firearm Bill was accepted. The majority of children were accidentally hit by stray bullets and therefore these numbers represent a measure of the amount of shots fired in the communities.

Discussion Violent assaults occur frequently in our society. A large percentage of these crimes are performed with firearms. A substantial amount involves children, either indirect or direct. Gunshots are a prime cause of unnatural deaths in South Africa and responsible for over 50% of all homicides. Through adequate lobbying a significant reduction of fire-arm related injuries were treated after our campaign started in 2000. However, the recent surge of fire-arm related injuries requires urgent attention.

Conclusion The Child Accident Prevention Foundation has had a major impact on the successful implementation of the New Fire Arm Bill. Continuous lobbying for strengthening this New Bill remains however a priority.

Title: **LIMB GIRDLE MUSCULAR DYSTROPHIES: the contribution of Western blotting to diagnosis.**

Authors: Felicity Leisegang¹, Jo Wilmshurst³, Colleen Jackson² and Howard Henderson¹

Department: Divisions of Chem Pathology¹ and Anat Pathology², and Dept Paed Neurology³, UCT (GSH/RXH)

Introduction: Patients with limb girdle muscular dystrophy (LGMD) are part of a complex group of neuromuscular disorders with many phenotypic variations in presentation, outcome and course. Molecular diagnosis is difficult and currently relies mainly on immunohistochemical (IHC) staining of muscle biopsy sections.

Aim: This presentation will expand on the use of Western blotting of protein extracts from muscle biopsy sections as a contribution to the making of definitive diagnoses of neuromuscular disorders in children through the confirmation of protein deficiencies in muscle tissue.

Method: Protein extracts from 4-5 cryosections, West blot procedures are standard.

Results: The method has successfully detected Duchenne, Becker and Emery-Dreifuss muscular dystrophies, and has diagnosed a dysferlinopathy in two patients.

Conclusions: Western Blotting has significantly expanded diagnostic competence in this under recognised group of conditions and must contribute to the expansion of the current knowledge base. More definitive subtype information will increase the feasibility of performing linkage analysis in affected families. The linkage sites of most forms of LGMD, connective variants and congenital muscular dystrophies are now known, but molecular genetic assessments are impractical without muscle protein deficiency data. Studying diagnostically confirmed cases would increase the chance of gene localisation and mutation detection

Title: BCG INDUCED ANTIBODY RESPONSES IN INFANTS

Authors: Mark Bowmaker¹, Alexander Jernberg², Markus Maeurer², Willem Hanekom¹

Department: ¹ South African Tuberculosis Vaccine Initiative (SATVI), Institute of Infectious Diseases and Molecular Medicine (IIDMM), UCT. ² Institute for Microbiology Cancer and Cell Biology, Karolinska Institute, Stockholm Sweden.

Bacillus Calmette-Guerin (BCG) is the only current licensed vaccine against Tuberculosis (TB) and has been in use since 1921. BCG induced protection against disseminated TB in infants has been demonstrated, however, BCG does not offer high levels of protection against pulmonary TB as demonstrated by the rising global incidence of TB despite the widespread use of the vaccine.

BCG is thought to prime the immune system to mount a cell mediated immune response against mycobacterium tuberculosis (MTB). Most other vaccines in use in humans rely on eliciting protective antibody responses against pathogens. For many years the scientific dogma was that antibodies play a minor role in the host defence against MTB. However experiments showing protective effects of monoclonal antibodies to MTB proteins have led to the reviewing of role of antibodies in TB.

In order to study the antibody profile induced by BCG vaccination a peptide array of 63 selected MTB proteins was used to screen the BCG antibody response of five 10 week old infants vaccinated at birth. Serum antibodies to peptides of a range of mycobacterial proteins were detected. Antibodies to proteins present in MTB but absent in BCG such as ESAT-6 and CFP-10 were not detected, suggesting that the infants had not been exposed to MTB and that the antibodies measured were BCG specific. Cord blood samples were also analysed for reactivity to mycobacterial proteins. Cord blood showed lower reactivity to mycobacterial antigens than the 10 week post vaccination samples, indicating a vaccine induced antibody response. However, cord blood plasma showed antibody reactivity to some peptides suggestive of a possible maternal contribution to the response.

Title: FOOD ADDITIVE SENSITIVITY IN CHILDREN WITH CHRONIC URTICARIA

Authors: Naidoo S, Hawarden D, Potter PC, Motala C

Department: Allergy Clinic, Red Cross War Memorial Children's Hospital (RCWMCH)

Background

Chronic urticaria (CU) in children remains a challenge for investigation and its aetiology is largely unknown. Possible links exist between CU and intolerance to food additives. The reported incidence of additive-induced CU is extremely low. The diagnosis of intolerance to additives relies on double-blind-placebo-controlled oral challenge testing (DBPFCT), a procedure which is time consuming and largely confined to tertiary centres or research units(1). The Cellular Allergen Stimulation Test (CAST), an in-vitro test, is potentially useful for detecting sensitivity to food additives. The principle of CAST testing involves:

- * IL3 primed fresh basophils are exposed to various concentrations of the suspected allergen
- * Basophils that are sensitized to the allergen being tested release sulphido leukotrienes (sLT)
- * The leukotrienes are measured using an ELISA assay
- * Positive and negative cut offs for the various agents have been determined by using sera from healthy volunteers and patients with confirmed sensitivities)(2)

Table 1: Technical cut-off levels of sLT (pg/ml) for positive reactions to food additives (2)

Tartrazine	120
Sodium benzoate	90
Sodium nitrite	60
Potassium metabisulphite	40
Food colourant mix 1(Quinoline Yellow,Sunset Yellow FCF, Chromotrope B,Amaranth ,New Coccine	160
Food colourant mix 2(Erythrosine, Patent Blue V, Indigo carmine, Brilliant black)	100

Objective

To determine the prevalence of intolerance to food additives in children with CU referred to the Allergy Clinic, RCWMCH

Methods

The study was part of an extensive cross-sectional study to determine the prevalence of autoantibodies to the high affinity IgE receptor in children with CU (Published: Du Toit et al, Ann Allergy Asthma 2006,96: 341-344) One hundred children referred to the Red Cross Children's Hospital during a 3 year period for evaluation of CU were studied. Evaluation for sensitivity to food additives included: (1) completion of food diaries for at least a month and documenting episodes of urticaria (date, time, duration, medication used). (2) CASTs were performed for the following food additives: sodium benzoate, tartrazine, potassium metabisulphite, food colourant mix 1 and mix 2. If the CAST results were above the cut off values (Table 1), the test was regarded as positive and avoidance of the offending additive(s) was implemented (in collaboration with a professional dietician). Adherence to the avoidance diet was assessed via self reporting

Results

Ten patients (10% of the original cohort) had positive CASTs (Table 2); three patients were monosensitive with the remainder sensitive to more than one additive. The commonest causative agents, singly or in combination were tartrazine and benzoates, a finding noted by other investigators as well (1,4)

The elimination diets resulted in substantial improvement of symptoms (decreased frequency/severity of flares) in all patients. Medication (antihistamine) requirement also decreased: intermittent dosing or decreased dosage. None of our patients have showed complete resolution of their symptoms. Possible reasons for this: firstly, failure to adhere strictly to the avoidance diet; secondly, the role of food additives in CU is more likely to potentiate urticaria rather than being the primary cause in patients with idiopathic CU.

Table 2

Tartrazine	8
Sodium benzoate	8
Sodium nitrite	1
Potassium metabisulphite	1
Food colourant mix 1	2
Food colourant mix 2	1

Conclusion

Food additives may play a greater role in CU than suggested by previous studies. The CAST is a potentially useful test for detecting sensitivity to additives

Title: PAEDIATRIC URODYNAMICS : ESTABLISHMENT OF A UNIT IN A DEVELOPING COUNTRY.

Authors: P. Gajjar, J. Raad, J. Lazarus, L. Savage, M. McCulloch

Department: Paediatric Nephrology and Urology Units
Red Cross Children's Hospital, Cape Town, South Africa

Introduction: Bladder function is paramount to normal renal function. The study of Urodynamics is important in assessing bladder pressures, capacity, and voiding patterns. It is an integral part of a urological assessment, and is particularly useful in patients with neural tube defects. It is also an important assessment in potential kidney transplant (Tx) recipients where the bladder is implicated in the primary pathology.

A Paediatric Urodynamics Unit was established as an outpatient service at Red Cross Children's Hospital in May 2005. Prior to this, we utilized a service provided by an adult tertiary hospital. This was not child-friendly and yielded unsatisfactory results.

Aim: Review the establishment of a Paediatric Urodynamics service.

Method: Review development of programme, training initiatives undertaken, and provide an overview of the population of patients tested from May 2005 to April 2006.

Results: 1. Programme development, including equipment, staff training and record keeping
2. Training initiatives including,
Pre-establishment visit to Great Ormond St Children's Hospital.
Practical training at Buzzi Children's Hospital, in Milan
Attending lectures by Dr Wright, from Guy's Hospital, London
3. Patient review
No of patients: 94 patients
Age range 1yr to 17 yr; mean age 9,3yrs
Gender: Males 63, Females 31
Referral Source: Review of the various disciplines utilizing the Service

Diagnoses: The majority had Spinal defects with neurogenic bladders; Other diagnoses included ano-rectal malformations, posterior urethral valves and dysfunctional voiding.
Outcome: In 70% of the cases investigated, alternative management strategies were recommended in response to the Urodynamic findings

Conclusions: The establishment of a Paediatric Urodynamics service as a new service in a tertiary academic setting has been challenging. Despite this, a large series of patients investigated in the last 12 months, illustrates the need for such a service. The challenges, both related to staff and patients have been identified and can now be addressed.

Title: CLINICAL FEATURES AND RESPONSE TO TREATMENT OF HIV-INFECTED CHILDREN ENROLLED IN A STUDY OF 6-MONTHS VS 9-MONTHS TREATMENT FOR TUBERCULOSIS

Authors: J Kerner, S Adams, HS Schaaf, MF Cotton, GD Hussey¹, PR Donald

Department: Paediatrics and Child Health University of Stellenbosch and Tygerberg Children's Hospital School of Child and Adolescent Health, University of Cape Town (1)

Objective: This is a descriptive study of the clinical features, certain special investigations and response to treatment in HIV-infected children enrolled in one arm of a multicentre study of 6-months vs 9-months of treatment for tuberculosis.

Methods: Children were prospectively screened for enrollment and randomly assigned to either 6-months or 9-months of standard antituberculosis treatment. All enrolled patients have now been followed up for at least 18-months.

Results: 238 children were screened and 50 (mean age 24 months) enrolled (27 females) and 27 randomized to 6-months and 23 to 9-months treatment. 2 children left the study (1 negative HIV-PCR and 1 because a MOTT was cultured). A culture of *M tuberculosis* was obtained from 17/48 children (35%). INH resistance was found in 1 child and MDR in another child. 33 (66%) children had a negative Mantoux test. 26 (52%) children had a known household tuberculosis contact, 14 of which was the mother/father and a further 10 another close relative. 7 (15%) children (mean age 10 months) died, and 7 were lost to follow-up. Of 32 children followed up for at least 18 months, 2 have been started on TB treatment again, 1 on the basis of clinical features (treated for 6-months) and 1 was re-infected (confirmed by RFLP fingerprinting) with a MDR organism. 22 children have been started on HAART.

Conclusion: The results of this study were confounded by the introduction of HAART. The relapse rate in this arm of the study is well within that of adult studies of tuberculosis treatment in immunocompetent individuals. The mortality is in keeping with that of other studies of HIV associated tuberculosis in children. It is noteworthy that despite poor nutritional condition, no child experienced hepatotoxicity, either with or without HAART, neither was immune reconstitution syndrome observed in any children after commencing HAART.

Title: REGULATORY CD4+ T CELLS INDUCED BY NEWBORN VACCINATION WITH BCG

Authors: Joanne Riley¹, Anthony Hawkrige¹, Gregory Hussey¹, Gilla Kaplan², Willem Hanekom¹

Department: ¹South African Tuberculosis Vaccine Initiative, Institute of Infectious Disease and Molecular Medicine, University of Cape Town, Cape Town, South Africa.; ²Public Health Research Institute, Newark, New Jersey.

Objective: Regulatory T cells (Tregs) are critical for control of protective immune responses to foreign organisms. Our objective was to determine whether BCG vaccination of the newborn induces specific Tregs and to characterize these Tregs by associated markers and cytokines. We hypothesize that a dynamic equilibrium exists between specific regulatory and conventional immunity.

Methods: We incubated whole blood from 15 10-week old infants, vaccinated with BCG at birth, with BCG. Brefeldin A was added after 7 hours; red cells were lysed and white cells fixed and cryopreserved after 12 hours. Cells were later thawed, permeabilized and stained. We used flow cytometry to measure the BCG-induced CD4+ T cell expression of Foxp3, IL-10, TGF- β , CTLA-4, CD25 and Th1 cytokines (IL-2, TNF- α and IFN- γ).

Results: BCG increased expression of Foxp3, a regulatory T cell-specific marker, in CD4+ cells by a median 23%, in comparison to unstimulated whole blood. Further, distinct subsets of potential Tregs were found: (1) Foxp3+ cells, mostly expressing CD25 and CTLA-4 also, but with negligible IL-10, TGF- β and Th1 cytokine (IFN- γ , IL-2 and TNF) co-expression, a population which probably includes naturally-occurring Tregs, (2) IL-10-producing Tr1 cells, which did not co-express Foxp3, TGF- β or Th1 cytokines, and (3) TGF- β -producing Th3 cells, which did not co-express Foxp3, IL-10 or Th1 cytokines.

Conclusions: Our results suggest that BCG induces 3 distinct CD4+ regulatory T cell subsets in addition to conventional Th1 cells: (1) Cells that are Foxp3+ but do not produce cytokines such as Th1 cytokines, IL-10 or TGF- β , (2) IL-10 producing cells that do not express Foxp3 and (3) TGF- β producing cells that do not express Foxp3. The regulation of the immune response to BCG will involve a complicated dynamic of various T cell subsets not necessarily quantified by a single marker such as Foxp3 expression.

Title: **EQUIPMENT AND STRESS – TRACKING THE CORRELATION**

Authors: Megan Abbot; Tania de Villiers; Minette Coetzee

This project was part of the Child Nurse Practice Development Initiative at the Red Cross Children's Hospital. The aim was to track and improve the management and maintenance of equipment by 70% in 7 months by improving how equipment is tracked, used and managed.

In E2 fully functioning equipment such as scales, blood pressure monitors and dialysis machines are critically important. E2 is a busy sub-speciality ward with nephrology as the main speciality. Children who require complex procedures like haemodialysis and peritoneal dialysis along with those waiting for or post-transplant are nursed in E2.

The reason why we are doing this is that there is evidence which correlates the availability of reliable functional equipment to how people feel about their work. This is measured as staff engagement which is linked to increased work efficiency and increased quality of care.

In order to meet this aim, we tracked equipment on a weekly basis to assess and improve available equipment and staff competence in the use of equipment. We also measured staff perceived stress. by

This poster presentation will relate the data around broken equipment to perceived staff stress.

Title: **IMPROVING QUALITY OF PATIENT CARE BY IMPLEMENTING ACCURATE RECORD KEEPING PRACTICES – THE EXPERIENCE OF A PRACTICE DEVELOPMENT INITIATIVE IN WARD E1**

Authors: Gertrude Ramplin, Gretchen Allies, Tania de Villiers, Minette Coetzee

Department: Child Nurse Practice Development Initiative – School of Child and Adolescent Health

The Child Nurse Practice Development Initiative was established to create a forum where the complex issues surrounding the practical nursing care of children can be explored by nurses of various units in Red Cross Children's Hospital. The projects purpose was to enable nurse teams to consider their current practice and to identify something that they could tackle using a participatory action research process.

Ward E1 is a busy ward that provides specialized care to pre- and post- cardiac surgery patients, as well as patients requiring tracheostomy care. The core of quality patient care required in a ward such as E1 is the presence and practice of nurses (Benner, 2002). What nurses write can be the only evidence of nursing practice in the clinical setting.

The aim of this project was to improve patient documentation to 95% in 7 months by implementing and tracking accurate recordkeeping practices. An auditing tool was designed to help measure and track the process. The process of tracking was encouraged by having weekly gatherings and reflection around current recordkeeping practices in the ward.

This poster presentation will describe the practice improvement process in ward E1.

Title: IMPROVING QUALITY OF PATIENT CARE BY IMPROVING COMMUNICATION BETWEEN NURSES AND DOCTORS – THE EXPERIENCE OF A PRACTICE DEVELOPMENT INITIATIVE IN WARD S11

Authors: Charnette Elliot, Anneline Arendse, Nosiphiwe Marapula, Tania de Villiers, Minette Coetzee

Department: Child Nurse Practice Development Initiative – School of Child and Adolescent Health

The aim of this project was to improve doctor/ nurse communication in a busy short stay ward. The Child Nurse Practice Development Initiative was established to create a forum where the complex issues surrounding the practical nursing care of children can be explored by nurses of various units in Red Cross Children's Hospital. The projects purpose was to enable nurse teams to consider their current practice and to identify something that they could tackle using a participative action research process.

Ward S11 is a very busy, short stay medical ward with a high patient as well as doctor turnover. The high patient and doctor turnover requires good communication between doctors and nurses in order for care to be effected according to doctor's prescriptions. Evidence indicates that good relationships leads to increased staff engagement, decreased illness and absenteeism, increased confidence and increased ability to manage stress. Once presented with the existing evidence base for best practice, this team aimed to increase communication between nurses and doctors by 50% in 4 months by creating a central space where doctor's prescriptions could be accessed and treatment regimes implemented promptly.

This poster presentation will describe the practice improvement process in ward S11.

Title: STAFFING FOR HIGH DEPENDENCY CARE

Authors: Margie Weakly; Tania de Villiers and Minette Coetzee

This project aims to track the nature of patients who require high care in Ward B1 and correlate this to nursing staffing requirements.

B1 is a 27 bedded paediatric ward with staff allocation for 5 high dependency care beds. In recent years the acuity has risen significantly and along with that changing staffing requirements. The latter is however difficult to justify in the absence of reliable data.

Assessing high dependency care requires tools that differ from the extensively validated tools like PRISM (Paediatric Risk of Mortality) PIM and PIM II (Paediatric Index of Mortality II) NTISS: Neonatal Therapeutic Intervention Scoring System CRIB and CRIB II (Clinical Risk Index for Babies). The tool used at Red Cross Children's Hospital is a compilation of data including aspects of severity; number of organ systems that require support, age, and nursing activity scores (NAS). Staffing norms are set using various norms, but may be less responsive to changes in the patient profile. The literature indicates that the number of critical incidents (a quality of care indicator) is related less to the number of nurses than the level of qualified nurses on a ward.

This poster will describe the nature and acuity of children and relate this with the nursing staffing in B1.

Title: **PATIENT FLOW IN THE RED CROSS CHILDRENS' HOSPITAL OUT- PATIENT DEPARTMENT**

Authors: Jenny Urry; Delia Lodewyk; Weez Bramwell, Tania de Villiers, Minette Coetzee

Affiliation: Child Nurse Practice Development Initiative – School of Child and Adolescent Health

Objective: How are patient flow in an outpatients department related to communication between departments?

The Child Nurse Practice Development Initiative was established to create a forum where the complex issues surrounding the practical nursing care of children can be explored by nurses of various units in the Red Cross Children's Hospital. The projects purpose was to enable nurse teams to consider their current practice and to identify something that they could tackle using a participative action research process.

The Red Cross Hospital's Out Patients Department is very busy and it has many specialities which adds to the complexity of the flow of patients through the department. Flow is clearly related to communication between clinics and wards. Regular meetings enable nurses to track the process. A Pilot Study was conducted to assess a sample of patient's transit through the clinics.

Optimal care can only be delivered when the right patient is in the right place with the right provider and the right information at the right time. Healthcare Improvement (IHI): 2003. By improving access to accurate details of the different clinics, the team aimed to improve efficacy of bookings and so decrease delays and the waiting time.

This poster presentation will demonstrate the process used to gain baseline information on transit times to initiate change to improve communication and service delivery.

Title: **NURSING MORALE IS RELATED TO PROVIDING BEST CARE TO SICK CHILDREN – THE EXPERIENCE OF A PRACTICE DEVELOPMENT INITIATIVE IN WARD D2**

Authors: Yolanda Hendricks, Susan Williams, N. Lindi; Tania de Villiers, Minette Coetzee

Department: Child Nurse Practice Development Initiative – School of Child and Adolescent Health

The Child Nurse Practice Development Initiative was established to create a forum where the complex issues surrounding the practical nursing care of children can be explored by nurses of various units in Red Cross Children's Hospital. Ward D2 is a busy General Surgical Ward with a high patient turnover. The patient turnover is as a result of the ward's high number of theatre cases per month. The ward provides individual as well as specialised paediatric post surgical care. Evidence indicates that although many factors influence quality outcomes -- including staffing patterns, overtime hours, patient acuity, and use of agency staff -- the engagement level of the nursing professionals has a significant and profound impact. Studies have found that hospitals with *higher* nurse engagement have statistically *lower* mortality index and complication index.

Once presented with the existing evidence base for best practice, this team aimed to increase the perception of staff support by 50% in 7 months by creating intentional social spaces and encouragement opportunities and changing ward routines and rhythms. Staff engagement was measured initially and twice again since the inception of the project.

This poster presentation will describe the practice improvement process in ward D2, correlating interventions with staff engagement.

Title: PEANUT ALLERGY (PA) AND PEANUT SENSITISATION (PS) IN XHOSA HIGH SCHOOL CHILDREN AND THE ABILITY OF PEANUT-SPECIFIC IgG4 TO DIFFERENTIATE PA FROM PS.

Authors: *Du Toit G,*¹ *Levin M,*² *Motala C,*² *Turcanu V,*¹ *Stephens AC,*¹ *Roberts G,*³ *Lack G,*¹

Department: ¹ Kings College London, The Evelina Children's Hospital, Guy's & St Thomas's NHS Foundation Trust, London, UK
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Objective. We previously demonstrated, for a group of eczematous children in the UK, that peanut-specific IgG4 determination may have a role in distinguishing between PS and PA children. We therefore aim to determine the prevalence of peanut sensitivity and peanut allergy, and the possible role of peanut-specific IgG4 in differentiating these groups, in teenage Xhosa children.

Methods. A validated food allergy questionnaire was distributed to Xhosa-speaking high school pupils in Cape Town. Clinical evaluation included history, examination and metacholine lung-function tests. Immunological assessments included skin-prick testing and peanut-specific IgE and IgG4 (Pharmacia Immuno CAP-RAST). Patients were considered PA if they had a positive specific IgE and / or skin test to peanut and *reacted to peanut* (by questionnaire), and PS if specific IgE and / or skin-test positive and *tolerant to peanut*.

Results. Demographic & atopy: 151 Xhosa children were assessed (median age 17 years, 86 male, 65 female). Total IgE values: mean 279 kU/L (range < 0.3-330 kU/L). Five of the 151 (3.3%) had doctor-diagnosed asthma and 14 (9.3%) reported asthma symptoms (based on ISAAC questionnaire); 26/151 (17.2%) of the children were positive by metacholine challenge; 54/151 (35%) of children were sensitised to one or more of the following aeroallergens: Der P1, Der F, grass pollen mix, Bermuda grass pollen, mould, cat, dog and cockroach: 10 children were sensitised to 1 allergens, and 1 to all 6 aero-allergens tested. Four children had doctor-diagnosed rhino-conjunctivitis and 3 had doctor-diagnosed eczema (8 had self-diagnosed eczema). 47/151 (31%) of children are IgE sensitised to *Ascaris lumbricoides*, mean 0.64 kU/L. There is a trend towards higher IgE values in PS children. (Mann-Whitney $p=0.09$)

Food Allergy: 9/151 (6%) of children were SPT positive to one or more of the following food allergens: hens' egg white, cows' milk, peanut, potato and fresh potato: 5 children were mono-sensitised, 2 were to 2 allergens, and 2 were sensitised (to the single peanut allergen tested); in total therefore, 13/151 (9%) of children were food-allergen sensitised. No children were PA (using stringent validated diagnostic questionnaire criteria); hence, prevalence of PA 0% (95% confidence interval 0.0-24%). 7 Children were PS (2 SPT positive, 5 IgE positive, 1 both IgE and SPT positive). Median (and mean) **Peanut-specific IgE** was 0 kU/L (range 0-5.8kU/L). 2 SPT positive children returned wheal diameters of 4 and 5 mm. 75.4% (114/151) of all children and had a negative peanut-specific IgG4 (range 0-1783 ug/ml), median **specific peanut-IgG4** was 286 (mean 0 ug/ml). There is no significant difference in peanut-specific IgG4 between PS and non-PS children (Mann Whitney tests $p=0.197$). Mean and median **specific-IgG4/total IgE ratios**, for all children were 42.5 and 0, respectively. Comparing specific-IgG4 / specific IgE ratios for PS and non-PS children is not possible because of the number of children with zero results for peanut-specific IgG4 and IgE. The questionnaire identified 1 child with cow's milk protein allergy and 2 with egg allergy.

Conclusions. We observe a low prevalence of PA in Xhosa teenagers; however, the low number of study participants results in a wide 95% CI and restricts the confident extrapolation of these findings to a community prevalence. There are significant rates of asthma and sensitisation to both food and aeroallergens. Peanut-specific IgG4 determination is not helpful in distinguishing between children who are PS and non-PS. Analysis of IgG4 in PA children could not be made as none of the teenagers were PA. More studies are needed to determine those immunological factors which result in a sensitised but non-allergic phenotype.

Title: A COHORT STUDY OF HIV NEGATIVE ADOLESCENTS AGED 14 TO 17 YEARS IN PREPARATION FOR HIV VACCINE TRIALS

Authors: ^{a,b,c}Heather B Jaspan, ^eLandon Myer, ^dAlan J Flisher, ^{e,f}Cathy Mathews, ^aNosiphiwo Soka, ^aPrudence Mthimunye, ^aDumweni Joni, ^aDaniella Mark, ^aKeren Middelkoop and ^aLinda-Gail Bekker.

Department: ^aDesmond Tutu HIV Centre, Institute of Infectious Diseases and Molecular Medicine, University of Cape Town
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^eInfectious Diseases Epidemiology Unit, School of Public Health and Family Medicine, University of Cape Town Faculty of Health Sciences
^fHealth Systems Research Unit, Medical Research Council South Africa

Objectives: To assess feasibility of recruiting HIV-negative 14-17 year olds and measuring syphilis prevalence, HIV risk, and HIV knowledge, in a community where HIV vaccine trials are planned.

Methods: The study is being conducted in a peri-urban Xhosa-speaking community near Cape Town. Adolescents aged 14-17 were recruited through outreach activities and VCT centres. After informed consent was obtained, HIV and syphilis testing was performed, and pregnancy testing where applicable. 100 HIV negative, non-pregnant adolescents were enrolled and completed questionnaires around demographics, HIV knowledge, risk behaviours and perceived risk for HIV.

Results: Challenges arose in obtaining consent from parents, and required after hours home visits. Three adolescents screened out due to HIV infection, and three due to pregnancy. Of the 100 adolescents enrolled, 91 were recruited through outreach activities. The mean age of the participants was 15 years and 70% were female. Almost half (43%) reported they had ever had sex, 13 of which reported more than one sexual partner in the past 12 months. The participants all denied transactional and casual sex partners. A large proportion of the sexually active participants did not know the HIV status of their partners (81%), and many reported never using condoms (23%). Despite this reported behaviour, 13% of participants perceived themselves to be at risk for HIV, whereas 75% agreed contracting HIV would have negative consequences on their futures. Basic HIV knowledge was high. In a multivariate model adjusting for perceived HIV risk, HIV knowledge, and perceived impact of HIV, perceived risk of HIV was associated with sexual activity (OR 6.69; 95% CI 1.61-27.74).

Conclusions: Volunteers appear to be at high risk, yet do not recognise their risk despite being knowledgeable about HIV. The enrolment of high-risk adolescents into HIV vaccine trials will be feasible with flexibility in clinic hours and appropriate risk-reduction counselling.

Title: HYPOSPADIAS SURGERY AT RED CROSS CHILDREN'S HOSPITAL: 10 YEARS, 600 CASES

Authors: J Lazarus, L Jee, H Rode

Department: Division of Paediatric Urology, Red Cross Children's Hospital, University of Cape Town

Aim

To review the experience with hypospadias surgery at Red Cross Children's Hospital.

Method

The operative database of the cases performed by one surgeon (LJ) was reviewed for demographic data, type of surgery and complications for the 10 year period 1994 to 2004.

Results

631 operations were performed. Complete data was available in 618 patients. The mean age was 43 months (4years), with a median age of 34 months (2 ½ years) and a mode of 11 months.

Operations used were MAGPI 12%, Matthieu 19%, Snodgrass 3%, Onlay island flap 18%, Duckett repair 26%, staged repair 6%, Megameatus intact prepuce 4%, Chordee only 13%.

Surgery was complicated by urethrocutaneous fistula in 14%. 145 operations were done for fistula in 90 patients. Other revisions occurred in 37 patients (0.06%)

Conclusion

These data provide insight into the local experience with this complex surgery.

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Title: VIRTUAL PAEDIATRIC URORADIOLOGY LIBRARY

Authors: J Lazarus, H Rode

Department: Division of Paediatric Urology, Red Cross Children's Hospital, University of Cape Town

Introduction

We describe the establishment of an online library of uroradiological resources.

Method

Following the establishment of a Department of Paediatric Surgery website with student and patient resources at <http://www.paedsurg.uct.ac.za> we began to digitize the department's uroradiology collection.

Results

The virtual library has provided an imaging catalog of local examples of normal, abnormal and diseased anatomy. It has served as an educational tool for students and registrars via online presentation of clinical cases with questions. It is also hoped to function as a forum for knowledge exchange with other institutions.

Conclusions

Online resources offer a greater ease of access to information which can assist in education and collaborative academic endeavors.

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Title: REVIEW OF HUMAN IMMUNODEFICIENCY VIRUS (HIV) ASSOCIATED PAEDIATRIC RENAL DISEASE IN SOUTH AFRICA

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Introduction: HIV disease is a significant problem in South Africa with HIV related renal disease extensively described in adults but less so in paediatrics. Since the recent availability of anti-retroviral therapy (HAART) for both adults and children, this information is essential for appropriate management.

Objectives: Audit of HIV associated renal disease at 2 paediatric nephrology centers –Baragwanath Hospital (Johannesburg) group I; Red Cross Children's and Tygerberg Hospitals (Cape Town) group II.

Methods: Review of clinical presentation, histological findings, treatment and outcomes of paediatric HIV associated renal disease.

Results: 60 patients in group I and 19 patients in group II had HIV-associated renal disease with a predominance of females in both groups. Mean age at presentation (6.6 years (group I) and 5.9 years (group II)) of renal disease was older than in other HIV related disorders.

Proteinuria is a marker for renal disease with nephrotic syndrome the main presentation together with renal failure in 25% of cases. Severe urinary tract infections / pyelonephritis were seen in 23% of cases.

RENAL BIOPSIES	Group I (Total 60)	Group II (Total 19)
Number biopsied	52	19
Commonest finding	Immune complex disease Focal Segmental Sclerosis (FSGS)	HIVAN/FSGS Mesangial Proliferative glomerulonephritis.
Overall	A wide range of pathology was seen in addition to the commonly described HIVAN.	

In both group I and II, 16% of patients died, mainly due to end stage renal failure.

Conclusion: The age at presentation of HIV related renal disease was older compared to other organ system involvement in HIV infected children. There is a high degree of variability of pathology in children with HIV disease illustrating the importance of accurate diagnosis including the use of renal biopsies. The availability of HAART therapy has offered more hope for children with renal disease who may otherwise have progressed unabated to end stage renal failure.

Title: THE COMPARISON OF ACTUAL VERSUS PRESCRIBED INTAKE OF BURNS PATIENTS AT RED CROSS CHILDRENS HOSPITAL

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Aim: To determine the prescribed nutrition versus actual intake of burns children at Red Cross Childrens Hospital.

Background: Nutritional support may improve morbidity and mortality of severe thermal injury. There is increased energy requirements of an extensive burn injury as result of the induction of the hypermetabolic state. However there are complications of under and over feeding. Overfeeding can cause liver dysfunction, hyperglycemia and elevated CO₂ production. Underfeeding can delay wound healing and decrease resistance to infection. Therefore adequate nutritional support is essential to prevent overfeeding and underfeeding.

Method: All patients admitted with burns to Red Cross Childrens Hospital for at least 3 consecutive days were included in the study. The analysis of actual food intake, for 3 days, was completed with the use of MRC South African Food Composition Tables(1991), then compared to prescribed nutrition advised by a dietitian.

Results: A sample of 40 patients, were included in the study. Within this sample, 30 were minor burns and 10 were major burns. The major burns actual intake was analysed everyday. Of the small burns, 40% were overfed and 60% underfed. Only 3 of the minor burns actually met 75 % of the prescribed. Sixty percent of major burns were underfed by an average of 36%. Only 30% of the major burns actually met the prescribed nutrition intake.

Discussion: The possible reasons for the underfeeding could be related to long periods of starvation for surgery, inadequate assistance or caregivers to feed the children and the poor quality of the full ward diet. The major reason for overfeeding is high-energy supplement drinks or higher volumes are given without being prescribed by a dietitian.

Conclusion: Recommendations were to appoint a dedicated nurse, to ensure that all burns patients receive the prescribed nutrition and to improve the hospital full ward diet.

Title: TO DETERMINE ACTUAL VS. PRESCRIBED INTAKE OF CHILDREN WITH ONCOLOGICAL DISEASES AT RED CROSS WAR MEMORIAL CHILDREN'S HOSPITAL.

Authors: LV Marino

Aim:

To determine whether actual intake in children with oncological disease matches prescribed intake.

Methods:

A prospective audit was completed over a 9 month period assessing all paediatric patients < 13 years of age in the oncology unit. The ward dietician gathered anthropometrical, biochemical, clinical and nutritional data. The Waterlow and World Health Organisation criteria for weight for age, height for age and weight for height were used to determine the degree of malnutrition. Biochemistry data was recorded using standard ward tests. Clinical signs and symptoms of nutrition deficiencies were also recorded. Dietary intake records over 3 consecutive days were gathered from nursing intake and output records and analysed using Food Finder

Results:

26 patients were recruited of which 56% had solid tumours and 44% haematological malignancies.

The majority of the sample was of good nutritional status with 15% being moderately underweight, 4% severely stunted and 8% severely wasted. The Mid-upper arm circumference (MUAC) was taken in the majority of the patients with solid tumours, as weight is not deemed an accurate reflection of nutritional status. 14% of patients had a MUAC indicating severe malnutrition (<-3SD) and 50% of patients had a MUAC that indicated reasonable nutritional status. 21% of the solid tumours showed an increase in MUAC over the 3 courses of treatment, while 14% showed a decrease in MUAC. 17% of patients with haematological malignancies showed a decrease in weight over 3 courses of treatment.

20 patients qualified for nutritional intervention with 12% receiving enteral feeds via a nasogastric tube, 46% received liquid supplements, 19% received supplementary snacks, and 4% received parenteral nutrition. Patients receiving enteral feeds all received the correct prescribed feed but received the incorrect volume with a mean caloric deficit of 917 kcals. Patients receiving TPN received the prescribed TPN at the correct volume during the time that the audit was conducted. Of those patients receiving supplements only 50% received the prescribed feed with 40% receiving the incorrect volume. 67% of patients received the prescribed snacks with 50% receiving the incorrect volume.

The greatest deficit from requirements was seen in those patients receiving enteral feeds as this was their sole source of nutrition. Those patients receiving supplements met requirements as their intake from the ward diet were able to meet their prescribed requirements. This could however have been over estimated as the portion sizes consumed per meals were not always clearly indicated in the nursing notes.

Conclusion:

Nutritional therapy is adjunctive to anti-neoplastic therapy and is aimed at promoting weight gain and growth and enhances a sense of well being during treatment. The incorrect administration of dietary supplementation, as indicated by the results of this audit, could negatively affect the patient's nutritional status and impact on tolerance to therapy and toxicity threshold.

Title: SCREENING FOR ADRENAL SUPPRESSION IN SCHOOL AGE CHILDREN AT THE ALLERGY UNIT OF RED CROSS CHILDREN'S HOSPITAL: A PILOT STUDY

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Body: Background: It is impractical to test all asthmatic children on inhaled corticosteroids (ICS) for hypothalamic pituitary adrenal axis suppression (HPAS). A screening test would hence be useful.

Objective: To establish which clinical/biochemical parameter is a useful screening test for HPAS in asthmatic children.

Methods: 26 asthmatic children, 5-18 years, on ICS were recruited. Height velocity (HV), weight velocity (WV), height standard deviation score (SDS), weight SDS, change systolic blood pressure from supine to standing (Δ SBP) were recorded. Early morning urinary free cortisol (UFC) & cortisol metabolites (UCM), plasma cortisol & ACTH were collected. The 1-day metyrapone test was performed. Spearman correlations (r) were calculated between the post metyrapone ACTH and each screening variable. Diagnostic statistics were calculated for the most promising test.

Results:

Screening Tests	
Variable	r
Height SDS	0.02
Weight SDS	0.14
HV SDS	0.08
WV SDS	-0.32
Δ SBP	-0.03
cortisol	0.33
ACTH	0.68*
UFC(CMA ¹) (nmol/m ²)	0.17
UFC(GC/MS ²) (nmol/m ²)	-0.01
UFC(CMA) (nmol/mmolCr ³)	0.20
UFC(GC/MS) (nmol/mmolCr)	0.01
UCM (nmol/m ²)	-0.17
UCM (nmol/mmolCr)	-0.03

¹chemiluminescent assay ²gas chromatography/mass spectrometry ³creatinine *p<0.05

From the ROC curve an ACTH of 11.7 pg/ml was the optimal cut-point. Its performance: sensitivity 89(57-98)%, specificity 77(53-90)%, positive predictive value (PV) 67(39-86)%, negative PV 93(69-99)%, accuracy 81(61-94)%, positive likelihood ratio (LR) 3.8(1.1-6.4), negative LR 0.2(0.1-2.3).

Conclusion: ACTH is most useful. A larger study will refine its precision.

Title: THE USE OF HYDROXYUREA IN SICKLE CELL DISEASE.

Authors: NICHOLSON N.A., HARTLEY P.S., DESAI F., AND DAVIDSON A.

Objective: A retrospective pilot study was undertaken to assess the value of Hydroxyurea in reducing the morbidity in homozygous Sickle Cell Disease.

Methods: A retrospective review of all patients with Sickle Cell Disease currently being followed up by the Haematology Clinic was undertaken. 13 patients currently on treatment with Hydroxyurea to ameliorate thrombotic crises were evaluated using the following parameters indicating severity of morbidity. These were: number of admissions to hospital; number of inpatient days; number of blood transfusions received; number of thrombotic crises; and number of infections. Parameters before starting Hydroxyurea were compared with those whilst receiving this medication.

Results: Admissions decreased from an average of 2.7 admissions per year to 0.6 after commencement of Hydroxyurea. Inpatient days decreased from an average of 12.7 to 2.3 days per year. Likewise, a reduction was observed in the number of crises (from 1.95 to 0.5 per treatment year), number of blood transfusions (from 2.2 to 0.19 per year) and the number of infections (from 1.36 to 0.4 per year). Exceptional responses in 2 patients will be shown.

Conclusions: Hydroxyurea has made a difference to the morbidity in patients with homozygous Sickle Cell Disease as evidenced by a decrease in admissions, number of inpatient days, number of blood transfusions and number of thrombotic crises and infections.