Department of Paediatrics & Child Health

ANNUAL RESEARCH DAYS 2022

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Programme and Abstract Book

Tuesday, 01st and Wednesday, 02nd November 2022

VIRTUAL MEETING (ZOOM)

CPD Points for Tuesday, 01st and Wednesday, 02nd November 2022

Please complete online google form on both days to claim your points.

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Title: **THE UNIVERSITY OF CAPE TOWN PAEDIATRIC CANCER DATABASE: RESULTS FROM THE FIRST YEARS 2019-2021**

Authors: Alan Davidson[1],Jennifer Moodley[2],Komala Pillay[3],Marc Hendricks[1],Annemie Stewart[4], Jeannette Parkes[5]

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Objective:
The paediatric oncology multidisciplinary team at the University of Cape Town (UCT) developed a research-ready database to describe epidemiological profiles, biology, treatment and outcomes, and determine factors associated with presentation and outcome.

Methods:
A REDCap database was developed with a Cancer Association of South Africa grant, which employed an administrator to consent all new patients, record demographic and social information, and capture clinical information in real time.

Results:
There were 212 children consented from 2019 to 2021: 109 girls and 103 boys. Ages ranged from 1 day to 15.98 years. Only 15% of these families had medical insurance, 16% lived in informal housing and 12% did not have access to piped water. Seventy-four families (35%) reported a relative with cancer, including seven first degree relatives (one each from a retinoblastoma and a DICER family) and two cousins with acute myeloid leukaemia (AML). There were no specific or strong correlations between incident and associated cancers. Patient diagnostic groups included leukaemia (33%), lymphoma (11%), CNS tumours (14%), embryonal tumours (20%), sarcomas (12%) and germ cell tumours (6%). Most patients with solid tumours (72%) had advanced disease at diagnosis. The estimated 2-year overall survival was significantly different (p=0.013) by disease group: acute lymphoblastic leukaemia (78%), acute myeloid leukaemia (55%), lymphoma (96%), central nervous system tumours (60%), neuroblastoma (89%), retinoblastoma (75%), Wilms tumour (100%), hepatoblastoma (86%), rhabdomyosarcoma (52%) and germ cell tumours (100%). Outcomes were poorer for children living in informal housing (61% vs 80%; p=0.04) and without piped water (61% vs 79%; p=0.058). Children with a family history of malignancy did not have significantly poorer outcomes.

Conclusions:
Active inclusion of children and families in a robust database maintained in real time can provide a research-ready platform for interrogating cohort-specific factors impacting childhood cancer outcomes and generate new areas for research.

HREC R046/2015 and HREC 085/2022.

Title: **TRAINING OF AFRICAN FELLOWS IN PAEDIATRIC NEPHROLOGY IN AFRICA FOR AFRICA**

Authors: McCulloch MI[1], Nourse P, Coetzee A, du Buisson C, Reddy D, Buckley J, Sinclair PJ, Gajjar P, Semanska L, Morrow B, Argent AC, Warady B

Affiliation: [1]Department of Paediatrics and Child Health, University of Cape Town

Objective:
Access to care for children with kidney disease is limited and development of a paediatric nephrology (PN) workforce with good practical skills is critical, especially in poorly resourced countries. Prior training models where PN trained abroad, resulted in trainees not returning to their home institutions.

Methods:
Retrospective review of PN training program from 1999 – 2021 based at Red Cross War Memorial Children's Hospital (RCWMCH), University of Cape Town. Survey of fellows was used as the basis for the review as well as assessment of return to their home institutions.

Results:
38 Fellows trained (28 from 12 countries elsewhere in Africa) with funding from IPNA (International Paediatric Nephrology Association), ISN (International Society of Nephrology), ISPD (International Society of Peritoneal Dialysis) and APFP (African Paediatric Fellowship Program) over 1-2 year periods with a 100% initial return rate to their host centres.
Equal numbers of male and female trainees were trained in paediatric nephrology including in-and out-patient management of infants and children with renal pathology.
The training concentrated on mainly clinical paediatric nephrology as well as 'hands-on skills' including insertion of Peritoneal Dialysis (PD) catheters for Acute Kidney Injury (AKI) as well as renal biopsies which the Fellows felt were useful on their return.
Trainees (16) who were able to complete >1year of training were successful in completing Subspecialty Exams in 88% (14/16) and a Master's in Research in 56% (9/16).
Host centers are increasingly requiring formal qualifications on return with many PN fellows being promoted to positions of leadership. PN fellows reported that their training was appropriate, returning to State or University institutions and enabled them to make a difference in their communities in terms of PN care of and advocacy for children.
Despite the COVID19 pandemic, PN fellows were still able to complete their training although visits to adult nephrology units were curtailed.

Conclusions:
The concept of training in a 'Region for that Region' (e.g., training in Africa for Africa) is essential where 'hands-on' skills are required. Funding from organisations committed to paediatric nephrology made this program a success in a region well known for limited access for the care of children's kidney disease. The commitment of the PN fellows to their course is admirable with a 100% initial return rate.

HREC 646/2015

Title: **BRONCHIECTASIS IN AFRICAN CHILDREN: DISEASE BURDEN, AETIOLOGY AND CLINICAL SPECTRUM AT A PAEDIATRIC TERTIARY HOSPITAL IN CAPE TOWN, SOUTH AFRICA**

Authors: Muntanga K Mapani[1,2], Leah Githinji[2], Aneesa Vanker[2], Marco Zampoli[2], Diane M Gray[2]

Affiliation: [1]University Teaching Hospital, Children's hospital, University of Zambia, Ridgeway, Lusaka, Zambia [2]Department of Paediatrics and Child Health, University of Cape Town and MRC Unit on Child and Adolescent Health, University of Cape Town, South Africa

Objective:
Childhood bronchiectasis is an important cause of chronic lung disease globally, particularly in lower-middle-income countries (LMIC). Data from LMIC is lacking. We aimed to describe the disease burden, aetiology, and clinical spectrum of bronchiectasis in children attending a tertiary hospital in Cape Town, South Africa.

Methods:
A chart review of all patients 3 months to 15 years attending the respiratory clinic at Red Cross War Memorial Children's Hospital between January – December 2019. We included children diagnosed with bronchiectasis based on history of a recurrent (> 3 episodes / year) or persistent (> 4 weeks) wet cough, a clinical phenotype characterized by any of; exertion dyspnea, recurrent chest infections, growth failure, finger clubbing and chest deformity associated with radiographic features of bronchiectasis on chest X-ray or HRCT reported by a paediatric radiologist. Patients with cystic fibrosis were excluded.

Data Analysis:
Data was entered on a Redcap database from the clinical record file. Descriptive statistics were used to describe characteristics of the study population, clinical signs, symptoms and disease severity. For normally distributed data, mean and standard deviation (SD) were used; and median and interquartile range (IQR) for non-normally distributed data. The burden of bronchiectasis among the study population was expressed as count percent (proportion of patients with bronchiectasis against total patients in 2019). Summary proportions were used to express the aetiology of bronchiectasis.

Results:
Of 337 children seen during the study period, 58 (17.2%) had bronchiectasis diagnosed at mean (SD) age 34 (26) months, 32 (55%) being female. The commonest causes of bronchiectasis was post-infectious (25, 43.1%), and underlying immunodeficiencies (19 (32.8%) including 16/58 (27.6%) who were living with HIV and 3 (5.1 %) with primary immunodeficiency. Other causes included aspiration syndrome (8, 13.8 %) and anatomical abnormalities (4, 6.9%). Overall, Tuberculosis was the single commonest organism isolated (16/58, 27.6%) and commonest in children living with HIV (11/16, 68.8%). Cough was common (48/58, 82.8%) with wet cough being predominant (41/48, 85.4%), course crepitations 37/58 (64%), hyperinflation 24/58 (41%) finger clubbing 21/58 (36%), wheeze 17/58 (29%) and exertional dyspnea in 7/58(12%).

Conclusion:
Bronchiectasis is a common cause of chronic lung disease in South African children attending a paediatric respiratory clinic, mostly resulting from previous pneumonias, with tuberculosis the predominant infection. The importance of identifying underlying treatable causes is highlighted.

Funding: Department of Paediatric and Child Health Research Award, 2020

Title: **THE PREVALENCE OF PULMONARY HYPERTENSION IN CHILDREN WITH OBSTRUCTIVE SLEEP APNEA**

Authors: Khadar A Omer[(1)], Raphael Mlauzi[(2)], Wisdom Basera[(3)], Jessica McGuire[(2)], Heidi Meyer[(4)], John Lawrenson[(5)], Shazia Peer[(2)], Yanita Singh[(5)] and Marco Zampoli[(1)]

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Objectives:
Pulmonary hypertension (PH) secondary to obstructive sleep apnea (OSA) is an uncommon but serious perioperative risk factor in children undergoing surgery for tonsillar hypertrophy. Routine pre-operative echocardiography is commonly requested if severe OSA is suspected. We investigated the prevalence of PH in children with suspected OSA due to tonsillar hypertrophy and explored the association of PH and OSA severity.

Methods:
A prospective study of children with suspected OSA was conducted at Red Cross War Memorial Children Hospital (RCWMCH) in 2018-2019. Eligible children with suspected OSA had echocardiography and Overnight Oximetry (OO) performed at the same time. OSA severity was defined by McGill Oximetry Score (MOS): MOS 1-2 (mild-moderate) and MOS 3-4 (severe). Body mass index z-scores (BMIz) and tonsillar hypertrophy enlargement scores (1-4) were recorded. Mean pulmonary arterial pressure (mPAP) was estimated on echocardiographic criteria and PH defined as mPAP $\geq$ 20 mmHg. Univariate and multivariate logistic regression models were constructed to explore factors associated with severe OSA.

Results:
177 children median age 3.8 years (IQR 2.7- 6.4) were enrolled and 107 (60%) were female. Twenty-four (13.5%) were overweight (BMIz >1.0) and 102 (59%) had tonsillar enlargement grade 3/4. One hundred and twenty-eight (72%) and 49 (28%) children had mild-moderate and severe OSA, respectively. Severe OSA was most common in age group 2-5yrs (57%; p=0.02). Echocardiographic assessment for PH was successful in 166 children of which 10 (6%) had PH: 7 with mild-moderate OSA and 3 with severe OSA. The highest estimated mPAP was 27.0 mm. No significant difference in median mPAP and other echocardiographic indices was observed in children with mild-moderate (mPAP 16.0 mmHg: IQR 14.2-17.9) and severe OSA (mPAP 15.7 mmHg; IQR 14.2-17.3). After multivariable adjustment, only oxygen desaturation index (ODI) was significantly associated with severe OSA (OR 1.20; 95% CI 1.12-1.29).

Conclusion:
PH is uncommon in children with OSA due to tonsillar hypertrophy and there is no relationship of PH with severity of OSA measured by OO. Routine pre-operative echocardiography to exclude PH is not recommended for patients with OSA due to tonsillar hypertrophy.

Title: **PAEDIATRIC ACUTE RESPIRATORY DISTRESS SYNDROME (pARDS) IN SOUTH AFRICAN PAEDIATRIC INTENSIVE CARE UNITS – A MULTI-SITE POINT PREVALENCE STUDY**

Authors: Brenda M. Morrow[1], Andrew C. Argent[1], Eleonora Lozano[1], Mignon M[c]Culloch[1], Shamiel Salie[1], Asma Salloo[1], Ilse Appel[1], Elri Du Plooy[7], Shannon Cawood[3], Porai Moshesh[3], Kathryn Keeling[3], Lincoln J. Solomon[4], Sbekezelo Hlophe[5], Despina Demopoulos[6], Noor Parker[7], Ayesha Bibi Khan[2], Kuban D. Naidoo[2]

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Objective:
Paediatric acute respiratory distress syndrome (pARDS) has significant associated morbidity and mortality. The reported global incidence of pARDS is between 3-15%, with no published data from Southern Africa and poor representation from resource limited settings. This study aimed to describe the prevalence and characteristics of children admitted to participating South African paediatric intensive care units (PICU) with pARDS, defined using Pediatric Acute Lung Injury Consensus Conference (PALICC) criteria.

Methods:
This was a cross-sectional descriptive, multi-centre point-prevalence study of all children admitted to eight PICUs in four South African provinces. Data were collected on the 15th day of each month, for six months (February to July 2022), using a centralized REDCap© database.

Results:
310 patients (166, 53.5% male; median (IQR) age 9.8 (3.1 – 32.9) months) were included. The majority of children (243, 78.4%) were admitted as emergencies, most commonly with respiratory (124, 39.9%) and cardiac (53, 17.0%) disease. Comorbid conditions were common (184, 59.2%). Most patients (195, 62.9%) were invasively ventilated; 56 (18.1%) were on non-invasive ventilation or high flow nasal cannula oxygen support and 59 (19.0%) were not receiving ventilatory support.

71 (22.9%) patients were classified as being "at risk" of pARDS according to PALICC criteria whilst 95 patients (overall prevalence 30.6%; 95% CI 24.8% – 37.5%) fulfilled pARDS criteria. Severity of pARDS was further classified for the 91 children receiving invasive mechanical ventilation: mild (53, 58.2%), moderate (23, 25.3%) and severe (16, 17.6%). The proportion of PARDS cases differed amongst study sites ($chi^2 = 39.2$; $p < 0.001$).

Children with pARDS had higher median (IQR) admission PIM3 risk of mortality than those without pARDS (5.6 (3.4 – 12.1)% vs. 3.9 (1.0 – 8.2)%; p=0.002) and a greater proportion were receiving neuromuscular blockade on study days (15.8% vs 5.6%; p = 0.003), with no difference in age (p = 0.9), weight (p = 0.8), emergency vs. elective admission, presence of a comorbidity (p = 0.7) or sex (p = 0.2). The distribution of diagnostic categories differed between patients with and without pARDS (p = 0.002).

On multivariable binary logistic regression, admission PIM3 percentage risk of mortality (adjusted OR 1.43; 95% CI 1.15 – 1.77; p = 0.001); being admitted for the primary management of a respiratory condition (aOR 2.61; 95% CI 1.04 – 6.53; p = 0.04) and being admitted to a KwaZulu Natal PICU site (aOR 13.4; 95% CI 1.3 – 139.0; p = 0.03) were positively associated with the outcome of PARDS.

Conclusions:
The 30.6% prevalence of pARDS in South Africa is substantially higher than reports from other socio-geographic regions, highlighting the need for prospective studies to identify and mitigate the risk factors for and outcomes of pARDS in this region.

This is new research; HREC Rec/Ref: 507/2021

Title: **PROFILE OF CHILDREN WITH TRAUMATIC BRAIN INJURY ADMITTED TO THE INTENSIVE CARE UNIT, RED CROSS WAR MEMORIAL CHILDREN'S HOSPITAL, CAPE TOWN BETWEEN 2015 AND 2019**

Authors: Elri Du Plooy[1], Shamiel Salie[2], Anthony A Figaji[3]

Affiliation: [1]Department of Paediatrics and Child Health, University of Cape Town, Cape Town, South Africa [2]Department of Paediatrics and Child Health, University of Cape Town, Cape Town, South Africa [3]Division of Neurosurgery and Neuroscience Institute, University of Cape Town, Cape Town, South Africa

Objective:
Paediatric traumatic brain injury (TBI) is a public health problem with high morbidity and mortality. We aim to highlight risk factors and describe associated morbidity and mortality of children admitted to our Paediatric Intensive Care Unit (PICU) at Red Cross War Memorial Children's Hospital in Cape Town, South Africa.

Methods:
We retrospectively documented the hospitalization of all children with TBI admitted into our PICU during the 2015 -2019 study period.

Results:
Of 276 children identified, 232 were enrolled: 190 (81.9%) had severe TBI (Glasgow Coma Scale [GCS] ≤8), 32 (13.8%) moderate TBI (GCS 9-12) and 10 (4.3%) mild TBI (GCS ≥13). Median age was 6.5 (IQR 3.5-9) years; 144 (62.1%) were male. Motor vehicle accidents accounted for 77% (179) of injuries.
Two hundred (86.2%) children were invasively ventilated for median 3.5 (IQR 1-7) days; 26 (13%, n=200) had at least 1 failed extubation and 16/200 (8%) required tracheostomies. Ninety-eight children (42.2%) had intracranial pressure monitoring for median 5 (IQR 4-7) days. Almost 30% (67/232) required vasopressor support. Approximately a third (83/232) developed post-traumatic seizures; 25 children (10.8%) required a Thiopentone infusion and 9 with severe TBI (4.7%, n=190) a decompressive craniectomy. Common complications were post-extubation stridor (29 (12.5%)), hemiparesis (20 (8.6%)) and diabetes insipidus (15 (6.5%)).
Median PICU admission was 3 (IQR 1-8.3) days, and hospitalization 11 (IQR 5-20) days. Eighty-three (35.8%) children were transferred for further rehabilitation; 24 (10.3%) died.

Conclusions:
Children admitted to the PICU with TBI had considerable associated mortality and morbidity.
Enhanced primary preventative strategies, especially for motor vehicle accidents, are imperative to prevent TBI in children.

Title: **DESCRIBING THE NUTRITIONAL OUTCOMES FOLLOWING PAEDIATRIC LIVER TRANSPLANTATION AT A TERTIARY HOSPITAL IN SOUTH AFRICA**

Authors: Lesego Ndhlovu[1], Elizabeth Goddard, and Ronalda De Lacy

Affiliation: [1]Department of Paediatrics and Child Health, University of Cape Town

Background:
Nutritional status is a consideration in the assessment for liver transplantation in children with end-stage liver disease and is often monitored and optimised judiciously pre- transplantation. Following transplantation, the nutritional outcomes of these children may be influenced by the immunosuppressive agents used such as corticosteroids, calcineurin inhibitors, and thiopurine inhibitors; surgical complications; as well as complications unique to liver transplantation such as graft rejection and malignancies.

Aim:
To describe the nutritional outcomes of children following liver transplantation.

Methods:
A retrospective study of patient's receiving post-transplant care at the liver transplant unit at Red Cross War Memorial Children's Hospital in Cape Town, South Africa from 2004 – 2019.

Results:
31 children were included in the analysis. 35.0% [IQR: 24-81] were male; mean age at transplant was 58 months (SD 50). Predominant reason for transplant was biliary atresia in 74.2%. Pre-transplant prevalence of stunting was 60.9%, with 30.4% of children severely stunted. At 12 months post-transplant 64.3% children were stunted, with 50.0% severely stunted, and at 24 months post-transplant 64.3% were stunted, with 42.9% severely stunted. Overweight and obesity prevalence was 0% pretransplant, and 28.6% and 25.0% at 12- and 24-months post-transplant respectively.
Albumin levels recovered from 26 [24-30.5] pre-transplant to 39.5 [37-41] at 24 months after transplant.
32.2% of patients experienced at least one episode of transplant rejection and 58.1% developed hypertension. Stunting was significantly more prevalent in children with versus without hypertension [81.3% versus 41.7%; $p = 0.050$].

Conclusion:
The prevalence of obesity and stunting increased following liver transplantation, particularly in the first 12 months post-transplantation. It seems prudent to continue the monitoring of these children's nutrition post-transplantation to prevent the development of overnutrition and the metabolic complications thereof.

Title: **GRAVITY-ASSISTED CONTINUOUS FLOW PERITONEAL DIALYSIS (CFPD) TECHNIQUE USE IN ACUTE KIDNEY INJURY (AKI) IN CHILDREN: A RANDOMIZED, CROSSOVER CLINICAL TRIAL**

Authors: Nourse P[1], McCulloch, M[1], Coetzee A[1], Bunchman T[2], Picca S[3], Rusch J[4], Brooks A[5], Heyderych H[6], Morrow B[7]

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Background:
Increased ultrafiltration and clearances compared to conventional peritoneal dialysis (PD) have been demonstrated using continuous flow peritoneal dialysis (CFPD) in children with acute kidney injury (AKI), however existing techniques are expensive, with high-volume pumps needed to drive fluid circulation.

Aim:
To develop and test a novel gravity-driven CFPD technique in children using readily available, inexpensive equipment and to compare this technique to conventional PD.

Method:
After development and initial *in vitro* testing, a randomised cross-over clinical trial was conducted between 2018 - 2021 in 15 children with AKI requiring dialysis. Patients received both conventional PD and CFPD, sequentially in random order. Primary outcomes were measures of feasibility, clearance, and ultrafiltration (UF). Secondary outcomes were complications and mass transfer coefficients (MTC). Paired t-tests were used to compare PD and CFPD outcomes.

Results:
Mean (range) age and weight of participants were 8.0 (0.2-14) months and 6.3 (2.3-14.0) kg respectively. The CFPD system was easily and rapidly assembled. There were no serious adverse events attributed to CFPD. Mean ± SD UF was significantly higher on CFPD compared to conventional PD (4.3 ± 3.15 ml/kg/hr vs. 1.04 ± 1.72 ml/kg/hr; $p<0.001$). Clearances for urea, creatinine, and phosphate for children on CFPD were 9.9 ± 3.10, 7.9 ± 3.3 and 5.5 ± 1.5 ml/min/1.73m^2 compared to 4.3 ± 1.68, 3.57 ± 1.3 and 2.53 ± 0.85 ml/min/1.73m^2 respectively with conventional PD (all $p < 0.001$).

Conclusion:
Gravity assisted CFPD appears to be a feasible, safe, cheap, and effective way to augment ultrafiltration and clearances in children with AKI.

HREC Rec/Ref: 363/2017

Title: **EVALUATION OF THE IMPLEMENTATION OF A 'PAEDIATRIC FEASIBILITY ASSESSMENT FOR TRANSPLANTATION' (PFAT) FORM IN CHILDREN AND ADOLESCENTS AT RED CROSS WAR MEMORIAL CHILDREN'S HOSPITAL (RCWMCH), CAPE TOWN, SA**

Authors: Adetunji AE[1], Gajjar P, Luyckx V, Reddy D, Collison N, Abdo T, Pienaar T, Nourse P, Coetzee A, Morrow B, McCulloch M

Affiliation: [1]Department of Paediatrics and Child Health, University of Cape Town

Introduction:
Kidney transplantation, remains the treatment of choice for children with ESKD. Kidneys are a scarce resource and should be allocated to those where success is likely. Predicting success however is challenging. Experience of challenging cases with poor outcomes led to the development of the 'Paediatric Feasibility Assessment for Transplantation' (pFAT) form at RCWMCH in Cape Town, after critical evaluation of graft and patient survival over three decades, which highlighted the need to develop a more objective and transparent system with which to list patients for kidney transplantation and reduce moral distress among clinicians.

Objective:
Evaluation of implementation of the pFAT form in all children evaluated for dialysis/kidney transplantation to identify factors most associated with listing/non-listing for transplantation, and to assess outcomes among those listed for transplantation.

Methods:
Anonymized data was extracted from the Paediatric Nephrology database of all patients <18years evaluated for dialysis/transplantation with the pFAT form at RCWMCH from 2015 – 2021.

Results:
Table 1 shows characteristics of the patients assessed. Children not listed scored very low in social support, adherence, and caregiver concerns. Forty children have been transplanted, 32 have completed 1 year follow-up. Despite low 1 year graft survival of 84.4% (27/32) due to medical issues, no grafts were lost due to psychosocial issues.
Table 1: Characteristics of the patients assessed.

	All Patients 88 N (%)	**Listed for Dialysis /Transplant 58 N (%)**	**Not listed 30 (unfavourable pFAT) N (%)**	**P value**
Age (SD) years	11.0 (4.1)	10.9 (4.3)	11.0 (3.9)	0.9
Male: Sex	47 (53.4)	26 (44.8)	21 (70.0)	0.04
Adherence concerns*	33 (37.5)	11 (19.0)	22 (73.3)	<0.001
On medical insurance	14 (15.9)	13 (22.4)	1 (3.3)	0.032
Parental substance abuse	18 (20.5)	5 (8.6)	13 (43.3)	<0.001
Family income:H0&H1[#] H2 H3 & Private	63 (71.6) 3 (3.4) 22 (25.0)	37 (63.8) 2 (3.4) 19 (32.8)	26 (86.7) 1 (3.3) 3 (10.0)	0.02
Total pFAT Score	12.9 (9.5 – 15.0)	14.5 (13.1 – 15.5)	8.6 (7.5 – 9.8)	<0.001

Adherence concerns* included adherence to chronic kidney disease medication and clinic follow-up.
[#]H0 & H1 Low income, H2 middle income & H3 high income and private.

Conclusions:
The pFAT form was useful in objectively assessing family and patient characteristics allowing a more transparent way of listing patients. The Form highlights more clearly the factors that most frequently lead to non-listing for transplantation. Such information emphasises the urgent need to implement psychosocial support for remediable factors such as adherence as to find ways to address socio-economic barriers such as poverty and medical insurance, which need a more comprehensive approach. Among those transplanted, no grafts were lost due to psychosocial issues suggesting the current form is associated with successful transplantation.

Ethics: HREC 211/2022

Title: **COMPARISON OF DEMOGRAPHICS, PRESENTATION AND SHORT-TERM OUTCOMES IN MIS-C ACROSS DIFFERENT VARIANTS OF SARS-COV-2 IN CAPE TOWN, SOUTH AFRICA**

Authors: Claire Butters[1], Deepthi Raju Abraham[2], Heidi Facey-Thomas[1], Jonathan Day[1], Timothy Spracklen[1], Helena Rabie[2], Christiaan Scott[1], Liesl Zühlke[1], Kate Webb[1].

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Introduction:
The impact of the various waves driven by variants of concern (VOC) of SARS-CoV-2 on Multisystem Inflammatory Syndrome in Children (MIS-C) is not yet understood.

Objectives:

i. Describe the demographic features of MIS-C across the four SARS-CoV-2 waves driven by four VOCs.
ii. Compare the clinical features and outcomes of children with MIS-C across the four waves of SARS-CoV-2.

Methods:
Children with MIS-C admitted to the Red Cross War Memorial Children's Hospital (RXH) and Tygerberg Hospital (TBH) between 22 June 2020 and 27 March 2022 were recruited with consent (599/2020). Demographic, clinical and outcome data were recorded.

Results:
There were four SARS-CoV-2 waves experienced in Cape Town, South Africa during the time period. These waves were driven by the wildtype, beta, delta and omicron VOCs. During the time period, 66 children from RXH and 63 children from TBH met the case definition for MIS-C. There was no significant difference in age across the four waves, however children in the fourth wave tended to be younger. There was no difference in sex distribution or the number of children with comorbidities. The presence of clinical signs and symptoms remained relatively constant with only diarrhoea being less prevalent in the wave driven by Omicron ($p=0.028$). Blood levels of inflammatory, coagulation and cardiac markers, immune cells, and sodium were unchanged throughout the four waves. Abnormal echo findings were common, but no more so in one wave than another. However, there was a trend towards an increase in the presence of coronary artery involvement in the second and third waves ($p=0.056$) and reduced ejection fraction in the first and fourth waves ($p=0.065$). There was no difference in the need for ICU admission, inotropic support or length of hospital stay. There was only one death in the wave driven by the Omicron variant.

Conclusion:
Overall, there does not appear to be a difference in the demographic, clinical features or outcomes of MIS-C across the four waves of SARS-CoV-2 infection in Cape Town, South Africa.

Title: **EFFECTS OF THE COVID-19 PANDEMIC ON EARLY INFANT TESTING AND DIAGNOSIS OF HIV IN CAPE TOWN, SOUTH AFRICA**

Authors: Hendrike van Vollenhoven[1], Emma Kalk[2], Stuart Maxwell Kroon[3], Maseko Tafadzwa[4], Florence Phelanyane[5], Jonathan Euvrard[5], Lezanne Fourie[6], Nicolene le Roux[7], Phumza Nongena[8]

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Introduction and objectives:
The South African National Prevention of Mother to Child Transmission (PMTCT) Programme now includes HIV polymerase chain reaction (PCR) testing for all HIV exposed infants at birth and 10 weeks as standard care. This emphasis on testing has improved early infant diagnosis but concerns remain about high attrition rates from the PMTCT programme. The state of national disaster and the lockdown due to the COVID-19 pandemic was associated with limited movement for non-essential services and the reduction of routine health care service provision. There are few data on how the uptake of early infant HIV testing was affected. This study describes the effects of the COVID-19 pandemic and associated lockdown on early infant testing and diagnosis of HIV in Cape Town, South Africa.

Methods:
We conducted a retrospective cohort study comparing HIV-exposed infants born during a six-month period spanning the initial COVID-19 lockdown to HIV exposed infants born in the same period in the preceding year. All live born, HIV exposed infants, born at Mowbray Maternity Hospital and New Somerset Hospital between 1 March - 31 August 2019 and 1 March - 31 August 2020 were included. Demographic, laboratory, and health care facility attendance data were abstracted from the Western Cape Provincial Health Datacentre Database and on-site birth and PCR testing registers. We defined a birth PCR as an HIV PCR test taken within 7 days of birth and a 10-week PCR as any HIV PCR taken between 6 and 14 weeks of birth.

Results:
A total of 2888 infants were included in this study. Of these infants 1413 were born March – August 2019 and 1475 born March - August 2020, during the COVID-19 lockdown.

There were no significant differences in birth PCR testing uptake between the two time periods, which remained above 80% (p-value 0.109). However, there was a significant improvement in the 10-week PCR uptake in 2020 compared to 2019 (71% vs 60% p-value <0.001). Although more than 90% of infants had at least one PCR done in both years, more infants born in the 2020 cohort had both birth and 10-week PCR testing than in 2019 (61% vs 52% p-value <0.001).

Importantly, of the infants who did not undergo 10-week testing (n=432 in 2020 and n=564 in 2019), a significantly higher proportion had demised (8% vs 5% p-value 0.017) or were lost to follow up (25% vs 17% p-value 0.025) in the 2020 cohort.

While there was no significant difference in birth HIV positivity rates between the two groups (1% vs 0.5% p-value 0.176), there was a significant increase in the overall percentage of infants testing HIV positive by the 14th week after birth in the 2020 compared to 2019 group (1.25% vs 0.46%. p- value 0.046).

Conclusion:
Although there was no significant change in birth PCR HIV positivity rates between the two groups, overall HIV transmission rates by 14 weeks showed a significant increase. In addition, there was a significant increase in death or loss to follow-up at 10 weeks in the 2020 group.

Ethics approval number: 174/2021
New research – not yet presented at research day

Title: **IMPACT OF COVID-19 ON A PAEDIATRIC CARDIAC SERVICE**

Authors: Thomas Aldersley[1], Andre Brooks[2], George Comitis[1], Rik De Decker[1], Barend Fourie[3], Paul Human[2], John Lawrenson[1,3], Rodgers Manganyi[2], Harold Pribut[1], Shamiel Salie[3], Lenise Swanson[1], Liesl Zühlke[1, 4]

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Background & Objectives:
The Western Cape paediatric cardiology and cardiothoracic surgery service is in general under resourced and any interruption to this service may have long term effects. We aimed to quantify the impact of COVID-19(C19) regulations on the Paediatric Cardiology service of the Western Cape and the paediatric division of the Chris Barnard Division of Cardiothoracic Surgery.

Methods:
An uncontrolled retrospective pre-post study of patients presenting to the service over two, one-year periods; the pre-C19 period (01/03/2019-29/02/2020) and the peri-C19 period (01/03/-28/02/2021). Measures include the number and type of surgical procedures, cardiac catheterisations, admissions and out-patient consultations.

Results:
Admissions decreased by 40% from 625 in the pre-C19 period to 378 in the peri-C19 period. Similarly, out-patient visits decreased from 4241 to 3921. There was no significant change in presentation-age or diagnosis, however, admission-duration was significantly longer ($p<0.001$), three days (IQR:1-9) pre-C19 versus six (IQR:2-14) peri-C19.

Cardiac surgeries decreased by 29% from 298 to 213, with significant changes in the proportion of urgent (Prevalence Ratio[PR]:5.84; 95%CI:3.55-9.63, $p<0.001$) and elective cases (PR:0.73, 95%CI:0.66-0.82, $p<0.001$). Median age at surgery was significantly lower, 0.6 years (IQR:0.2-1.7) peri-C19 versus 0.9 years (IQR:0.4-4.1) pre-C19, related to a significant increase in neonatal procedures (PR:2.48, 95%CI:1.52-4.06, $p<0.001$) and decrease in patients aged 5 to 12 (PR:0.57, 95%CI:0.37-0.90, $p<0.05$). Risk Adjustment for Congenital Heart Surgery (RACHS-1) severity scores were similar across periods.

Cardiac catheterisations decreased by 42% (175 to 102) with no significant change in procedure-age, urgency or the proportion of interventions.

Conclusion:
The number of cardiac procedures was significantly reduced in the peri-C19 period which will have implications on an already overburdened service and ultimately, patient outcomes. Although RACHS- 1 was similar between periods, the higher proportion of urgent cases, neonatal procedures, and increased admission-duration indicates a higher proportion of severe or complicated cases. This together with reduced caseloads may have implications on training.

HREC: 092-2022
This abstract represents new research.

Title: **FAMILIES AND CHILDREN WITH DISABLING CONDITIONS: LIFE DURING THE COVID-19 PANDEMIC IN SOUTH AFRICA**

Authors: Sashmi Moodley [1], Kirsten Reichmuth [1], Erna van der Westhuizen [3], Michael Hendricks [1], Francisca Velasquez Turner [3], Shona McDonald [3], Kirsten A Donald [1,2]

Affiliation: [1]Department of Paediatrics and Child health, Red Cross War Memorial Children's Hospital of Cape Town, Western Cape, South Africa; [2]Neuroscience Institute, University of Cape Town, South Africa; [3]Shonaquip Social Enterprise

Background:
Children with disabilities face risks to nurturing care that were accentuated in low-and middle-income countries during the COVID-19 pandemic. This study gives parents of children with special needs, the opportunity to report their experiences.

Methods:
Members of the University of Cape Town and Shonaquip Social Enterprise (SSE), a partnering organisation, undertook the research during the COVID-19 pandemic in late 2021. Approximately 400 parents from their online network, born during the pandemic, were invited to participate in an online survey. Their responses were analysed using Stata statistical software.

Results:
Sixty-eight (17%) parents completed the survey. Twenty-three (35%) were unemployed pre- COVID-19 while 17 (25%) lost income during the pandemic. Food shortages were experienced by 63% of families, 15% received food from nongovernmental organizations and only two (3%) reported access to purchasing food online. Children aged 5-12 years represented 49% of the group. Eleven parents (16%) reported child health worsening compared to before the pandemic; 12 (18%) and 66 (45%) reported child health as better or unchanged, respectively. Concerns included children's difficulty tolerating masks (37, 54%), children contracting infection at hospitals (24, 35%) and concerns about caregivers falling ill (14, 21%). Six (9%) children contracted COVID-19 infection and two (3%) children demised. Families (22, 40%) opted not to send their children back to school by the third wave of infections. The positive experiences of lockdown were reported as family time (28, 41%) and reaching out to other families (32, 46%). Parents reported being very stressed (60%), with 5 (7%) revealing a need for substances to cope. Only, eleven parents (16%) reported telephonic contact from health providers. Parents (50, 74%) reported feeling that care for children with disabilities was not prioritized in South Africa. One parent reported that *'it was just a normal day'*.

Conclusion:
The study is a snapshot of the heightened biopsychosocial threats during the pandemic to an already fragile landscape of childhood disability. Advocating for vulnerable groups required innovation by key stakeholders despite digital divides within communities. We include voices of parents into the research agenda highlighting challenges that need greater awareness and strong collaboration to evoke change in practice.

Title: **A COMPARISON OF CHARACTERISTICS AT DIAGNOSIS OF TYPE 1 DIABETES TWO YEARS BEFORE THE PANDEMIC OF SEVERE ACUTE RESPIRATORY SYNDROME CORONAVIRUS 2 2019 (SARS COVID-19) INFECTION (MARCH 2018-MARCH 2019) AND TWO YEARS DURING THE PANDEMIC (MARCH 2020-MARCH 2022) IN CHILDREN AND ADOLESCENTS AT RED CROSS WAR MEMORIAL CHILDREN'S HOSPITAL AND GROOTE SCHUUR HOSPITAL**

Presenting Author: Melezwa Ndamase[1]; Supervisor: Michelle Carrihill[1]

Affiliation: [1]Department of Paediatrics and Child Health, University of Cape Town

Background:
The announcement of the world pandemic with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causing coronavirus disease (COVID-19) in March 2020 with subsequent lockdowns had an impact on the delivery of health services and significantly limited accessibility (1) During the periods of peak waves of COVID-19 it has been noted that the access to paediatric emergency units was significantly reduced due to the fear of acquiring the infection. There is paucity of information about coronavirus disease (COVID 19) caused by severe acute respiratory syndrome corona virus 2 2019 (SARS-CoV-2) in children with type 1 diabetes mellitus in South Africa and in Africa at large.

Objectives:
Describing the characteristics at presentation of Type 1 Diabetes in the Red Cross War Memorial Children's Hospital (RCWMCH) and Groote Schuur Hospital (GSH) before COVID-19 and during COVID-19 and evaluating if there are any changes in presentation including clinical and biochemical features.

Methods:
This was retrospective folder review done at the Red Cross War Memorial Children's hospital and Groote Schuur Hospital of all children and adolescents presenting with a new diagnosis of Type 1 DM from 26/03/2018 to 25/03/2020 and from 26/03/2020 to 25/03/2022 (before and during the COVID-19 pandemic). Participant data was collected from clinic files and medical records with reference to the diabetic clinic registry. Ethics approval was received from the University of Cape Town faculty of Human Research Ethics Committee and permission to conduct study granted by RCWMCH and GSH management prior to collection of data.

Results:
A total of 172 patients were included in this study and of these 89 were diagnosed before the COVID-19 pandemic and 83 during the pandemic. The majority of patients presented in DKA both pre-COVID-19 and during COVID-19 pandemic at 60% and 63% consecutively. Those admitted during the pandemic presented with a more severe DKA with 40% presenting with moderate-severe DKA during the pandemic compared to 28 % before COVID-19 pandemic.

Conclusion:
There was no increase in the number of patients presenting with type 1 diabetes mellitus during COVID-19 pandemic but there was worsening in clinical presentation which could have been potentially worsened by fear of presenting to health care facilities during the Pandemic.

Title: **URINARY TRACT INFECTION IN CHILDREN AT VICTORIA HOSPITAL, A DISTRICT HOSPITAL IN CAPE TOWN, SOUTH AFRICA**

Authors: DC Shepherd,[1]; HD Tootla,[2]; CM Centner,[3]; JJC Nuttall,[4]

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Background:
Urinary tract infections (UTI) are one of the most common bacterial infections in childhood, with the potential to cause acute and long-term complications. Diagnosing UTI in children is often challenging due to non-specific symptoms, difficulty in collecting sterile specimens, and culture results only becoming available after 24-48 hours, necessitating initiation of empiric antibiotic therapy. Recent data on the epidemiology and antibiotic susceptibility profile of community-acquired bacterial UTI in children in Cape Town is lacking.

Objectives:
To describe the clinical profile and organisms including antibiotic susceptibility testing (AST) results in children <10 years of age with community-acquired, culture-confirmed bacterial UTI attending Victoria Hospital, Cape Town. To compare the AST findings with the current South African (SA) Hospital Level Paediatric Standard Treatment Guidelines (STG) which recommend oral or parenteral amoxicillin/clavulanic acid as first-line empiric treatment for children with UTI, with ceftriaxone included as an alternative for neonates or acutely ill infants.

Methods:
A retrospective review of medical records and laboratory results of children <10 years of age who had a urine specimen submitted for culture and AST to the National Health Laboratory Service from Victoria Hospital between 1 February 2016 – 31 July 2019 was performed. Descriptive statistics were used to analyse the data.

Results:
From 528 urine specimens submitted, 89 specimens met the study definition of bacterial UTI and were included in the microbiological analysis. Seventy-eight children with available medical records were included in the demographic and clinical analysis. Median (interquartile range) age was 25 (0;117) months and 58% were female. One or more non-specific features of systemic illness were reported in 65% of children, and 51% had at least one symptom specific to the urinary system. *Enterobacterales* accounted for 99% of the organisms cultured (85% were *Escherichia coli*) and their susceptibility was amoxicillin/clavulanic acid (58%), cefuroxime (84%), third and fourth generation cephalosporins (88%), ciprofloxacin (94%), gentamicin (86%) and nitrofurantoin (90%). Eleven (12%) isolates were extended spectrum beta lactamase-producing organisms but no carbapenem-resistant organisms were isolated.

Conclusion:
Although this study did not evaluate clinical outcomes of children, the AST finding that only 58% of *Enterobacterales* isolates were susceptible to the recommended empiric treatment with amoxicillin/clavulanic acid raises the concern that children may not be receiving appropriate treatment for UTI. Further research is needed on the antibiotic susceptibility profile and clinical outcome of children treated for UTI in order to inform appropriate empiric antibiotic treatment recommendations.

Title: **GENETICS OF DEVELOPMENTAL AND EPILEPTIC ENCEPHALOPATHIES IN SOUTH AFRICAN CHILDREN – RELEVANCE TO PRECISION MEDICINE**

Presenting Author: Alina Esterhuizen[1]; PhD Project Supervision: Profs R. Ramesar[1], G.L. Carvill[2], J.M. Wilmshurst[3]

Affiliation: [1]Division of Human Genetics UCT/NHLS; [2]Northwestern University, Chicago, USA; [3]Paed. Neurology, RCWMCH/UCT

Purpose:
Sub-Saharan Africa bears the highest burden of epilepsy worldwide. A presumed proportion is genetic, but this aetiology is buried under the burden of infections and perinatal insults, in a setting of limited awareness and few options for testing. Children with developmental and epileptic encephalopathies (DEEs), are most severely affected by this diagnostic gap, as the rate of actionable findings is highest in DEE-associated genes. We report the results of research-based genetic analyses of South African children clinically diagnosed with DEE, highlighting the clinical utility of informative findings and relevance to precision medicine for DEEs in South Africa.

Methods:
We recruited 234 genetically naïve South African children with drug-resistant epilepsy and a diagnosis or suspicion of DEE, between 2016 and 2019. All probands were genetically tested using a gene panel. Of the panel-negative probands, 78 were tested with chromosomal microarray and 20 proband/parent trios underwent exome sequencing. Statistical comparison of electroclinical features in children with and without candidate variants was performed to identify characteristics most likely predictive of a positive genetic finding.

Results:
Of 41/234 children with likely/pathogenic variants, 26/234 had variants supporting precision therapy. Multivariate regression modelling highlighted neonatal or infantile-onset seizures and movement abnormalities as predictive of a positive genetic finding. We used this, coupled with an emphasis on precision medicine outcomes, to propose the pragmatic "Think-Genetics" decision tree for early recognition of a possible genetic aetiology, pragmatic testing and multidisciplinary consultation.

Conclusion:
Our findings emphasise the relevance of an early genetic diagnosis in DEE and highlight the importance of access to genetic testing. We designed the "Think-Genetics" strategy for early recognition, appropriate interim management and genetic testing for DEE in resource-constrained settings. The recent withdrawal of the Invitae services from South Africa further highlights the pressing need for augmentation of the local genetic laboratory services, to incorporate gene panels and exome sequencing.

Title: **CLINICAL CHARACTERISTICS AND NEURORADIOLOGICAL FINDINGS AMONG CHILDREN WITH DYSTONIA (EXCLUDING DYSTONIC CEREBRAL PALSY) IN THE WESTERN CAPE OF SOUTH AFRICA**

Authors: Ali Nasreldien, Alvin Ndondo & Jo Wilmshurst

Affiliation: Department of Paediatrics and Child Health, University of Cape Town

Objectives:
To delineate clinical and radiological features of children with dystonia from Western Cape of South Africa.

Methods:
A retrospective observational study of children with dystonia excluding those with dystonic cerebral palsy. Data captured demographics, phenotypic and investigational aspects. Ethical approval and consent were obtained, the data collected from RCWMCH, pediatric neurology department, patients with dystonia from 2010 – 2021.

Results:
53 children met inclusion criteria of dystonia (Male1.2: Female1). Children presented <1year (32%), 1-3years (28%), 3-5years (36%), and >5years (4%). 15 had a family history of dystonia. Most patients had generalized dystonia (n=36(72%)) and 21(42%) had severe dystonia. Neuroregression occurred in 24%(n=12), learning difficulties in 34(68%) and 12 had epilepsy. 10 also had dyskinesia and 8 tremor and ataxia. Triggers were infection in 38% and exercise in 18%. Etiologies included bilirubin encephalopathy (n=1), post meningitis/encephalitis (n=7), Glutaric aciduria (n=9), suspected neurodegeneration with brain iron accumulation (n=9) and autoimmune etiology (n=1). Brain MRI was normal in 23(46%), 11(22%) had bilateral symmetrical basal ganglia enhancement, 10(20%) cortical involvement post-encephalitis and 33(66%) had basal ganglia and subthalamic injury. 24 patients underwent genetic testing, five had *GCDH* mutations (Glutaric aciduria) and one had *SGCE* mutation (DYT11 dystonia myoclonus syndrome). L-dopa was prescribed with benefit in 18(36%) patients.

Conclusions:
Our study identified a significant number of children with dystonia related to genetic or post infectious etiologies. In our setting with frequent hypoxic birth insults these potentially treatable etiologies are often missed. Early recognition and referral could improve the potential outcomes for these children with collaborative multidisciplinary team approach and management.

Title: **EPILEPTIC SPASMS: A SOUTH AFRICAN PERSPECTIVE OF AETIOLOGIES, INTERVENTIONS AND OUTCOMES**

Authors: Sharika V Raga[1], Farida Essajee, Regan Solomons, Ronald Van Toorn, Jo M Wilmshurst

Affiliation: [1]Department of Paediatrics and Child Health, University of Cape Town

Aim:
To better understand the aetiologies of epileptic spasms (ES) in infants, as well as safety and efficacy of high dose corticosteroids (first line hormonal therapy) in tuberculosis (TB) and human immunodeficiency virus (HIV) endemic resource-limited settings.

Method:
Retrospective analysis of infants with ES managed at the tertiary referral centres in the Western Cape, South Africa.

Results:
Of 175 children diagnosed with ES from 2000-2020 (n=133 from Red Cross War Memorial Children's Hospital, n=42 Tygerberg Hospital). Median age of onset was 6 months (IQR 4-8 months). Structural aetiologies were most common, 115/175 (66%), with 2/3 related to perinatal insults. A lead time to treatment of less than 1 month was more likely in the epileptic encephalopathy (EE)/developmental and epileptic encephalopathy (DEE) group, 58/92 (63%), compared to 28/76 (37%) of those with developmental encephalopathy (DE) (p=0.001). Failure to recognise preceding developmental delay was common. Ninety-nine (57%) received first-line hormonal therapy eg. adrenocorticotropic hormone (ACTH). A total of 111/172 (65%) of children from the DE and EE/DEE groups had clinical and/or EEG resolution of spasms within 14 days. Clinical and/or EEG resolution was more common among children with EE/DEE (74/94, 79%) compared to children with DE (37/78, 47%; p<0.001). Children in whom an aetiology could not be identified were statistically more likely to have moderate to profound developmental delay at 1 year of age, 33/44 (75%)(p=0.001).

Interpretation:
Whilst this is the largest cohort of infants with ES from sub-Saharan Africa, the study size is less than expected, this may reflect misdiagnosis and failure of referral pathways. Despite a reported shorter lead time to treatment, infants with DEE had worse developmental outcomes compared to international studies. Hormonal therapy was safe and effective in our setting, as no adverse events were reported, despite exposure to high levels of TB and HIV.

Ethics approval: HREC Ref 669/2017

Title: **ASSOCIATION OF MATERNAL AND CHILD ANAEMIA WITH BRAIN STRUCTURE IN EARLY LIFE: A SOUTH AFRICAN BIRTH COHORT STUDY**

Authors: Catherine J Wedderburn MRCPCH,[1,2,3] Jessica E Ringshaw MA,[1,2] Kirsten A Donald PhD,[1,2] Shantanu Joshi PhD,[4,5] Sivenesi Subramoney MA,[1] Jean-Paul Fouche PhD, [1,2] Jacob A M Stadler MBChB,[6] Whitney Barnett PhD,[1,6] Andrea M Rehman PhD,[7] Nadia Hoffman BA,[8] Annerine Roos PhD,[1,9] Katherine L Narr PhD,[4] Heather J Zar PhD,[1,6] Dan J Stein PhD[2,8,10]

Affiliation: [1.]Department of Paediatrics and Child Health, Red Cross War MemoriaChildren's Hospital, University of Cape Town, South Africa; [2.]Neuroscience Institute, University of Cape Town, South Africa; [3.]Department of Clinical Research, London School of Hygiene & Tropical Medicine, UK; [4.]Departments of Neurology, Psychiatry and Biobehavioral Sciences, University of California Los Angeles, CA, USA; [5.]Department of Bioengineering, University of California Los Angeles, USA; [6.]South African Medical Research Council (SAMRC), Unit on Child & Adolescent Health, University of Cape Town, South Africa; [7.]MRC International Statistics & Epidemiology Group, London School of Hygiene & Tropical Medicine, London, UK; [8.]Department of Psychiatry & Mental Health, University of Cape Town, South Africa; [9.]SA MRC Unit on Risk and Resilience in Mental Disorders, Department of Psychiatry, Stellenbosch University, South Africa; [10.]SA MRC Unit on Risk and Resilience in Mental Disorders, Department of Psychiatry & Neuroscience Institute, University of Cape Town, South Africa

Objectives:
Anaemia affects millions of women and children worldwide, particularly in low- and middle-income countries. Although maternal anaemia in pregnancy has consistently been associated with poor neurodevelopmental outcomes, little is known about its impact on the structure of the developing child brain. We explored the relationship between maternal anaemia, child anaemia, and child brain structure at 2-3 years of age.

Methods:
Pregnant women were enrolled into the Drakenstein Child Health Study (DCHS), a South African population-based birth cohort, between 2012-2015. Mother-child pairs were followed prospectively and a sub-group of children had magnetic resonance imaging (MRI) at 2-3 years of age from 2015-2018. Mothers had haemoglobin measurements during pregnancy, and a sub-group of children during early life. Linear regression models were used to analyse the associations between maternal anaemia status, child anaemia status, and child brain volumes, accounting for potential confounders. For brain regions with a significant association ($p<0.05$), separate multivariable linear regression models were explored using standardised regression coefficients for continuous haemoglobin concentrations. To validate our analyses, we performed several sensitivity analyses adjusting for pregnancy trimester and prevalent DCHS risk factors including maternal smoking, alcohol, and HIV.

Results:
In the neuroimaging sub-group, the prevalence of maternal anaemia in pregnancy (haemoglobin <11g/dL) was 31.3% (46/147; median gestation of measurement 13 weeks). Among 147 children with high-resolution brain scans, maternal anaemia was significantly associated with smaller volumes of the child caudate bilaterally (percentage difference -5.30%; $p=0.010$), putamen (L- hemisphere; -4.33%, $p=0.038$), and corpus callosum (-7.75%, $p=0.006$). Maternal haemoglobin level predicted brain volumes in these regions ($p<0.05$). Child anaemia prevalence was 52.5% (42/80; median age of measurement 8.0 months). In this cohort, child anaemia was not associated with brain volumes ($n=80$; $p>0.05$), nor did it mediate the effect of antenatal maternal anaemia. The identified associations between antenatal maternal anaemia and subcortical and corpus callosum volumes were found to be robust, and coefficients held, in the described series of sensitivity analyses.

Conclusions:
The findings of this cohort study suggest that anaemia in pregnancy is associated with altered child brain structure. Maternal anaemia in pregnancy is a global health priority which may have long-term, persistent consequences for the developing child brain. Given the high prevalence of antenatal maternal anaemia worldwide and its contribution to lost developmental potential, optimising interventions during pregnancy may improve child brain outcomes.

Key Words: Anaemia, pregnancy, child, brain structure, haemoglobin, magnetic resonance imaging
HREC Reference Number: 525/2012

Title: **REGIONAL NEUROMETABOLITE CONCENTRATIONS AND HOW THEY RELATE TO FUNCTIONAL NEURODEVELOPMENTAL OUTCOMES IN CHILDREN WHO ARE HIV-EXPOSED UNINFECTED: FINDINGS FROM A SOUTH AFRICAN BIRTH COHORT**

Authors: Simone Rose Williams[1], Frances Robertson, Catherine J Wedderburn, Jessica Ringshaw, Layla Bradford, Nadia Hoffman, Shantanu Joshi, Heather J Zar, Dan J Stein*, Kirsten A Donald[1]*
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Introduction:
Since perinatal neurodevelopment forms the basis upon which optimal brain health and function are built, exposure to maternal HIV and/or antiretroviral therapy (ART) during *in utero* and/or early postnatal development may adversely affect functional brain development and subsequent neurological functioning. Regional brain metabolite alterations have previously been linked to HIV exposure in both young and older children and could therefore serve as a pathway governing impaired functional neurodevelopment. Our study compared regional brain metabolite concentrations in 6-year-old children who are HIV-exposed uninfected (CHEU) to children who are HIV-unexposed (CHU) and associations of potential neurometabolite patterns with Early Learning Outcome Measures (ELOM) scores.

Methodology:
A subset of 152 children enrolled in the DCHS had magnetic resonance spectroscopy data acquired at 6 years of age, 42 CHEU and 110 CHU. Absolute and relative brain metabolite concentrations were quantified from single voxels covering parietal grey matter (pgm) and right parietal white matter (pwm). Functional neurodevelopmental outcomes were also assessed at 6 years of age, using the ELOM. Neurometabolite concentrations between CHEU and CHU groups were compared using adjusted linear regression analysis. Underlying neurometabolic patterns based on MRS data were identified using factor analysis, and the relationship between neurometabolite patterns and HIV and/or ART exposure status was explored using logistic regression. Pearson correlation analysis was used to explore the relationship between neurometabolite patterns associated with HIV and/or ART exposure status, and ELOM subdomains in CHEU and CHU.

Results:
After quality control, we had 138 and 109 usable MR spectra for pgm (98 CHU, 40 CHEU, 53% male) and pwm (84 CHU, 25 CHEU, 55% male), respectively. CHEU were on average one month older than CHU, with age ranging from 69 to 81 months. All mothers of CHEU received ART. In pgm, both absolute and relative glutamate concentrations were significantly lower in CHEU compared to CHU, after adjusting for maternal alcohol use using pregnancy, child sex and child age at scan ($p = 0.046$ and $p = 0.035$ for absolute and relative glutamate respectively). Similarly, adjusted relative choline concentrations in pwm were also significantly lower in CHEU ($p = 0.039$). Factor analysis identified four underlying neurometabolite patterns from both relative and absolute MRS data. A pgm glutamate and myo-inositol dominated factor, identified from the relative MRS data, was associated with HIV and/or ART exposure status in unadjusted (OR 0.55, 95% CI 0.17 - 0.45, $p = 0.013$) and adjusted analyses (OR 0.59, 95% CI 0.35 - 0.94, $p = 0.031$). A significant correlation between the pgm glutamate and myo-inositol dominated factor associated with HIV exposure and ELOM gross motor development scores in CHEU ($r = -0.48$, $p= 0.044$). No significant associations were observed between this factor and ELOM gross motor development scores in CHU.

Discussion:
Reduced glutamate concentrations in parietal grey matter suggest regional alterations in excitatory glutamatergic transmission pathways in the context of perinatal HIV and/or ART exposure, while reduced choline concentrations in parietal white matter may suggest regional myelin loss. The identified association between the neurometabolite pattern associated with HIV exposure and gross motor development outcomes, provides an understanding of a potential pathway which may underlie adverse functional neurodevelopmental symptomology in CHEU.

Title: **PARTICIPATION IN EARLY LEARNING (0-5 YEARS): LEARNING FROM LOCAL COMMUNITIES TO INFORM EARLY CHILDHOOD DEVELOPMENT POLICY**

Authors: Malibongwe Gwele[1], Linda Biersteker[2] and Marsha Orgill[1]

Affiliation: [1]The Children's Institute, UCT, [2] ECD consultant for The Children's Institute, UCT

Introduction:
We explored the concepts of safety, inclusion and the participation of children (0-5 years) and their families in Early Childhood Development (specifically early learning opportunities) in one local community in Cape Town. We did this to understand how ECD policy is given practical expression on the ground. In this abstract we focus on how the participation of children and their families is enabled or disabled in ECD early learning settings. The National Child Participation Framework (NCPF) in South Africa defines child participation as 'the active involvement of children in the decisions, processes, programmes and policies that affect their lives'. Participation in early learning includes considering how adults who are teaching and/or providing caregiving for young children can support shared decision-making processes in which children are actively engaged. We sought to understand the contextual factors and local level interpretations of what participation is in practise and how it is understood as part of early learning for children aged 0-5. This study responds to an urgent research need within the South African context, to better understand how early learning can be improved and expanded for young children in line with local policy and global development goals. This part of the research paid attention to participation in learning environments where violence, inequality, and concentrated poverty is prevalent.

Methods:
The study is a qualitative community case study of a vulnerable local community in Cape Town. The study population were purposively selected to provide information on policies, systems and implementation of ECD in the local context, and to help us understand the practise of participation on the ground. Data collection included interviews and focus groups with advisory group committee members, ECD practitioners, ECD principals and parents or caregivers of children. Data was also collected using Persona Doll facilitation to facilitate discussion with children. This was supplemented by documentary and policy review. Data was analysed using thematic analysis and was triangulated across three researchers.

Findings:
We found that where children are in environments that feel safe and inclusive, they are more likely to become actively involved (participate), this is true in the home and in the ECD centre. Some early learning centres and non-centre-based activities do provide opportunities for children to participate in their own development, for example opportunities to be a class monitor. Generally, ECD centres are considered safe spaces where expression of feelings is encouraged. There are however barriers to participation such as diversity of language, adult's attitudes toward both children and teachers, and practitioners themselves not feeling confident in promoting participation by children. Broader issues include overcrowding in preschools, exposure to violence and general safety which can make it difficult for children to use their agency and participate fully at school, at home and in the community at large. While this is a challenge for many children it is particularly difficult for children with special needs. The participation by parents in early learning is driven by their own motivation and their understanding of their role in a child's early learning experience.

Conclusion:
The ability of children to express their agency and to participate is influenced by community level circumstance such as safety, language diversity and the need to pay fees to access centre based ECD. Within early learning spaces where children attend, participation is influenced by teacher attitudes, parent attitudes and the availability of opportunities and resources. We need to think more actively about working with actors on the ground to promote an understanding of participation and to intentionally create opportunities for parents and children to participate, including building on opportunities that already exist.

HREC REF: 737/2021

Title: **ENTEROVIRUS AND NON-ENTEROVIRUS VIRAL MENINGITIS IN CHILDREN ADMITTED AT A REGIONAL HOSPITAL IN CAPE TOWN, SOUTH AFRICA: A RETROSPECTIVE RECORD REVIEW**

Authors: Bokamoso Molale[1]*, Chanelle Pretorius[1]*, David M le Roux[2], Nei-yuan Hsiao[3], M Louise Cooke[2]
*(*Joint first author)*

Affiliation: [1]Faculty of Health Sciences, University of Cape Town; [2]Department of Paediatrics and Child Health, University of Cape Town; [3]Department of Medical Virology, University of Cape Town; and National Health Laboratory Services

Objective:
Viral meningitis is more common than bacterial meningitis in children; the enterovirus (EV) family are the most common causes of viral meningitis. Viral meningitis, and especially EV meningitis, is poorly recognised and under-diagnosed: bacterial and viral meningitis cannot be differentiated clinically, and interpreting cerebrospinal fluid (CSF) analysis is difficult as many proven EV meningitis cases have polymorphonuclear (PMN) cell predominance. For this reason, we wanted to characterise the clinical and laboratory features of EV and non-EV viral meningitis; describe the management and length of hospital stay of EV and non-EV viral meningitis; and whether timely EV polymerase chain reaction (PCR) investigation could influence management.

Methods:
A retrospective folder review of children admitted to paediatric wards of New Somerset Hospital between 1 June 2015 and 31 May 2019 was conducted. Children under age 13 years were eligible for inclusion if they if they were diagnosed with viral meningitis on discharge ICD10 code, and had CSF cell count available. Clinical information was retrieved from patient folders; an anonymous de-identified dataset was analysed. Confirmed EV meningitis cases (positive EV PCR on CSF) were compared to those with negative EV PCR, and to those in whom viral meningitis was diagnosed using CSF cell count and chemistry but who did not have EV PCR testing. Categorical data were analysed as percentages and compared with Chi-squared tests; continuous data were analysed as median (interquartile range (IQR)) and compared with Kruskal-Wallis equality of populations rank test.

Results:
Over the 4-year study period, 96 children were included; median age was 45 months (IQR 3 – 83 months). Age range was 7 days to 12 years; 6/96 (6%) were neonates (age <28 days); 28/96 (29%) were aged 1 month to 1 year. EV meningitis was confirmed in 22/96 (23%); 21/96 (22%) tested EV PCR negative; 53/96 (55%) did not have EV PCR testing done. Overall, CSF PMN cell counts were higher than lymphocyte counts in 28/96 (29%) of children, more frequently among children with positive EV PCR (15/21, 68%), and less frequently if EV PCR was negative (3/21, 14%) or EV PCR was not done (10/53, 19%). Children who did not have EV PCR done had similar CSF PMN counts (median 8/ul, IQR 2 – 20) to children whose EV PCR was negative (median 10/ul, IQR 1 – 25). Children with positive EV PCR had higher CSF PMN counts (median 77/ul, IQR 17 – 175, p=0.0002). CSF lymphocytes, red blood cells, protein and glucose were similar in all children.

A third-generation cephalosporin was given to 85 children (89%) for a median of 2 days (IQR 1 – 4). Median duration of hospitalization was 2.5 days (IQR 1 – 4.5); children who did not have EV PCR done had shorter hospitalization (median 1 day, IQR 1 – 3, p=0.0002). Twenty-five children (26%) were discharged within 1 day of admission. Turnaround time for EV PCR ranged from 0 to 12 days (median 4 days, IQR 2 – 5).

Conclusions:
Most children with typical viral meningitis (CSF PMN cells less than lymphocytes) did not receive EV PCR testing, had short antibiotic durations and short hospital stay. Most children with PMN predominance had positive EV PCR. Results of EV PCR need to be available more quickly if PCR is to influence clinical management decisions, reduce antibiotic use and shorten hospital stay.

Title: **SURFACTANT FOR THE TREATMENT OF RESPIRATORY DISTRESS SYNDROME IN VERY LOW BIRTH WEIGHT INFANTS AT A LEVEL 2 HOSPITAL: A DESCRIPTIVE RETROSPECTIVE COHORT STUDY – SAFETY AND EFFICACY**

Authors: Nxumalo, M[1]; Els-Goussard, I; Sprenger, K; Joolay, Y

Affiliation: [1]Department of Paediatrics and Child Health, University of Cape Town

Background and rationale:
Respiratory Distress Syndrome (RDS) is common in pre-term infants and is related to immaturity of the lungs. Surfactant therapy is now being widely used outside of tertiary neonatal centres. The purpose of this study is to describe the demographics and the incidence of adverse events in very low birth weight preterm infants with Respiratory Distress Syndrome (RDS) treated with surfactant at a regional Hospital in the Western Cape Province of South Africa.

Methods:
This was a retrospective observational study of infants treated with surfactant during the study period 2017 to 2019 at George Regional Hospital. We conducted an electronic folder review of infants with a birth weight of 800g to 1200g. Outborn infants and those with congenital abnormalities were excluded. A descriptive analysis of patient demographics and adverse outcomes was done on the Statistical Package for Social Sciences (SPSS).

Results:
The total number of participants included in the study were 66.The median birth weight was 965g (Interquartile range(IQR) 880-1060g) with a median gestational age of 28 weeks (IQR 28-29 weeks). The most common risk factor for pre-term delivery was pre-eclampsia (38/66; 57.7%), The majority of participants only required a single dose of surfactant (44/66; 66.7%). The median time to first dose of surfactant was 5 hours (IQR 2-16). The number of participants who were mechanically ventilated was 18/66; 27%. The median number of days on mechanical ventilation for the overall group was 0 days (IQR 0-2). The median total number of days on supplementary oxygen, including various methods of oxygen delivery was 9 days (IQR 4-29). The most common adverse outcomes were chronic lung disease (17/66; 25.8%) and Death (17/66; 25.8%). The incidence of pulmonary air leak was (2/66) 3% and pulmonary haemorrhage was (6/66) 9.1%.

Conclusion and recommendations:
Regional hospitals have limited capacity for ventilatory support of preterm newborns. This study showed that adverse outcomes in very preterm infants with RDS treated with surfactant at a regional Western Cape hospital were similar to outcomes published recently from a central hospital in South Africa. Further research should explore how the incidence of adverse events can be reduced in very low birth weight infants.

Title: **HYPERGLYCEMIA AND OUTCOME IN NEONATES WITH HYPOXIC ISHEMIC ENCEPHALOPATHY**

Authors: M Sichula† MBChB (Pret), FCPaed (SA); S Pillay† MBChB (UCT), DCH (SA), FCPaed (SA), MMEd Pead (UCT), Cert Neon (SA); V Naakibuka* MBCHB, MMEd Pead (MUK), MPhil Neon (UCT); MC Harrison† MB ChB, MRCP(UK), FRCPCH (UK); AR Horn†, MBChB (UCT), DCH (SA), FCPaed (SA), Cert Neon (SA), PhD (UCT)

Affiliation: †Neonatal Medicine, School of Child and Adolescent Health, University of Cape Town; ∗Department of Pediatrics, Nsambya Hospital, Kampala Uganda

Background:
Hypoxic ischemic encephalopathy (HIE) remains a leading cause of death and disability in term infants despite therapeutic hypothermia. Hyperglycemia in the first 12hours of life is associated with poor outcome in some studies. This relationship has not yet been explored in south African cohorts.

Objective:
The primary objective was to describe the association between hyperglycemia, in the first 12hours of life, and poor outcome defined as death or a severely abnormal amplitude integrated electroencephalogram (aEEG) at 48hours, in infants with moderate-severe HIE who were treated with hypothermia in a South African tertiary hospital.

Methods:
Folders from a database of 57 infants with moderate-severe HIE treated with hypothermia between January 2011 to December 2012, were reviewed to obtain glycemic profiles in the first 12hours of life. Hyperglycemia and hypoglycemia were defined as serum glucose > 8.3mmol/l and < 2.3 mmol/l respectively, to facilitate comparison with previous publications. Maternal and infant characteristics and outcomes were also extracted from the database.

Results:
Only 47 infants had adequate glucose and aEEG data. Seventeen infants (36%) had hyperglycemia, 25 infants (53%) were normoglycemic and 5 infants (10%) had hypoglycemia. None of the hypoglycaemic infants had hyperglycaemia or abnormal outcome and they were excluded from subsequent comparisons. Eighteen neonates had severely abnormal aEEG at 6 hours; 10 were hyperglycaemic and 8 were normoglycaemic. Six infants died: 5 (29%) in the hyperglycaemic group and 1 (4%) in the normoglycemic group. Thirteen neonates had the combined abnormal outcome of death or severely abnormal aEEG at 48 hours: 6 (35%) in the hyperglycaemic group and 7 (28%) in the normoglycemic group. Hyperglycemia was significantly associated with a lower 5-minute Apgar score (p=0.007), severely abnormal aEEG at 6hours (p=0.046), and a higher HIE score at 6hours (p=0.002). Hyperglycaemia was associated with death (Odds Ratio 10; 95%CI 1-96; p=0.036), but the association was not independent of the 5-minute Apgar score. Hyperglycaemia was only associated with death or severely abnormal aEEG at glucose value of ≥ 25.6 mmol/l.

Conclusion:
Early hyperglycemia was associated with disease severity at birth and poor outcome despite cooling.

ETHICS APPROVAL NUMBER: HREC 245/2020

Title: **SOCIO-ECONOMIC STATUS IS A DETERMINANT OF CHILDHOOD CANCER OUTCOMES IN SOUTH AFRICAN CHILDREN**

Authors: Marc Hendricks[1], Annibale Cois[2,3] Jennifer Geel[4], Jaques van Heerden[5,6], Kirsten A Donald[7], Mariana Kruger[5]

Affiliation: [1]Haematology Oncology Service, Department of Paediatrics and Child Health, Red Cross War Memorial Children's Hospital, University of Cape Town, Cape Town, South Africa; [2]Division of Health Systems and Public Health, Department of Global Health, Stellenbosch University, Cape Town, South Africa; [3]Division of Epidemiology and Biostatistics, School of Public Health and Family Medicine, University of Cape Town, Cape Town, South Africa; [4]Division of Paediatric Haematology Oncology, Department of Paediatrics and Child Health, Charlotte Maxeke Johannesburg Academic Hospital, University of Witwatersrand, Johannesburg, South Africa; [5]Paediatric Haematology Oncology, Department of Paediatrics and Child Health, Faculty of Medicine and Health Sciences, University of Stellenbosch, Tygerberg Hospital, Cape Town, South Africa; [6]Paediatric Haematology and Oncology, Department of Paediatrics and Child Health, University of Antwerp, Antwerp University Hospital, Antwerp, Belgium; [7]Division of Developmental Paediatrics, Department of Paediatrics and Child Health, Red Cross War Memorial Children's Hospital, and the Neuroscience Institute, University of Cape Town, Cape Town, South Africa.

Background and Aims:
Significantly discrepant survival rates have been documented in single disease childhood cancer cohorts in South Africa, in which those from higher socioeconomic groups were shown to have a significantly lower risk of death than those from less affluent households. This study aimed to determine the impact of socioeconomic status (SES) on survival of children with cancer using pooled South African data.

Methods:
Five databases spanning January 2000 to December 2021 were interrogated. SES status was assigned based on a public sector annual household income classification. H0 households (formally unemployed) received free healthcare. H1, H2 and H3 households paid relative to income. H3 households (highest income) earned more than R350,000 per year. The Spearman test was used to assess correlations between SES and disease stage at diagnosis. Hazard ratios were determined using Cox regression modelling. The Kaplan-Meier procedure was used to estimate overall survival (OS) (CI 95%).

Results:
Sixteen-hundred patients were eligible for analysis while 1,269 solid tumour patients were compared for SES category and stage. There was a negative correlation between SES and stage (Spearman rho= -0.178; $p<0.001$). Patients with solid tumours and lower SES showed proportionately higher numbers of stage III and IV disease ($p<0.01$). This proportion decreased with higher SES categories. In the multivariate analyses adjusted for sex, age, tumour type and stage, higher SES was associated with a lower risk of death ($p<0.001$), indicating that the impact of SES on survival was in excess of any effect that could be explained by lower stage disease alone. Five-year OS was 85.3% in children from H3 households versus 47.7% in children from H0 households ($p<0.001$).

Conclusion:
SES significantly impacts cancer survival in South African children. Advocacy to increase social support for the poor is essential if we are to achieve equitable improvements in childhood cancer outcomes with standardised national protocols.

Title: **"*MOMMY, HE USED TO HIT YOU, WHY DID YOU HIT US?":* UNPACKING THE INTERSECTIONS OF VAC AND VAW IN TWO SOUTH AFRICAN COMMUNITIES**

Authors: Shanaaz Mathews, Lauren October, Aislinn Delany, and Kerryn Rehse

Affiliation: The Children's Institute, University of Cape Town

Background:
Violence against women (VAW) and violence against children (VAC) are endemic in South Africa, affecting large numbers of women and children. Globally there has been increasing recognition that these forms of violence are linked but evidence on the nature and consequences of VAC and VAW and its relationship across the life course is limited in the Global South.

Objectives:
This paper aims to examine community perceptions of VAW and VAC, the social norms that underpin these forms of violence, and how families commonly experience these intersecting forms of violence.

Methods:
Purposive sampling was used to identify 20 stakeholders for individual interviews (IDI), and four focus group discussions (FGDs) with adult men, women, and young people (female and male) aged 15-18 years, in two communities in the Western Cape South Africa. FGDs were structured around case vignettes depicting intersecting IPV and VAC in the home. FGDs with young people included participatory techniques to facilitate more candid participation. Interviews and focus group discussions were conducted between December 2020 and April 2021. A framework analysis approach was used to analyse the data using NVIVO software for data coding.

Results:
VAC and VAW were considered by all as part of township life. No single risk factor stands out but a web of interrelated factors contributed to an increased risk for VAC and VAW, including perpetration of violence in the home. Men, women, and young people describe pathways for men to take on violent masculinities and women's risk to be a victim of violence in the home as starting early. Based on participants experiences we show how social norms regarding gender and power coalesce in the family and drive both forms of violence. Power, control and oppression also shapes the relationship between parents and children with harsh and punitive forms of parenting the norm. This provides the space for experiences of sexual abuse and other forms of violence to remain hidden. Importantly, violence in the home is still considered "private" and affects how families and communities respond.

Conclusion:
Understanding the dynamic interplay between VAC and VAW is important to inform the development of interventions that can shift the pattern of these forms of violence in Global South contexts.

Ethics approval number: HREC REF: 466/ 2020

Title: **PARENTAL PERCEPTIONS OF THE EDUCATIONAL NEEDS OF CHILDREN WITH GENETIC CONDITIONS LEADING TO INTELLECTUAL DISABILITIES**

Presenting Author: Sinead Cameron-Mackintosh[1]; Primary Supervisor: A/Prof Tina-Marié Wessels, Co-Supervisor: Kalinka Popel

Affiliation: [1]Department of Pathology, University of Cape Town

In South Africa, over 210 000 students have one or more disabilities, and only roughly 513 government schools are equipped to support children with these disabilities. These schools include mainstream and designated special needs schools (SNS). Thus, there are limited schooling choices (government or private mainstream school/SNS or home-schooling) for parents and caregivers of children with disabilities. Little is known about the difficulties parents and their children with genetic conditions that lead to intellectual disability face. These children often have multiple challenges resulting in their varying special schooling needs.

This qualitative study aimed to explore the parent's perceptions of their child's needs regarding their special needs school. Potential participants were identified from the genetics clinic database at Red Cross War Memorial Hospital in Cape Town (RCWMH). Nine participants were interviewed using a semi-structured interviewing method, conducted telephonically or via an online platform (Zoom) (In-person interviews were not possible due to COVID-19 restrictions). Interviews were recorded and transcribed using Descript software. The data was then analysed using thematic analysis.

Recruitment and interviews took place from 19 May 2021 to 10 September 2021. Three themes emerged from the data: 1) Child and Family, 2) The School Journey, and 3) The School's Operations. The children have their own health challenges that impact those around them, such as their immediate and extended family. Participants highlighted that when the family did not understand the condition, they were less likely to support and help care for the child. Finding a school and, more importantly, finding the right school for their child was difficult for most participants as they faced hurdles such as long waiting lists, mixed-ability classes and expensive school fees. Participants complimented certain aspects of the school's operations, such as parent support group meetings.

On the other hand, complaints included poor communication from the school. The participants also recommended changes they would like to see at the schools, such as outdoor activities and sports for the children. The results showed key areas where parents need help and support. There are several areas where genetic counsellors could play a role in supporting these families. These include facilitating family communication, appropriate referrals and advocacy.

This research could help with more efficient school placement of children with a genetic condition leading to intellectual disability, especially those with more than one disability or health challenge. Understanding what parents and families with children at special needs schools endure may help healthcare and educational professionals provide support and assist them with the child's educational needs. This research could also assist special needs schools in addressing parents' concerns and identifying what methods and processes parents find beneficial. This study identified further opportunities for future research, such as research into the roles and limitations of genetic counselling in special needs education and family communication.

Title: **THE NURSES' ROLE IN PREVENTING PRESSURE INJURIES FOR CHILDREN IMMOBILISED WHILE VENTILATED: MODIFICATION AND DEVELOPMENT OF A CONTEXTUALISED EVIDENCE-BASED PRACTICE**

Presenting Author: Lucy Dapaah

Affiliation: Harry Crossley Children's Nursing Development Unit (HCCNDU) / Division of Nursing & Midwifery, Department of Health and Rehabilitation Sciences, University of Cape Town

Purpose:
To develop a contextualised and modified Evidence-Based Practice Guideline (EBPG) that focuses on preventing pressure injuries for children immobilised while ventilated in a lower-resourced hospital setting while also providing excellent evidence-based nursing care.

Objectives:
To identify existing EBPGs from settings with higher resources and to use a rigorous and transparent process of modification and contextualisation to develop an EBPG of the best quality suitable for use in Ghana's Paediatric Intensive Care Unit (PICU). To ensure that the resulting EBPG explicitly recognised the nurses' expected active participation in preventing pressure injuries for children immobilised while ventilated as well as maintaining skin integrity.

Methods:
Identification of existing EBPGs relevant to the topic of concern searched was defined as population and intervention. A search of bibliographic databases, an online guidelines portal, and a Google Scholar search yielded clinical practice guidelines. Expert consultation was conducted to find gaps and get views on the recommendations that were relevant. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart was used to filter the EBPGs into two groups. The domains of the International Centre for Allied Health Evidence (iCAHE) were used for the appraisal of the guidelines.

Results:
The iCAHE Guideline Quality checklist was used to assess the quality of the guidelines identified. It is a tool comprising 6 domains; availability, dates, underlying evidence, guideline developers, guideline purpose and users and ease of dates with a total of 14 questions. The ICAHE is suitable for use in this case because it was a single researcher who appraised these clinical guidelines. After the screening, 2 guidelines were included: Royal Children's Hospital Melbourne, 2019, Pressure injury prevention and management and Butler C. T., 2007, Guideline for Assessment, Prevention and Treatment. The Royal Children's Hospital Melbourne (2019) guideline scored the highest (12) after appraisal. Butler C. T., 2007, Guideline for Assessment, Prevention and Treatment was excluded because it had the lowest score (10) since its anticipated date for review could not be found. The included guideline was specific to higher-resourced settings in Australia. The modification approach involves adoption, adaptation and contextualisation. The evaluated EPBGs were modified, under these themes: pressure risk injury and skin assessments, surface support, moisture control and skin care, prevention of shears and friction, mobility and positioning, nutrition and hydration, medical devices and family education. A flowchart was developed to highlight key steps in the process. The final EBPG was clinically sound, of excellent quality, comprehensible, and well-presented due to expert consultation.

Conclusion:
The process resulted in contextually-relevant adapted EBPG to guide nurses in preventing pressure injuries for children immobilised while ventilated in PICU of a lower-resourced setting to promote the quality of nursing care. Reducing pressure injuries for immobilised ventilated children maintains skin integrity, and prevents physical scarring and related psychosocial or financial burdens. As a result, nurses should prioritise pressure injury prevention in their daily care plans.

Statement of contributions: LD undertook all aspects of the work together following UCT's guidance supervised by Natasha North. Beatrix Callard provided guidance with flow diagram. Expert consultations were done by Professor Andrew Argent and Ms Heide Kunzmann.

Title: **NURSES' ROLE IN MONITORING AND TARGETING OXYGEN SATURATION LEVELS IN PRETERM NEONATES**

Presenting Author: Chisomo Kasitomu

Affiliation: Harry Crossley Children's Nursing Development Unit (HCCNDU) / Division of Nursing & Midwifery, Department of Health and Rehabilitation Sciences, University of Cape Town

Background:
Hypoxia contributes to over a million preventable deaths in low resource settings annually. Oxygen therapy is one of the most common therapies used in preterm neonates due to their immature respiratory drive. Pulse oximetry detects hypoxia, hyperoxia and allows titration of oxygen saturation to target levels. Globally implementation of guidelines on oxygen saturation targets in preterm neonates reduces complications.

Purpose:
To develop a contextualised and adapted evidence based practice guideline to enable nurses to prevent hypoxia and avoid hyperoxia in preterm neonates on oxygen therapy via nasal prongs.

Method and process:
Three-tiered process of guideline adaptation involving compilation of the evidence base, obtaining expert input and developing end user guidance documents was followed.
A structured, transparent and replicable search was conducted to identify existing clinical guidelines in Google and PubMed. Search terms were "monitoring" "oxygen saturation levels /targets" "preterm neonate/newborn" "nasal prongs/cannula". Seven eligible clinical guidelines were critically appraised for credibility and evidence using the International Centre for Allied Health Evidence (iCAHE).

Results:
Two guidelines were identified: The Royal Children's Hospital Melbourne (2020): Oxygen saturation SpO_2 level targeting in neonates and World Health Organization (2016): Oxygen Therapy for children.
A list of adapted and contextualised recommendations was developed. Finally a flowchart was developed visually representing the recommendations regarding monitoring and targeting oxygen saturation levels in preterm neonates on nasal prong oxygen therapy.

Conclusions: Guideline highlighted that continuous pulse oximetry must be used to confirm hypoxia/along with patient assessment in preterm neonates and Preterm neonates oxygen saturation target levels should be >90- 95%. Ethical approval was not required because the project modified and adapted published guidelines.

Statement of contribution: CK undertook the all aspects of the work according to UCT guidance, supervised by Natasha North. Beatrix Callard provided useful guidance with flowchart development. Dr Tiyamike Kapalamula and Dr Kondwani Kawaza and Mtisunge Malikebu assisted with co-appraisal of guidelines.

Title: **CLINICAL CHARACTERISATION AND EARLY OUTCOMES OF CHILDREN AND ADOLESCENTS WITH DISORDERS OF SEX DEVELOPMENT IN A TERTIARY CENTRE OF THE WESTERN CAPE IN SOUTH AFRICA**

Authors: Ewuraa Abena Owusuaa Manu[1], Ariane Spitaels[1,2], Ian Ross[3], Michelle Carrihill[1,2]

Affiliation: [1]Paediatric Endocrine Service, Red Cross Hospital, Groote Schuur Hospital; [2]Department of Paediatrics and Child Health. University of Cape Town; [3]Division of Endocrinology Department of Medicine University of Cape Town

Background:
There is a wide range in the prevalence of the various aetiologies of Disorders of Sex Development (DSD) in the various studies performed in Africa. The objective of this study was to describe the spectrum of DSD cases seen at the paediatric and adolescent endocrine service at the Red Cross War Memorial Children's Hospital (RCWMCH) and Groote Schuur Hospital (GSH), Cape Town, South Africa, categorize their outcomes and correlate the biochemical, molecular and cytogenetic findings with their clinical characteristics.

Methods:
This was a retrospective review of all the DSD cases referred to the endocrine unit of RCWMCH and GSH from January 2006 to December 2021.

Results:
These are the preliminary findings. A total of 160 folders were reviewed and 9 folders were excluded. A total of 151 folders were analysed.
The overall median age at the first visit was 8 months (IQR: 2 months-3 years) with an average age of 28 months. Sixty-eight out of 151 (45%) were referred as ambiguous or atypical genitalia. Most of the cases, 134 (88.7%) had been assigned gender by parents/ relatives prior to being reviewed at the endocrine unit, of which the majority 93 (61.6%) were assigned the male sex. Based on the current Lawson Wilkins Paediatric Endocrine Society (LWPES) and European Society for Paediatric Endocrinology (ESPE) classification the diagnostic categories; 46 XY DSD in 70/139 (50.3%), 46 XX DSD in 46/139 (33%) and, Sex Chromosomes DSD in 23/139 (16.5%). The adjusted testosterone level across the different diagnostic categories were not statistically significant. The most common diagnoses after investigations in descending order are; disorders of androgen synthesis or action or idiopathic 38/150 (25%), 46, XX Ovotesticular DSD 26/150 (17.3%), Congenital Adrenal Hyperplasia 16/150 (10.7%) and, Turners syndrome 16/150 (10.7%). The majority 96/151 (63.5%) were still being reviewed or had a written plan for endocrine follow-up at time of puberty. The rest had been lost to follow-up.

Conclusion:
There is a wide spectrum of DSDs in South Africa. With improvement in the diagnosis and awareness, majority are enrolled in a paediatric endocrine service. The difference in adjusted testosterone levels was not statistically significant across the various genders.Disorders of androgen synthesis or action continue to be the most common among the DSDs followed by 46 XX Ovotesticular DSD.

Title: **NEUROIMAGING FOR CHILDREN WITH NEURODEVELOPMENTAL DISORDERS (NDDs) IN THE AFRICAN POPULATION; DOES IT ADD ANY VALUE TOWARDS THEIR MANAGEMENT?**

Authors: Aleya Remtulla[1], Emma Eastman[1], Deepika Goolab[1], Este Sauerman[1], Raphaela Itzikowitz[1], Brigitte Melly[1], Charles Newton[2], Amina Abubakar[2], Elise Robinson[3], Kirsten A Donald[1]

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Introduction/Objective:
Neuroimaging (NI) for Neurodevelopmental disorders (NDDs), especially in areas with high infection rates, prevalent in malnutrition and inadequate neonatal care, remains a scarce resource. The value of expensive NI investigations in the work-up of NDDs in low and middle income countries (LMIC) is unknown. We investigated the spectrum of NI findings in a clinical population of children with NDDs in South Africa. The main objective of this research is to identify what role NI has contributed to understanding the profile, etiology and management of NDDs in a clinical population.

Methods:
This study was embedded in the South African arm of the NeuroDev study, a project exploring genetic variation amongst children with NDDs in African populations. Clinical information regarding etiology, management and NI findings were collected from records of children (cases only) attending a tertiary developmental clinic over the period of three years (August 2018-August 2021). The NI information was collected as part of standard clinical protocols. These were categorized according to the most common imaging patterns reported as well as the affected regions of the brain. Data was collected onto the REDCap database and presentation was stratified by the NDD diagnostic category and the respective descriptive statistics reported (HREC REF 199/2022)

Results:
One hundred and fifteen children (17.8% of the total 647 participants) had NI studies as part of their clinical work-up and were included in this embedded analysis. The median age of participants was 5 years (range 2-13years). Seventy-four children (64%) were males and 41 (36%) were females. Of the total number of scans, 43 (37.2%) were Magnetic Resonance Imaging (MRI), 37(32.2%) Computerised Tomography (CT) and 35 (30.4%) included both. There were 31 (27%) abnormal MRIs and 22 (19%) abnormal CT scans reported. The most common abnormalities were ventricle/skull anomalies on CT scans and abnormal cerebral white matter (including corpus callosum abnormalities) on MRI.

Conclusion:
The preliminary results reveal that for this group of children with NDDs who had NI as part of their clinical care, non-specific abnormalities of cerebral white matter (especially corpus callosum) on brain MRI was the most common pattern. Although several studies link such non-specific white matter anomalies to an array of NDDs, the exact aetiology remains unidentified for >50% of the cases (1)(2)(3). While the findings in our study followed this pattern as well, abnormal findings as described above suggest that NI may be of value in understanding underlying regions of the brain implicated or particularly vulnerable to processes resulting in functional developmental disorders.

Title: **TRANSVERSE MYELITIS AS A PRESENTING FEATURE OF SYSTEMIC LUPUS ERYTHEMATOSUS: A CASE REPORT**

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Introduction:
Lupus myelitis is a rare but disastrous complication of systemic lupus erythematosus (SLE). Neurological manifestations are reported in up to 60% of patients with SLE, however these most commonly include stroke syndromes, seizures, and peripheral neuropathy. Only 1-2% of patients with SLE develop lupus myelitis, and it can be complete or partial. It may present as a combination of both motor and sensory deficits.

Methods:
We present an 11-year-old African girl who was referred with a suspected diagnosis of dermatomyositis or vasculitis. She presented with a 3-week history of swelling of her lower limbs, followed by weakness and paralysis. This was accompanied by auditory and visual hallucinations. She was wasted and hypertensive. She had vasculitis of her toes, dry gangrenous black fingers, and polymyoclonus of fingers. She had flaccid paralysis in lower limbs below lumbar region (L1) with loss of bladder and bowel sphincter control. Eye examination revealed bilateral peripapillary cotton wool exudates.

Results:
A laboratory panel of investigations revealed clear evidence of systemic lupus erythematosus and renal impairment. Echocardiography showed vegetation or thrombus on the mitral valve.MRI brain and spine showed an expansile intramedullary lesion involving the distal thoracic cord and conus medullaris with minimal enhancement. CT angiography showed no vasculitis but multiple small bilateral renal infarctions and multiple prominent lymph nodes. Malignancy was excluded from bone marrow histology. A lymph node biopsy revealed a reactive lymph node. The kidney biopsy showed features of focal segmental glomerulonephritis (lupus nephritis Class III-ISN/RPS 2004) and hypertensive vasculopathy. She was treated with methylprednisolone pulse therapy, intravenous immunoglobulin, and cyclophosphamide. She underwent amputation of her left four fingers. A multidisciplinary team was involved unfortunately she was lost to follow-up.

Conclusion:
This is the first case of transverse myelitis secondary to systemic lupus erythematosus in our setting. Clinicians should have a low threshold to investigate lupus myelitis in an unusual presentation of flaccid paralysis.

Keywords: Lupus Myelitis, Systemic Lupus Erythematosus, mitral valve thrombus

Title: **THE NURSE'S ROLE IN THE MANAGEMENT OF HOSPITALISED CHILDREN WITH A PERIPHERAL INTRAVENOUS CATHETER TO PREVENT ASSOCIATED INJURIES**

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Background:
The use of a peripheral intravenous catheter in hospitalised children is common and necessary for treatment. Management of this device is important for patient safety and device outcomes, however variations in the practice and management of this device have been observed in a less resourced setting in Namibia.

Objectives:
The purpose of this poster presentation is to report on the development of a contextualised and adapted standard evidence-based guideline for nurses managing hospitalised children with a peripheral intravenous catheter to prevent associated injuries.

Methods:
A structured, transparent and replicable search (PubMed, CINAHL, guideline portals and internet) was conducted to identify existing guidelines relating to the selected topic. Selected guidelines were screened for eligibility and appraised using the iCAHE: International Center for Allied Health Evidence tool to assess quality. The process recommended by the South African Guideline Excellence project for guideline modification was followed. A list of modified recommendations was developed considering the legal, regulatory frameworks and context for nursing in Namibia. A step-by-step flowchart of recommendations was developed as a concise and easy to understand tool.

Results:
Three hundred and seventy-four sources were screened and four were eligible and selected for appraisal. One guideline and one care bundle were identified suitable for modification. Peer and expert consultation were carried out to obtain local consensus and ensure inclusive evidence-based standards and recommendations. Further consultation was carried out to ensure the end-user flow chart was easy to follow.

Conclusion:
The process led to the development of a modified evidence-based guideline for nurses working with hospitalised children with a peripheral intravenous catheter in a setting with high patient turn-over and limited resources in Namibia.

Statement of contributions: BS undertook all aspects of the work together following UCT's guidance supervised by Natasha North. Minette Coetzee and Beatrix Callard provided guidance with the flow diagram. Expert consultations were provided by Ilana Webber and Ester Ambuda.