



28 SEPTEMBER 2023

SCHOOL OF CLINICAL MEDICINE

BIENNIAL RESEARCH DAY PROGRAMME & ABSTRACT BOOK

KEYNOTE SPEAKERS • ORAL PRESENTATIONS • POSTER SESSIONS

UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG



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Message from Prof Daynia Ballot, SOCM Head of School



Dear Colleagues,

It gives me a great pride and pleasure to welcome you to our School of Clinical Medicine Research Day 2023, where we showcase our Research Achievements. This year we have 36 Oral presentations and 27 Posters. Thank you to all our researchers for their contributions.

A special thanks to Prof Thandrayen and her organising committee, as well as to the scientific committee for all the time and effort in reviewing submissions. Thank you to our keynote speakers – your participation really elevates the status of our event.

I trust that the presentations today will inspire our emerging researchers to even greater achievements.

I hope you will enjoy the day with us.

Kind regards,

A handwritten signature in black ink, appearing to read 'D. Ballot'.

Professor Daynia Ballot
Head of School: Clinical Medicine
Faculty of Health Sciences
University of the Witwatersrand

ORGANISING COMMITTEE

- Prof Kebashni Thandrayen | 2023 SOCM Research Day Chairperson
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- Dr Doyin Ojifinni
- Prof Joanne Potterton
- Mr Scott Smalley

ACKNOWLEDGEMENTS

- All our Invited Speakers, Session Chairs & Adjudicators.
- All the oral and poster presenters for their innovative and high standard of research
- Conference Partner, in particular Tanya Schmidt (tanya@confpartner.co.za), Robin Bryan, Kristy Muller, Kim Upton.
- Audio Visual, Parking, Protection Services, Cleaning Services.
- Our sponsors for contributions to the research prizes (listed at the end of our booklet)
- Finally, the SOCM 2023 organising and scientific committee, for your dedication and hard work for a successful research day, inclusive of Rita Kruger for all her assistance

PRIZES: BEST ORAL AND POSTER PRESENTATIONS**1. BEST ORAL PRESENTERS** (first and second prize) in each category:

- (1) Undergraduate student/Honours student/Intern/Medical Officer
- (2) MMed/Registrar
- (3) MSc/Medical Scientist/Researcher / Lecturer
- (4) PhD/Postdoctoral Fellow/Senior Academic staff/Consultant

2. BEST POSTER PRESENTERS (first and second prize) in each category:

- (1) Undergraduate student/Honours student/Intern/Medical Officer
- (2) MMed/Registrar
- (3) MSc/Medical Scientist/Researcher/ Lecturer
- (4) PhD/ Postdoctoral Fellow/Senior Academic staff/Consultant

CPD

The meeting has been CPD accredited by the WITS Health Consortium:
1 Point per Hour, 2 points per presenter = 7 Points.

Prof Shane Norris

Shane Norris is a Professor of Global Health at the University of Southampton (UK) and Research Professor within the Department of Paediatrics at the University of the Witwatersrand, Johannesburg. Shane is the Director of the South African Medical Research Council's Developmental Pathways for Health Research Unit (DPHRU). He is the President of the Africa Chapter of the International Society of Developmental Origins of Health and Disease. Shane is also a professorial fellow at the Global Health Research Institute at the University of Southampton. Shane's research focuses on lifecourse epidemiology with a specific interest in the development of intergenerational-risk for obesity and diabetes. His expertise includes nutrition and body composition across the lifecourse and longitudinal-cohort study methodologies. Shane is working with several scientists across Africa to both better understand and develop interventions that improve maternal and child health outcomes.

[*Presenting an Opening Plenary Lecture: Building a Clinical Research Unit*](#)

Prof Sanjay Lala

Associate Professor Sanjay Lala, a paediatrician and paediatric gastroenterologist, is currently working in the Learning and Teaching Office in the Faculty of Health Sciences at Wits University. He was formerly head of a Clinical Unit at the Chris Hani Baragwanath Academic Hospital. Sanjay has been in clinical practice for over thirty years, having worked in a wide array of public health care settings in South Africa and England (where he completed his doctoral studies at University College London as a Nelson Mandela Scholar). His past and present research interests/areas include inflammatory bowel disease, childhood infectious disease (especially childhood TB and Group B streptococcal disease), and paediatric educational research.

He has been the convenor for the national South African paediatric fellowship (Part II FCPaed) written MCQ exams since its introduction in 2018, and is the recipient of the Vice Chancellor's Team-Teaching Award and Phillip V Tobias and Convocation Distinguished Team Teachers' Award.

[*Presenting an Opening Plenary Lecture: Nurturing clinician scientists at Wits University*](#)

Dr Mantoa Mokhachane

Dr Mantoa Mokhachane (MBBCh, FCPaeds, MMed Paeds, PGDip-Health Science Education, PhD Candidate in Health Science Education). Director of the Unit of Undergraduate Medical Education at the University of Witwatersrand, Johannesburg since 2015

She worked as a neonatologist at the Chris Hani Baragwanath Hospital Neonatal Unit for 18 years prior to branching into Medical Education. Her interest in medical education is social justice and employing an African lens, Ubuntu, in Professional Identity Formation, through her current doctoral work in a paper titled "Rethinking Professional Identity Formation amidst protests and social upheaval: A journey in Africa". Her work encompasses, neonatology, research ethics, highlighting issues of epistemic violence. She has been invited locally and internationally to speak and teach around these issues. She is a Steering Committee Member of the International Network in Kangaroo Mother Care (INK),

the Human Research Ethics Committee at the University of Witwatersrand and SAMRC Bioethics Advisory Panel.

[*Presenting in Session 3: Professional Identity: The role of Letsema in its formation | Session 3: Ubuntu Inspired Revival: Fostering Positive Professionalism at Wits Medical School*](#)

Prof Jonathan Levin



Prof Jonathan Levin is currently Professor of Biostatistics in the Division of Epidemiology and Biostatistics in the School of Public

Health at the University of Witwatersrand, having joined the School full time in April 2015. Previously he taught part time on the MSc Biostatistics module, from the beginning of the MSc in Epidemiology in 2000. His main duties relate to teaching on the MSc in Epidemiology and Biostatistics and supervising postgraduate students. He also teaches on a number of Biostatistics Courses for the Health Sciences Research Office. His research interests are in Clinical trials and the analysis of clustered data, including Cluster Randomized Trials and the secondary analysis of multistage survey data

[*Presenting in Session 6: Statistical significance vs clinical significance*](#)

Prof Derick Raal



Frederick J. Raal, MBBCh (cum laude), FRCP, FRCPC, FCP(SA), Cert Endo, MMED, PhD, DSC. Director, Carbohydrate and Lipid Metabolism Research Unit, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

Professor Derick Raal is a Distinguished Professor and Director of the Carbohydrate and Lipid Metabolism Research Unit, Faculty of Health Sciences, at the University of the Witwatersrand. After obtaining his MBBCh degree cum laude in 1981, he obtained his Master of Medicine in 1991, his PhD in 2000 and his Doctor of Science in 2022. He has received numerous postgraduate awards including the TH Bothwell Research Prize, the FJ Milne award, and the Vice Chancellor's Research Award. He is a NRF A-rated scientist, is recognized as a Web of Science highly cited researcher, and has authored or co-authored over 350 original articles and book chapters. He is particularly interested in lipid disorders and has been integrally involved in the management of familial hypercholesterolaemia (FH). The major focus of his research remains the clinical, biochemical, genetic and

therapeutic management of this condition and he continues to conduct studies with novel therapies such as ANGPTL3-inhibitors in this patient group.

[*Presenting in Session 7: Familial hypercholesterolaemia – from a lethal disorder in childhood to a manageable dyslipidaemia today*](#)

WELCOME AND OPENING PLENARY SESSION VENUE: Len Miller CHAIRPERSON: Prof Maria Papathanasopoulos					
08:00 - 08:10	Welcome Remarks by Prof Daynia Ballot, SOCM Head of School				
08:10 - 08:30	INVITED SPEAKER TITLE: Building a Clinical Research Unit Prof Shane Norris, University of the Witwatersrand (South Africa)				
08:30 - 08:50	INVITED SPEAKER TITLE: Nurturing clinician scientists at Wits University Prof Sanjay Lala, University of the Witwatersrand (South Africa)				
ORAL SESSION 1A PAEDIATRICS & CHILD HEALTH			ORAL SESSION 1B INTERNAL MEDICINE / OPHTHALMOLOGY		
VENUE: LEN MILLER CHAIRPERSONS: Prof Ashraf Coovadia and Dr Coceka Mnyani			VENUE: SURGICAL SKILLS CHAIRPERSONS: Dr Camira Pillay and Prof Graham Paget		
08:55-09:05	Association between tobacco exposure, blood pressure, and arterial stiffness in South African adults and children Ms Betty Nembulu	SOCM1A-01	08:55-09:05	Comparison of non-invasive diagnostic modalities for ocular surface squamous neoplasia at a tertiary hospital Dr Roland Hollhumer	SOCM1B-01
09:05-09:15	Optimising blood culture collection techniques to minimize contamination rates in a Public Sector Paediatric Department Dr Lucy Wilson	SOCM1A-02	09:05-09:15	The Histone deacetylase inhibitor SAHA (Vorinostat™) modulates metastatic properties of DLD-1 colorectal adenocarcinoma cells Mr Carlo Berrino	SOCM1B-02
09:15-09:25	Multi-drug resistant bacterial infections among very low birthweight infants with late-onset sepsis Prof Daynia Ballot	SOCM1A-03	09:15-09:25	The association of FGFR2 expression and splice isoforms with breast cancer subtypes Dr Caroline Dickens	SOCM1B-03
09:25-09:35	Admission hypothermia in very low birth weight newborns at Charlotte Maxeke Johannesburg Academic Hospital Dr Angidi Mauree	SOCM1A-04	09:25-09:35	Proteomic analyses of Huh-7 cells transfected with subgenotype A1, with and without the G1862T mutation Ms Kiyasha Padarath	SOCM1B-04
09:35-09:45	Whole genome sequencing and molecular surveillance of influenza in South African children Ms Jeanine Du Plessis	SOCM1A-05	09:35-09:45	Resveratrol impact on survival of Candida species and how it combats Candida albicans virulence properties Ms Carla Hattingh	SOCM1B-05
09:45-09:55	The biochemical and radiological profile of genetic hypophosphatemic rickets and the response to conventional treatment Dr Nikhila Isaac	SOCM1A-06	09:45-09:55	COVID-19: An evaluation of predictive scoring systems in South Africa Dr Brent Prim	SOCM1B-06
10:00-10:15	REFRESHMENT BREAK				
ORAL SESSION 2A PAEDIATRICS & CHILD HEALTH			ORAL SESSION 2B GENERAL SURGERY		
VENUE: LEN MILLER CHAIRPERSONS: Mr Emmanuel Korsah and Prof Ziyaad Dangor			VENUE: SURGICAL SKILLS CHAIRPERSONS: Dr Theshni Govender and Prof Jerome Loveland		
10:15-10:25	Epstein Barr virus risk stratification to predict post-transplant lymphoproliferative disorder in paediatric liver transplant recipients Dr Priya Walabh	SOCM2A-01	10:15-10:25	Overview of endocrine hypertension treated in surgery at Chris Hani Baragwanath Academic Hospital Prof Ifongo Bombil	SOCM2B-01
10:25-10:35	The impact of HIV status on the outcome of paediatric intensive care unit admissions Dr Kim Whitehead	SOCM2A-02	10:25-10:35	A retrospective analysis of outcomes and complications of living and deceased donor split liver transplantation in Johannesburg, South Africa Dr Richard Crawford	SOCM2B-02

10:35-10:45	Ventilatory support and surfactant use in extremely low birth weight infants over a decade, Johannesburg Dr Minah Mavunda	SOCM2A-03	10:35-10:45	A 3D-printed artificial non-stoichiometric interpolyelectrolyte complex for tissue restoration and regeneration after liver trauma Ms Kate Da Silva	SOCM2B-03
10:45-10:55	Introduction of dolutegravir and the early viral response seen in South African children and adolescents Dr Tshiamo Mafora	SOCM2A-04	10:45-10:55	Spectrum of thoracic ascending aortic aneurysms at a peri-urban tertiary hospital Prof Ruchika Meel	SOCM2B-04
10:55-11:05	The burden of poisoning in children hospitalized at a tertiary-level hospital in South Africa Dr Mahtaab Khan	SOCM2A-05	10:55-11:05	Validation of the usefulness of risk scoring systems for predicting mortality in upper gastrointestinal bleeding Ms Alexia Pullinger	SOCM2B-05
11:05-11:15	Care for the caregiver, how caregiver mortality affects treatment outcomes – an observational cohort study Dr Josephine Keal	SOCM2A-06	11:05-11:15		
SESSION 3 INVITED SPEAKER VENUE: LEN MILLER CHAIRPERSON: Prof Kebashni Thandrayen					
11:20-12:00	Professional Identity: The role of Letsema in its formation Dr Mantoa Mokhachane, University of the Witwatersrand (South Africa)				
12:00-12:40	Ubuntu Inspired Revival: Fostering Positive Professionalism at Wits Medical School Dr Mantoa Mokhachane, Dr Argentina Ingratta, Dr Leonard Muhango and Prof Richard Cooke, University of the Witwatersrand (South Africa)				
12:45-13:30	LUNCH				
ORAL SESSION 4A SURGERY, FAMILY MEDICINE, PSYCHIATRY & NEUROSCIENCES			ORAL SESSION 4B SURGERY, ORTHOPAEDIC SURGERY, OPHTHALMOLOGY AND RADIOLOGY		
VENUE: LEN MILLER CHAIRPERSONS: Dr Evelyn Lumngwena and Dr Kobus Scheepers			VENUE: SURGICAL SKILLS CHAIRPERSONS: Prof Palesa Motshabi and Ms Aviwe Mgobozi		
13:30-13:40	Menstrual hygiene management in schools in South Africa: Knowledge, experience and impact on school attendance Ms Bongiwe Zulu	SOCM4A-01	13:30-13:40	The microbiology and resistance profiles of diabetic foot sepsis at Charlotte Maxeke Johannesburg Academic Hospital Ms Simran Patel	SOCM4B-01
13:40-13:50	Characteristics of women initiated on opioid substitution therapy at primary healthcare level in Tshwane Ms Daniela Sefora Goeieman	SOCM4A-02	13:40-13:50	Life expectancy following amputation for diabetic foot sepsis at a regional hospital Dr Thoriso Mokoala	SOCM4B-02
13:50-14:00	Population incidence of presumed community-acquired-pneumonia in South African adults across three hospitals: A spatial distribution Ms Taile Portia Kgoete	SOCM4A-03	13:50-14:00	A review of fluoroscopy guided percutaneous transpedicular spinal biopsies at a tertiary hospital Dr Shivam Bhikha	SOCM4B-03
14:00-14:10	Facilitating care during and after treatment withdrawal in the intensive care unit: physicians perspectives Mr Emmanuel Kwame Korsah	SOCM4A-04	14:00-14:10	Correlation between corneal endothelial cell density and pterygium size: patients at St John Eye Hospital Dr Aamina Hajee	SOCM4B-04
14:10-14:20	A novel technique for the correction of sagittal synostosis: FEASR and barrel stave osteotomy Dr Wickus Neethling	SOCM4A-05	14:10-14:20	Shoulder and elbow function following antegrade humeral nailing and plate fixation in midshaft humeral fractures Dr Nabeela Kazee	SOCM4B-05
14:20-14:30	Root cause analysis of mortalities associated with acute appendicitis at a central academic hospital Ms Rukudzo Chehore	SOCM4A-06	14:20-14:30	The Epidemiology of patellar fractures in a tertiary institute in a developing country Dr Yenziwe Ngema	SOCM4B-06

14:30-14:40	Outcomes of patients with adhesive small bowel obstruction at a central hospital in Johannesburg Ms Sharna Smith	SOCM4A-07	14:30-14:40	
14:45-15:00	REFRESHMENT BREAK			
SESSION 5 POSTER PRESENTATIONS VENUE: LEN MILLER CHAIRPERSON: Prof Pascaline Fru				
15:00-15:05	The G1862T mutant of HBV induces upregulation of fibronectin expression and Wnt/β pathway Dr Aurelie Deroubaix			SOCM5-01
15:05-15:10	Reporting rates and presence of dental pathology on CT Brain scans at a Johannesburg Hospital Dr Evidence Ndou-van Zyl			SOCM5-03
15:10-15:15	Pneumococci serotype distribution among hospitalized adults with community-acquired pneumonia in South Africa in COVID-19 era Mr Grant Munkwase			SOCM5-04
15:15-15:20	Missing and deceased in South Africa: A study using $^{87}\text{Sr}/^{86}\text{Sr}$ to identify mobility and provenance Mr Lawrence Hill			SOCM5-05
SESSION 6 INVITED SPEAKER VENUE: LEN MILLER CHAIRPERSON: Prof Deirdre Kruger				
15:30-16:00	Statistical significance vs clinical significance Prof Jonathan Levin, University of the Witwatersrand (South Africa)			
SESSION 7 KEYNOTE LECTURE AND PRIZE-GIVING VENUE: LEN MILLER CHAIRPERSON: Prof Shakeera Holland				
16:00-16:45	Familial hypercholesterolaemia – from a lethal disorder in childhood to a manageable dyslipidaemia today Prof Derick Raal, University of the Witwatersrand (South Africa)			
16:45-17:30	PRIZE-GIVING: Prof Daynia Ballot & Adjunct Prof Kebashni Thandrayen			

SESSION 1A: PAEDIATRICS & CHILD HEALTH

Category: MSc/Medical Scientist/Researcher/Lecturer

SOCM1A- 01

Association between tobacco exposure, blood pressure, and arterial stiffness in South African adults and children

Ms Betty Nembulu

Developmental Pathways for Health Research Unit (MRC)

Introduction: Sociodemographic factors, health status and health behaviour have all been associated with arterial stiffness. We examined the association between tobacco use or exposure and pulse wave velocity (PWV, a marker of arterial stiffness) in black South African adults and children against a background of other known risk factors.

Objectives: To compare urine and serum cotinine levels in black South African adults and children and to determine if a higher cotinine level is associated with elevated PWV.

Methods: Two datasets were used: African-PREDICT (A-P; n=587 apparently healthy black adult men and women, 20-30 years) and Birth-to-Twenty-Plus (Bt20; n=95 black adult women, 28-68 years and n=47 black children, 4-10 years). A cotinine value >10 ng/ml in urine (Bt20) or serum (A-P) was considered as tobacco exposed and carotid-femoral PWV was measured using the SphygmoCor XCEL

device. Regression analysis included cotinine and other known risk factors.

Results: One third of adults (32%) and almost half of all children (45%) were tobacco exposed with the prevalence of elevated blood pressure (BP) approximately twice as high as their non-exposed counterparts (adults, p=0.014; children, p=0.017). Cotinine was the only variable that significantly associated positively with PWV in both adults and children in univariate analysis (p<0.05), but only MAP remained significant for adults in multivariate analysis (p=0.001).

Conclusions: In this sample, tobacco exposure was adversely associated with vascular health in adults and children. BP was higher in the tobacco exposed adults and children compared to their non-exposed counterparts. These findings suggest tobacco cessation programs for adults should include screening for blood pressure and consider the impact of tobacco exposure on children's vascular health.

Category: MMed/Registrar

SOCM1A- 02

Optimising blood culture collection techniques to minimize contamination rates in a public sector paediatric department

Dr Lucy Wilson, Prof David Moore, Dr Jeannette Wadula

Paediatrics & Child Health

Introduction: Blood culture (BC) is the gold standard in diagnosing clinically significant bacteraemia in hospitalised children. An important limitation of BC is contamination with skin commensals, which gives rise to false positive results and unnecessary healthcare related expenditures.

Objectives: We conducted a quality improvement project (QIP) of BC contamination rates in children (0-14 years of age) admitted in the general paediatric wards at Chris Hani Baragwanath Academic Hospital, in pre-intervention, intervention, and post-intervention phases. Our aim was to achieve significantly lower BC contamination rates during the intervention period.

Methods: The QIP was implemented over six months (01 December 2022 through 31 May 2023), with the three successive periods lasting two months each. During the intervention phase, clinicians were given daily instruction on correct BC collection technique using a standardised operating procedure (SOP). All BCs obtained during the pre- and post-intervention periods were unobserved, and their

contamination rates were compared to those of the intervention period.

Results: Contamination occurred in 66 (9.0%) of 732 BC, 54 (5.5%) of 974 BC, and 71 (9.7%) of 732 BC in the pre-intervention, intervention and post-intervention periods, respectively. Intervention period BC contamination rates were significantly lower than those in the pre- and post-intervention periods (P-values 0.007 and 0.002, respectively). In the intervention period, BC contamination rates were 3.9% (10/254) in the observed BCs and 6.1% (44/720) in the unobserved BCs (P-value 0.253). Unobserved BC in the intervention phase had a significantly lower rate of contamination compared to the pooled unobserved BCs from the pre- and post-intervention periods (6.1% vs 9.4%; P-value 0.012).

Conclusions: Contamination rates of BCs were significantly reduced with the implementation of an SOP. However, significant rebound in BC contamination occurred when the SOP was not being re-enforced, which demonstrates the need for ongoing teaching of clinicians around optimisation of BC collection techniques

Multi-drug resistant bacterial infections among very low birthweight infants with late-onset sepsis

Prof Daynia Ballot, Dr Genesis Licon

Project for Improving Neonatal Care (PRINCE) Research programme

Background: An estimated 2.4 million babies died within the first 28 days of life in 2020. The third leading cause of neonatal death continues to be neonatal sepsis. Sepsis-causing bacterial pathogens vary temporally and geographically, and with a rise in multi-drug resistant organisms (MDRO), pose a threat to the neonatal population.

Methods: This is a single center, retrospective study of very low birth weight (VLBW) infants with LOS admitted to a neonatal unit in South Africa. We aimed to calculate the prevalence of multi-drug resistant (MDR) infections in this population. The data collected included demographic and clinical characteristics, length of hospital stay, risk factors for MDRO and mortality, and microbiology results. Logistic regression was used to assess the association between pre-specified risk factors with MDR infections and mortality.

Results: Of 2,570 VLBW infants admitted, 34% had LOS, of which 33% was caused by MDRO. Infection with *Acinetobacter* spp., *Pseudomonas* spp., extended spectrum beta lactamase (ESBL) *Klebsiella* spp., or *Escherichia coli* was associated with the highest mortality in the LOS cohort. Infants with congenital infections (aOR = 5.13; 95% CI: 1.19, 22.02; p=0.028) or prior history of necrotizing enterocolitis (NEC) (aOR = 2.17; 95% CI: 1.05, 4.49; p=0.037) were at significantly higher risk for MDR infections.

Conclusions: More than 1/3 of LOS cases in VLBW infants were caused by MDRO in this study. MDR infections cause substantial neonatal mortality. Antimicrobial stewardship programs, infection control protocols and ongoing surveillance are needed to prevent further emergence and spread of MDR infections worldwide.

Admission hypothermia in very low birth weight newborns at Charlotte Maxeke Johannesburg Academic Hospital

Dr Angidi Mauree

Paediatrics & Child Health

Background: Hypothermia is associated with increased morbidity and mortality rates. Very low birth weight (VLBW) newborns are at an increased risk of hypothermia especially within the first few hours after delivery.

Objectives: To determine the prevalence, associated risk factors, and outcomes of admission hypothermia in VLBW newborns, at Charlotte Maxeke Johannesburg Academic Hospital (CMJAH), a quaternary hospital in Johannesburg, South Africa.

Methods: This was a retrospective descriptive study of all VLBW newborns born over a seven year period (from 1st January 2013 to 31st December 2019) at CMJAH. Comparisons between hypothermic and normothermic newborns as well as between moderately-to-severely hypothermic and mildly hypothermic newborns were done. Multivariate binary logistic regression with 95% confidence interval and a p-value of < 0.05 was used to identify variables which had a significant association.

Results: Mean gestational age and birthweight of enrolled newborns was 28.9 ± 2.7 weeks and 1097 ± 250 g respectively. Prevalence of

admission hypothermia was 61.5 % of which 54.3% was mild hypothermia, 43.9 % was moderate hypothermia and 1.8 % was severe hypothermia. VLBW newborns with hypothermia were more likely to have a birthweight < 1000 g [aOR 1.37 (1.12-1.68)] and less likely to be associated with early onset sepsis [aOR 0.51 (0.30-0.88)]. VLBW newborns with moderate to severe hypothermia were less likely than those with mild hypothermia to have received antenatal steroids [aOR 0.66 (0.48-0.89)]. There was no significant association of mortality in either VLBW newborns with hypothermia as compared to those with normothermia [aOR 0.95 (0.76-1.19), p value 0.67] or in VLBW newborns with moderate to severe hypothermia as compared to those with mild hypothermia [aOR 0.76 (0.46-1.26), p value 0.29].

Conclusions: Prevalence of admission hypothermia in VLBW newborns is high and reinforces the need for thermoprotective measures in this population.

Whole genome sequencing and molecular surveillance of Influenza in South African children

Ms Jeanine Du Plessis, Mr Nicholas Dean, Dr Shama Khan, Mr Musawenkosi Ncube, Prof Ziyaad Dangoor, Dr Vicky Baillie, Prof Shabir Madhi

Paediatrics & Child Health: Infectious Diseases

Annually, seasonal influenza epidemics result in five million cases of severe disease and 300,000 fatalities globally. Children in low-to-middle-income countries (LMIC) are disproportionately affected by influenza-related lower respiratory tract infections (LRTI). Hemagglutinin and neuraminidase are key targets for influenza vaccine development due to the immune response elicited during viral entry and release of progeny virions, respectively. Ongoing surveillance is needed to ensure continued vaccine effectiveness.

In order to investigate the molecular epidemiology of influenza in South African children, an all-cause LRTI surveillance study was

conducted in a tertiary public hospital in South Africa between 2021 and 2022.

Nasopharyngeal swabs collected from participants were tested for common respiratory pathogens including influenza A and B using a total nucleic acid amplification test. Influenza-positive samples were sequenced and phylogenetically analysed.

Three percent (n=224/6744) of the participants tested positive for influenza – influenza A accounted for 78% (n=175/224) and influenza B for 21% (n=49/224). Whole genome sequencing of 107 influenza-positive samples revealed the presence of three influenza viruses:

H3N2 (n=25/107, 23%), H1N1pdm09 (n=60/107, 56%), and B-Victoria (n=22/107, 21%). Further, six clades of the hemagglutinin region were identified, and a single Tamiflu-resistant mutation was detected in the neuraminidase region.

This study enhances the understanding of the molecular epidemiology of influenza, emphasizing the importance of

surveillance in informing vaccine development. Insights into the genetic characteristics and diversity of influenza strains aid in pandemic preparedness, reducing the public health burden of influenza-related morbidity and mortality on vulnerable populations such as children in LMIC.

Category: MMed/Registrar

SOCM1A- 06

The biochemical and radiological profile of genetic hypophosphatemic rickets and the response to conventional treatment

Dr Nikhila Isaac

Paediatrics & Child Health: Endocrinology

Introduction: Limited knowledge exists regarding the response to conventional therapy in children with hypophosphatemic rickets in low and middle income countries, where Burosumab is unavailable and unaffordable (1). This study aimed to assess the biochemical profile of genetic forms of hypophosphatemic rickets, including XLH, at presentation and monitor the response to conventional therapy.

Methodology: Children under 18 years attending the Metabolic Bone clinic at Chris Hani Baragwanath Academic Hospital in Soweto, South Africa, between January 2006 and April 2020 were included. The study enrolled children diagnosed with genetic hypophosphatemic rickets based on their baseline biochemical profile, including normal serum calcium and PTH (not >2.5 X upper normal limit) and low phosphate levels (below normal reference limits for age). Patients with or without a positive family history of hypophosphatemic rickets who started conventional treatment with phosphate and one alphacalcidol were included.

Results: Seventy patients met the inclusion criteria. Mean age at first presentation was 59.1 (±44.6) months. The majority were black

South African (n=54, 77%), with 32 (46%) having a positive family history. Patients exhibited short stature, with mean height-for-age z-score (HAZ) of -3.4 ± 1.79 . Mean calcium, phosphate, alkaline phosphatase, parathyroid hormone levels, and median Thacher score were 2.3 ± 0.16 mmol/L, 0.84 ± 0.19 mmol/L, 776.6 ± 531 IU, 7.15 ± 4.8 mmol/L, and 8 (4-8), respectively. Improvement in ALP (776 ± 531 vs 525 ± 232 ; $p < 0.001$) and Thacher scores (8 [4-8] vs 3.5 [2-6.5]; $p = 0.03$) occurred from baseline to last follow-up and 4 years post-baseline, while serum phosphate and HAZ remained unchanged.

Conclusion: Conventional therapy for hypophosphatemic rickets did not improve HAZ, despite radiological and ALP improvements. Adherence to therapy was a major challenge for most patients.

1. Carpenter TO, Whyte MP, Imel EA, et al. Burosumab Therapy in Children with X-Linked Hypophosphatemia. NEJM. 2018;378(21):1987-98

SESSION 1B: INTERNAL MEDICINE / OPHTHALMOLOGY

Category: PhD/Postdoctoral Fellow/Senior Academic staff/Consultant

SOCM1B- 01

Comparison of non-invasive diagnostic modalities for ocular surface squamous neoplasia at a tertiary hospital

Dr Roland Hollhumer, Prof Pamela Michelow, Prof Susan Williams

Neurosciences: Ophthalmology

Introduction: Ocular surface squamous neoplasia is the most common ocular surface cancer. The gold standard for diagnosis is excision with histology. With the increased use of topical chemotherapy in the management of OSSN, there has been an increase the use of less invasive diagnostic modalities including optical coherence tomography, impression cytology and methylene blue stain.

Aims: The aim of the study is to assess non-invasive diagnostic modalities for ocular surface squamous neoplasia, when compared to histology.

Methods: A prospective case-control study was conducted of patients presenting with conjunctival masses to a tertiary eye hospital in Johannesburg, South Africa. Patients completed an interview and had three non-invasive diagnostic tests: optical coherence tomography, impression cytology and methylene blue stain. A biopsy

with histology was performed as the gold standard to confirm the diagnosis.

Results: One hundred and eighty-two conjunctival masses of 175 patients were evaluated. There were 135 lesions identified as OSSN on biopsy and 47 lesions were benign on histology. Optical coherence tomography had a sensitivity and specificity of 87.2% (95% CI: 80.0 – 92.5) and 75.6% (95% CI: 60.5 – 87.1) respectively, when an epithelial thickness cut-off of 140um was used. Masking was found in 46% of cases due to leukoplakia or increased thickness of the mass. Cytology had a sensitivity of 72.4% (95% CI: 62.5 – 81.0) and specificity of 74.3% (95% CI: 56.7 – 87.5). Methylene blue had a high sensitivity of 91.9% (95% CI: 85.9 – 95.9), but low specificity of 55.3% (95% CI: 40.1 – 69.8).

Conclusion: Optical coherence tomography had a high sensitivity and specificity as a non-invasive test for the diagnosis of OSSN in our population.

The Histone deacetylase inhibitor SAHA (Vorinostat™) modulates metastatic properties of DLD-1 colorectal adenocarcinoma cells

Mr Carlo Berrino, Dr Aurelie Deroubaix, Dr Aadilah Omar, Dr Clement Penny
Internal Medicine: Medical Oncology

Introduction: Colorectal cancer (CRC) is the 4th most prevalent and 6th most fatal cancer in South Africa. Patients often present with advanced stage tumours requiring surgical resection and chemotherapy. SAHA (Vorinostat™) a histone deacetylase inhibitor (HDACi) is an FDA approved second line drug for treating T-cell cutaneous lymphomas. Since HDACs epigenetically regulate gene expression and reactivate tumour suppressor pathways, the therapeutic role of SAHA and its effects on metastatic DLD-1 colorectal cancer cells are investigated here.

Objectives and methods: Firstly, bioinformatic analyses, including HTDocking, UNIProt and PANTHER were used to identify potential target proteins for SAHA, together with their associated signaling pathways. Here, SAHA was primarily found to inhibit Histone deacetylase 4 (HDAC4) protein, which is known to promote EGFR proliferative and metastatic signaling. Following this, functional cellular assays were used to determine the viability, stem cell activity

via spheroid formation and the migration potential of DLD-1 cells, respectively.

Results: SAHA treatment reduced DLD-1 cell viability in a dose dependent manner, with a 2 µM concentration decreasing viability to 50% (IC50) ($p = 0.0062$), and in addition, the ability of DLD-1 cells to form actively growing spheroids was inhibited ($p < 0.0001$). Interestingly, SAHA promoted cell migration by 50% over a two-hour period, after which migration slowed to a rate similar to the untreated control. This may relate to the 2-hour half-life of the drug.

Conclusions: In summary, this study has shown that SAHA treatment regulates key characteristics of metastatic cancer cells, reducing cell proliferation, targeting of stem cell functionality (spheroids), but however seems to promote cell migration. Future research will assess SAHA's effect on the cell cycle, apoptotic pathways and HDAC4 expression in DLD-1 cells.

The association of FGFR2 expression and splice isoforms with breast cancer subtypes

Dr Caroline Dickens, Prof Raquel Duarte, Ms Therese Dix-Peek
Internal Medicine

Introduction: Gene expression profiling of breast cancer tumours identified 5 molecular subtypes, each with different growth rates, treatment response and clinical outcome. Genome- wide association studies identified loci associated with breast cancer susceptibility. The Fibroblast Growth Factor Receptor 2 (FGFR2) gene was a top scoring candidate gene.

FGFR2 is involved in many biological processes and undergoes mutually exclusive splicing to give rise to FGFR2-IIIb, expressed in epithelial cells, or FGFR2-IIIc, expressed in mesenchymal cells. This isoform switch is associated with Epithelial Mesenchymal Transition, a process that underlies the progression of cancers.

Objective: To investigate the association of FGFR2 expression and splice isoform expression with breast cancer subtypes.

Methods: The cBioPortal for cancer genomics was used to interrogate FGFR2 expression. Plot data of log transformed FGFR2 gene expression were downloaded for PAM50 subtypes. FGFR2 splice variants were downloaded from Ensemble Genome Browser 108 together with reference genome information, and transcript variants aligned using MUSCLE. TCGA SpliceSeq was used to

interrogate FGFR2 splice patterns. Data were analysed using STATA v14.2.

Results: Elevated FGFR2 expression is significantly associated with luminal, oestrogen receptor (ER+) positive and invasive lobular carcinomas, whereas lower FGFR2 expression associated with basal, epidermal growth factor receptor 2 (HER2) positive and triple-negative breast cancer; and invasive ductal carcinomas. The FGFR2-IIIb isoform was significantly enriched in ER+ breast cancer, while the mesenchymal FGFR2-IIIc isoform was significantly prevalent in HER2+ cancer.

Conclusions: FGFR's are increasingly being considered as therapeutic targets for a variety of cancers, including breast. Thus there is a need to determine the mechanism by which they facilitate progression of cancer. The expression of FGFR2, and its isoforms, are differentially expressed in breast cancer subtypes. FGFR2 expression is related to maintaining epithelial characteristics of breast cells whereas as a reduction of FGFR2 expression is associated with more aggressive, basal forms.

Proteomic analyses of Huh-7 cells transfected with subgenotype A1, with and without the G1862T mutation

Ms Kiyasha Padarath, Dr Aurelie Deroubaix, Prof Anna Kramvis
Hepatitis Virus Diversity Research Unit

HBeAg is a non-structural, secreted protein of hepatitis B virus (HBV). Its precursor, P25 has a signal peptide, directing P25 to the endoplasmic reticulum (ER). Here, it is post-translationally modified by signal peptide cleavage. The G1862T (valine to phenylalanine) mutation, frequent in subgenotype A1 HBV isolated from

hepatocellular carcinoma patients, interferes with signal peptide cleavage. This results in the accumulation of P25 in the endoplasmic reticulum and Golgi intracellular compartment and the activation of unfolded protein response pathways. The objective of our study was to determine if this accumulation can affect other host signalling

pathways. Mass spectrometry was used to analyse the proteome of Huh-7 cells transfected with either wild-type or G1862T subgenotype A1 replication-competent clones. Proteomic analysis at 5 days post-transfection revealed significantly differentially expressed proteins between G1862T transfected cells compared to wildtype ($p < 0.05$). These differentially expressed proteins were further classified into pathways. Immune system pathways (interleukin signalling, inflammation mediated by chemokine and cytokine signalling, T cell activation, Toll receptor signalling) were significantly increased by

1.5-fold in cells transfected with G1862T compared to wildtype. Moreover, proteins involved in DNA replication (replication protein A and DNA primase (PRIM2)) were significantly upregulated (2.3-fold increase) in mutant compared to wildtype transfected cells. As HBeAg acts a tolerogen and immunogen and uncontrolled cell proliferation is a hallmark of cancer, this mutation may have important implications in persistence and in contributing to the high hepatocarcinogenic potential of subgenotype A1. Ongoing future work will confirm the differentially expressed pathways in vitro.

Category: Undergraduate student/Honours student/Intern/Medical Officer

SOCM1B- 05

Resveratrol impact on survival of candida species and how it combats candida albicans virulence properties

Ms Carla Hattingh

Clinical Microbiology and Infectious Diseases

Candidiasis is a disease caused by *Candida* species, the primary causative agent being *C. albicans*, with *C. glabrata* and *C. tropicalis* being the secondary causative agents of this disease. Candidiasis can range from mild to life-threatening. Vulnerable patients include immunocompromised individuals (HIV/AIDS, or diabetes patients), and in-house hospital patients. Due to *Candida* rapidly developing resistance against current antifungal medications researchers are turning to medicinal plants to find solutions. *Mezoneuron benthamianum* is a traditional medicinal plant used by traditional healers throughout West Africa to treat a variety of diseases. Medicinal plants consist of phytochemicals, which are bioactive compounds that give them their medicinal properties. Aim: To determine the impact of resveratrol on the survival of *Candida* and how well it combats the virulence factors caused by *C. albicans*; which include adherence, germ tube and phospholipase production. Methods that were used included broth microdilution method using a

96-well plate to determine a minimum inhibitory concentration (MIC) of resveratrol against *Candida*. The minimum fungicidal concentration (MFC) was determined by plating out each dilution from each well on SDA agar. The adherence effect was determined using human oral epithelial cells which were mixed with the resveratrol and clinical *C. albicans* samples. Germ tube formation was determined using spider media and was considered positive if the pseudohyphae were twice the size of a cell. Phospholipase production was determined using egg-yolk agar, to see how much precipitated product was formed to calculate the phospholipase index. The MFC and MIC results were identical consisting of a MIC/MFC of 0,625mg/ml, $\frac{1}{2}$ MIC/MFC of 0,313mg/ml and $\frac{1}{4}$ MIC/MFC of 0,156mg/ml. The MIC and sub-MICs were highly effective, inhibiting all *C. albicans* virulence factors. These results indicate that resveratrol could be an effective drug option for treating oral candidiasis.

Category: MMed/Registrar

SOCM1B- 06

COVID-19: An evaluation of predictive scoring systems in South Africa

Dr Brent Prim, Prof Ismail Kalla, Dr Jarrod Zamparini, Dr Farzahna Mohamed

Internal Medicine

Background: The Coronavirus Disease 2019 (COVID-19) pandemic, caused by SARS-CoV-2, has resulted in more than 700 million cases worldwide. Sepsis and pneumonia severity scores assist in risk assessment of critical outcomes in patients with COVID-19. This allows healthcare workers to triage patients, by using clinical parameters and limited special investigations, thus offering the most appropriate level of care.

Methods: A retrospective cohort study of 605 adult patients hospitalised with moderate to severe COVID-19, at a tertiary state hospital in South Africa. Evaluating the utility of the CURB65, NEWS2 and ISARIC-4C Mortality Score, in predicting critical outcomes, using clinical characteristics on admission. Outcomes included in-hospital mortality, invasive mechanical ventilation, and intensive care unit admission (ICU). Performance of severity scores and risk factors was assessed by area under the receiver operator characteristics (AUROC) analysis and logistic regression.

Findings: A total of 605 records were used, 129 (21%) non-survivors, 101 (17%) ICU admissions and 77 (13%) requiring invasive ventilation. Greater odds of mortality was associated with moderate and severe risk groups of the CURB65, ISARIC-4C and NEWS2 score. Mortality AUROC curve analysis for the CURB65 score was 0.76 (95% CI: 0.71–0.8), 0.77 (95% CI: 0.73–0.81) for the ISARIC-4C and 0.77 (95% CI: 0.73–0.82) for the NEWS2 score. The CURB65 score had a sensitivity of 86% with 12.8% mortality, ISARIC-4C score a sensitivity of 87.6% with 8% mortality and NEWS2 score a sensitivity of 92.2% with 8.6% mortality.

Interpretation: In 605 hospitalised patients with moderate to severe COVID-19, predominantly infected by the ancestral strain, good performance of the NEWS2 and ISARIC-4C score in predicting in-hospital mortality was noted. The CURB65 score had a high mortality rate in its low-risk group suggesting unexplained risk factors, not accounted for in the score, thus limiting its utility in the South African setting.

SESSION 2A: PAEDIATRICS & CHILD HEALTH

Category: PhD/Postdoctoral Fellow/Senior Academic staff/Consultant

SOCM2A- 01

Epstein Barr virus risk stratification to predict post-transplant lymphoproliferative disorder in paediatric liver transplant recipients

Dr Priya Walabh, Prof David Moore, Dr Christina Hajinicolaou

Paediatrics & Child Health: Gastroenterology

Introduction: Post-transplant lymphoproliferative disorder (PTLD) is a clinically heterogeneous potentially fatal complication of paediatric liver transplant (PLT) recipients with an incidence of 10 to 20% in liver transplant recipients and a mortality which has improved over recent years with the advent of improved therapeutic options.

Objective: To determine the incidence, complications, and associated factors for developing PTLD in PLT recipients at our transplant center from January 2012 to August 2019. Permission for this study was obtained from HREC.

Methods: Retrospective record review of 150 paediatric liver transplant recipients was done. Data collected included clinical and demographic data including Epstein Barr Virus (EBV), Cytomegalovirus (CMV) serology of donor and recipients, EBV viral loads, presentation, histology, treatment, and outcome of recipients with PTLD.

Results: The median age at transplant was 29.2 months (IQR 15.6-

58.4) and follow up was 30 months (IQR 13- 55). The incidence of PTLD in our cohort was 17/150 (11.3%). The median weight of recipients who developed PTLD was 10.0 kg (IQR 7.5-12.2) which was significantly lower ($P = 0.006$) at the time of transplant compared to those patients who didn't develop PTLD. Patients who developed PTLD were also significantly younger (<18 months) ($P = 0.002$) and 15/17 (88.2%) were in the high-risk category ($P = 0.003$). {Table 1}. A cut-off EBV viral load >57136 cop/ml (Log 5.1) using the ROC curve showed a specificity of 70.1 % and a sensitivity of 76.5% for developing PTLD [AUC 0.77 95% CI (0.69- 0.84) $P < 0.0001$]. (Figure 1)

Conclusion: EBV stratification and viral loads can be helpful in predicting PTLD. Malnutrition parameters need to be explored in future studies as weight significantly predicted development of PTLD in PLT recipients.

Category: MMed/Registrar

SOCM2A- 02

The impact of HIV status on the outcome of paediatric intensive care unit admissions

Dr Kim Whitehead, Prof Daynia Ballot

Paediatrics & Child Health

Introduction: HIV infected and HIV exposed uninfected (HEU) children are important groups within the PICU with unique health risks. Our study looked at how HIV exposure and infection impact presentation and outcomes in PICU in an era of improved access to ART and PMTCT.

Methods: A retrospective analysis of children admitted to PICU at a tertiary/quaternary hospital between 2015 and 2019. De-identified data was obtained from an existing database and analysed using SPSS. Descriptive statistics (medians, interquartile ranges, frequencies and percentages) were used to analyze the sample. The sample was then divided into three groups (HIV negative, HEU and HIV infected) and their presentation and outcomes compared using Chi-Squared and Kruskal-Wallis tests with a significance level set at $p < 0.05$.

Results: Our study showed that 16% (109/678) of children admitted to PICU were HEU and 5.2% (35/678) HIV infected. HIV infected

children were admitted at a younger age (median two months) and had an increased incidence of lower respiratory tract infections than HIV negative children ($p < 0.001$). HIV infected children required longer ventilation and admission than HIV negative and HEU children ($p < 0.001$). HIV infected children had a higher mortality (40%) ($p = 0.02$) than HIV negative children (mortality 22.7%); however when comparing children admitted with a medical (non-surgical) diagnosis the difference in mortality was not statistically significant ($p = 0.273$). HEU children were admitted at a younger age (median three months) with a higher incidence of lower respiratory tract conditions than HIV negative children ($p < 0.001$). HEU children had similar outcomes to HIV negative children with no significant difference in duration of ICU stay ($p = 0.163$); ventilation ($p = 0.443$) or mortality ($p = 0.292$).

Conclusion: HIV infected children presented with more severe disease requiring longer ventilation and admission. HEU had similar outcomes to HIV negative children.

Category: MMed/Registrar

SOCM2A- 03

Ventilatory support and surfactant use in extremely low birth weight infants over a decade, Johannesburg

Dr Minah Mavunda, Prof Daynia Ballot, Dr Tanusha Ramdin

Paediatrics & Child Health

Introduction: In Southern Africa, extremely low birth weight infants (ELBWI) are a major contributor to neonatal mortality and morbidity. The ELBWI are at the greatest risk of respiratory distress syndrome (RDS), and the severity of RDS is inversely related to gestational age.

Objective: To review ventilatory support and surfactant use in ELBWI and its effect on survival of ELBWI at Charlotte Maxeke Johannesburg Academic Hospital (CMJAH), South Africa.

Methods: This was a secondary analysis of an existing database of ELBWI admitted at CMJAH neonatal unit from 01 January 2008 to 31

December 2017. The different modes of respiratory support were compared for survivors and non survivors.

Results: A total of 1 184 ELBWI were enrolled in the study with a mean birth weight of 823.6g. Respiratory distress syndrome was diagnosed in 93.2% (1 103/1 184) infants, with 88.2% (1 044/1 184) receiving respiratory support. Respiratory support was offered in the form of surfactant replacement therapy (SRT), nasal continuous positive airway pressure (NCPAP) and/or conventional mechanical ventilation (CMV). Eighty one percent (706/902) of the infants

received SRT, 62% (706/1 146) received NCPAP and 20% (225/1 135) received CMV. The survival of ELBWI who received SRT was 88.3% ($p < 0.001$) and for infants who received NCPAP was 65.2% ($p = 0.019$). Conventional mechanical ventilation was not associated with increased survival, 19.2% ($p = 0.677$). The overall survival of ELBWI during the study period was 46% (540/1184).

Conclusion: The implementation of SRT and NCPAP are effective in the management of RDS in ELBWI.

Category: MMed/Registrar

SOCM2A- 04

Introduction of dolutegravir and the early viral response seen in South African children and adolescents

Dr Tshiamo Mafora, Dr Nicola van Dongen, Dr Thalia Ferreira

Paediatrics & Child Health

Introduction: Dolutegravir (DTG) was introduced into South African HIV management guidelines rapidly since November 2019 in both adult and paediatric first line antiretroviral treatment (ART) regimens. Objectives: We assessed the rate of virological suppression over two years in paediatric patients switching to DTG as part of first line treatment.

Methods: We performed a secondary analysis of an existing, prospectively followed cohort in Johannesburg, South Africa. Children and adolescents on first line ART switching to DTG (between November 2019 and November 2021) were included. Baseline characteristics (at DTG switch) included age, weight, gender, viral load (VL), CD4, and pre-switch regimen. Past ART exposure and past viraemic periods (years VL < 1000 copies/ml) were assessed and VL suppression rates (< 50 copies/ml) were calculated at 6, 12 and 24 months post-switch. Associations with non-suppression were assessed using uni- and multivariate analysis.

Results: Of 747 participants that switched to DTG, 724 (97%) qualified for a VL and 697 (96%) had at least one VL after switch. Overall 83% (450/543) were suppressed at 6 months, 86% at 12, 86% at 24 months. Overall, at a median of 637 days after switch, 90% (624/697) were suppressed at their last VL. Factors associated with non-suppression at the last VL included: missing a follow-up visit by > 90 days post-switch to DTG ($p = 0.0026$), switching to DTG with a VL of > 50 rather than < 50 copies/ml ($p = 0.042$), having the blood test done July-December ($p = 0.011$), and exposure to viraemia ≥ 1000 copies/ml for > 2 years between first ART start and DTG switch ($p = 0.071$).

Conclusion: In our population, similar to other studies, VL suppression was effectively maintained in the majority of patients after switching to DTG. The switch however resulted in a loss of suppression in some patients and caution is needed in children and adolescents with missed visits and extensive prior viraemia.

Category: MMed/Registrar

SOCM2A- 05

The burden of poisoning in children hospitalized at a tertiary-level hospital in South Africa

Dr Mahtaab Khan

Paediatrics & Child Health

Introduction: Globally, childhood poisoning, accounts a significant proportion of emergency department admissions and is the fourth common cause of accidental injuries in children according to the World Health Organization. There is a paucity of data from low- and middle-income countries on the burden and causes of poisoning in children.

Objective: To describe the incidence, case fatality rate, and types of poisoning in children admitted to a tertiary-level hospital in Johannesburg, South Africa.

Methods: This was a retrospective descriptive study of children less than 14 years of age hospitalized with poisoning from January 2016 to December 2021 at Chris Hani Baragwanath Academic Hospital. Children were identified from a discharge summary database using ICD-10 codes that described poisoning. Trends in the incidence of poison exposure were reported. Using logistic regression, we determined the predictors of mortality in children that were poisoned.

Results: Of the 60,901 admissions during the study period, 2652 (4.4%) children were diagnosed with poisoning. Most (71.3%) children were less than five years of age and 55% were male. The incidence of poisoning per 100,000 was highest at 108 (95% CI: 96.8 – 115.2) in 2019 and decreased to 77 (95% CI: 73.9 -80.7) in 2020 and 60 (95% CI: 56.6-62.5) in 2021.

The top three causes of poisoning were organic solvents (37.6%), medications (32.9%), and pesticides (17.5%). The overall case fatality rate was 2.1%. In a multivariate analysis, poisoning secondary to pesticides (aOR, 13.9 95% CI: 4.52-60.8; $p < 0.001$), and unspecified agents (aOR, 95% 12.7 CI: 3.27-62.8; $p < 0.001$) were more likely to cause death compared the reference.

Conclusion: In conclusion, we report a high incidence of poisoning in children which was lower during the COVID-19 pandemic. Public health measures to reduce the burden of organic solvents, medications and pesticide poisoning are urgently warranted.

Care for the caregiver, how caregiver mortality affects treatment outcomes – an observational cohort study

Dr Josephine Keal

Paediatrics & Child Health

Introduction: With global improvements to HIV services and care, paediatric and adolescent populations are emerging as vulnerable and high-risk groups. Adherence to prescribed treatment regimens is a necessity for effective long-term therapy. Caregivers play an integral role in ensuring adherence to treatment.

Objectives: We investigated the effect of the loss of a caregiver on children and adolescents' HIV treatment outcomes.

Methods: We analysed prospective longitudinal data collected during routine clinical visits from the clinical visit database at a paediatric and adolescent HIV clinic in Johannesburg, South Africa. Data completeness was assessed and then was separated into children/adolescents with a documented primary caregiver mortality and those without. Viral loads for the year of 2021, regimens, CD4 percentages and counts, and anthropometry was analysed.

Results: Caregiver vital status was recorded in 1171 (93%) of the 1260 patients included in the study. There were 115 (9%) children or

adolescents with a documented loss of caregiver(s). Amongst 1120 mothers 100 (9%) had died, of 460 fathers 18 (4%) died and one (1%) of 100 other caregivers died. The majority of the deaths occurred between 2015-2021. During the year 2021, stunting and wasting were seen significantly more in the participants who had lost a caregiver in the past than those who had not ($p=0.01$, 0.02 respectively).

Conclusion: Our study showed that nearly 10% of the clinic population in 2021 had experienced the loss of a primary caregiver. Caregiver death was poorly captured and documented in the clinic database, suggesting that the clinicians were unaware of the loss or were not documenting it in their notes. Significantly higher rates of wasting and stunting suggested that children experiencing the loss of a caregiver were prone to chronic illness or malnutrition. Our study hopes to highlight the importance of treating children and caregivers as a unit.

SESSION 2B: GENERAL SURGERY

Category: PhD/Postdoctoral Fellow/Senior Academic staff/Consultant

SOCM2B- 01

Overview of endocrine hypertension treated in surgery at Chris Hani Baragwanath Academic Hospital

Prof Ifongo Bombil, Professor Ramazani Adelin Muganza, Dr Rotondwa Netshamutsindo

Surgery: General (Breast / Endocrine)

Introduction: The majority of hypertension are "essential", but the endocrine etiology although uncommon is believed to be underestimated especially in developing countries. Screening of selected group of patients may prove to be beneficial in identifying the correctable cause and spare the patient the dire complications related to the target organ damage. There is scarcity of publications on endocrine hypertension in Sub-Saharan Africa. The aim of this study is to reflect on the profile of endocrine hypertension at Chris Hani Baragwanath Academic Hospital with emphasis to lead time and the management thereof.

Objectives: To determine the etiologies, the lead time to diagnosis of endocrine hypertension and to reflect on the surgical approach and early complications

Methods: This descriptive observational study reviewed all surgical procedures performed for endocrine hypertension at CHBAH over the past 8 years from January 2013 to December 2020. Parameters

analysed included the demographics, the etiologies, the location of the disease, the surgical approach, the histopathology, the incidence of malignancy, the delay from the onset of hypertension to the diagnosis of endocrine etiology (lead time) and the 30 days outcome. **Results:** Of the 47 patients analyzed, 66% were female and 34% were male. The mean age was 38 years. The majority of the cases were due to catecholamines secreting tumours (60%). Overall, 47% of procedures were completed laparoscopically. Altogether, the known mean lead time were longer ranging from 5 to 12 years. The incidence of malignancy was 15% and the 30 days mortality of 4% were due to adrenocortical carcinoma. The complications contributed in the diagnosis of 8.5% of cases.

Conclusions: The catecholamines producing tumours were the most common. Nearly half of the cases were completed laparoscopically. The lead time was longer and there were more tumours located on the left side. There were 4.0% (2/47) mortality.

Category: PhD/Postdoctoral Fellow/ Senior Academic staff/Consultant

SOCM2B- 02

A retrospective analysis of outcomes and complications of living and deceased donor split liver transplantation in Johannesburg, South Africa

Dr Richard Crawford^{1,2}, Prof Jerome Loveland^{1,3}, Dr Bernd Stroebele³

Surgery: General

Introduction: South African transplant centres are faced with significant challenges in meeting the need for liver transplantation, owing to the low and ever decreasing number of deceased donor organs. To increase organ availability, Deceased Donor Split Liver Transplant (DDSLT) and Living Donor Liver Transplant (LDLT)

programmes were initiated in the Transplant Unit at the University of the Witwatersrand.

Aim: To evaluate the outcomes of the two programmes in relation to international data.

Methods: A retrospective analysis of de-identified recipient and donor variables from all adult and paediatric DDSLT and LDLT transplants conducted between 2013 and 2021 was performed. Comparison of categorical study variables between graft types was done with the X2 test. Continuous variables were compared by the independent samples t-test. Cox Proportional Hazards regression was performed to examine the effect of graft type on recipient and graft survival. All comparisons were made unadjusted, and adjusted for recipient age, recipient ethnicity, donor sex, and graft-to-recipient weight ratio (GWRWR) (for the paediatric cohort); and for donor age and GWRWR (for the adult cohort).

Results: A total of 181 paediatric and 48 adult liver transplants have been performed since the inception of the two programmes. Chronic

liver failure, specifically intra and extrahepatic cholestatic disease was our main indication for liver transplantation in both cohorts. There were no significant differences between the DDSLT and LDLTs with respect to pre- or post-discharge intervention, pre-discharge death, length of stay, and recipient or graft survival within both the paediatric and adult groups. Our overall one- and three-year survival estimates were 77% (70-83%), 71% (64-78%) for the paediatric cohort and 77% (62-87%), 66% (50-78%) for the adult cohort.

Conclusion: The results of this study demonstrate comparable outcomes between DDSLT and LDLT indicating that both methods are effective approaches for liver transplantation within our setting.

Category: PhD/Postdoctoral Fellow/Senior Academic staff/Consultant
SOCM2B- 03

A 3D-printed artificial non-stoichiometric interpolyelectrolyte complex for tissue restoration and regeneration after liver trauma

Ms Kate Da Silva, Professor Yahya Choonara, Professor Pradeep Kumar
Wits Advanced Drug Delivery Platform Research Unit

Introduction: Current therapeutic approaches for liver trauma are focused on symptomatic treatment rather than facilitating tissue regeneration. Due to the importance of the native extracellular matrix (ECM) in the formation of new tissues, the development of a system that can promote tissue regeneration after injury could beneficially influence the hepatoreparative process and potentially decrease fibrotic scar formation.

Objectives: To design a biomaterial-based, 3D-printed hydrogel using a combination of polymers for localised/sustained delivery of bioactives to stimulate the secretome to potentially facilitate hepatoregeneration. Furthermore, to characterise/elucidate the physicochemical/physicomechanical properties of the 3D-printed material in the physiologically relevant state.

Methods: A 3D-printed, non-stoichiometric interpolyelectrolyte complex (NIPEC) bioink was formulated through blending Cationic Gelatin (CG), modified with ethylenediamine, and Sodium Alginate (NA). To achieve good printing resolution through a 0.2 mm internal diameter needle for a 10x10 mm scaffold, extrusion pressure ranged

from 3.8-4.3 bar with a print speed of 10 mm/s. NIPEC biomaterial gels were subjected to physicochemical, physicommechanical and in vitro analyses.

Results: ¹H NMR confirmed the composition of the CG polymer through the addition of two peaks at $\delta=2.9$ ppm and $\delta=3.4$ ppm from the ethylenediamine moiety. X-ray diffraction (XRD) indicated that the gelatin polymer loses its crystallinity due to the reduction of hydrogen bonding between the amino and carboxylic acid groups. Geometric shape fidelity was maintained after 3D-printing. Crosslinking the polymer chains was successful owing to the water insolubility above 37 °C due to the newly formed ionic crosslinks. Improvement in both the surface wettability and solubility was noted for CG in comparison to gelatin alone. Biocompatibility was confirmed in HepG2 cells.

Conclusion: A novel 3D-printable biomaterial was developed through the blending of native polymers and may provide the crucial solution to overcoming the current therapeutic shortfalls by potentially assisting in liver restoration and regeneration.

Category: PhD/Postdoctoral Fellow/Senior Academic staff/Consultant
SOCM2B- 04

Spectrum of thoracic ascending aortic aneurysms at a peri-urban tertiary hospital

Prof Ruchika Meel, Prof Michael Hasenkam, Dr Ricardo Goncalves, DR Kelly Blair, Dr Shungu Mogaladi
Internal Medicine

Introduction: Thoracic ascending aortic (TAA) aneurysms are an important cause of disability and death and require early detection for effective management.

Objective: To describe the spectrum of TAA aneurysms at a peri-urban tertiary hospital.

Methods: This was a descriptive retrospective study based on clinical and echocardiographic imaging data of patients with TAA aneurysms from October 2017-October 2022. Advanced strain imaging was performed to measure left ventricular strain and circumferential strain (CS) of the ascending aorta as a proxy measurement of aortic compliance.

Results: The study comprised 139 cases of TAA aneurysms (52.5% females) with a mean age of 50±14.8 years with 45 age and gender matched controls. Most patients (95%) were of African ethnicity. The main etiologies were hypertension (41.7%), HIV (36.6%), connective tissue disease (10.7%), congenital (2.2%) and mixed pathologies

(8.6%). Two-thirds of patients (69.7%) presented in heart failure, 10% presented with aortic dissection. Majority (59.7%) were in New York Heart Association class II. Echocardiography revealed enlarged aortic dimensions compared to controls ($P<0.001$). TAA aneurysms were complicated by severe aortic regurgitation (AR) in half (50.3%) of patients. The mean LV ejection fraction ($46.9\pm12.7\%$) was reduced compared to controls ($P<0.001$). Aortic CS was reduced compared to controls ($4.4(3.2-6.2)\%$ vs $9.0(7.1-13.4)\%$, $P<0.001$). Aortic stiffness was higher in the aortic aneurysm group compared to controls (15.39 ± 20.65 vs 5.04 ± 2.09 , $P=0.001$). LV longitudinal strain ($-13.9\pm3.9\%$ vs $18.1\pm6.7\%$), was reduced compared to controls ($P<0.001$). Most patients were on heart failure therapy. Surgery was performed in 29.4% and overall mortality was 7.9 %. Mortality for acute aortic dissection was 40%.

Conclusion: TAA aneurysms associated with hypertension and HIV are common in this predominantly African female population and are

associated with considerable morbidity and mortality. Echocardiography with strain imaging are potential tools for

screening and risk stratifying TAA aneurysms.

Category: Undergraduate Student/Honours Student/Intern/Medical Officer

SOCM2B- 05

Validation of the usefulness of risk scoring systems for predicting mortality in upper gastrointestinal bleeding

Ms Alexia Pullinger, Trisha Chhiba, Refilwe Ledwaba, Jancobus Lubbe, Danielle Mallabone, Musa Ndaba, Dale Philip, Prof Stephens Moeng Maeyane, Prof Thifhelimbilu Emmanuel Luvhengo

Medicine

Introduction: The Rockall Score (RS) and Glasgow Blatchford Score (GBS) are commonly used for predicting mortality in patients with UGIT bleeding.

Objective: To compare the usefulness of the RS and GBS risk scoring systems for predicting mortality due to UGIT bleeding in a South African setting.

Methods: A retrospective longitudinal study of patients 18 years and older with UGIT bleeding was conducted. Data retrieved included demographic details, vital parameters on presentation, co-morbidities, initial laboratory results, endoscopic findings and outcome. Either chi-square and Fisher's exact test were used to compare categorical findings, and independent t-test and Mann-Witney test were used for continuous data. Statistics and Data Science (STATA/SE) software version 17.0 was used for statistical analysis. A p-value of <0.05 was considered statistically significant. Permission to conduct the study was received from the local ethics committee (M210951).

Results: Overall, 517 records, of which 65% were of male patients, were found suitable for analysis. Thirty-two percent were over 60 years, and 45% had either minor or major co-morbidities. Peptic ulcer disease (PUD) accounted for 73.8% of UGIT bleeding. The overall mortality was 3.48% and was significantly influenced by Complete Rockall Score (p-value <0.001) and age (p-value <0.01), admission heart rate (p-value <0.02) and the existence of cardiac disease (p-value < 0.001). The area under ROC curve for CRS was 0.8026 (95% CI 0.709-0.896) and 0.638 (95%CI 0.516-0.760) for GBS (p = 0.0230).

Conclusion: Mortalities occurred in patients above the age of 60 years who had higher Complete Rockall Score and GBS or pre-existing cardiac condition. Complete Rockall Score and not GBS was useful in predicting mortality in patients presenting with UGIT bleeding.

SESSION 4A: SURGERY, FAMILY MEDICINE, PSYCHIATRY & NEUROSCIENCES

Category: MSc/Medical Scientist/Researcher/Lecturer

SOCM4A- 01

Menstrual hygiene management in schools in South Africa: knowledge, experience and impact on school attendance

Ms Bongwiwe Zulu, Dr Cecilia Milford, Dr Renjini Devaki, Ms Amanda Mona, Ms Tammany Cavanagh

WitsMRU

Background: Proper management of menstruation requires that women and girls have access to timely and accurate knowledge and information, comfortable and safe menstrual health products, adequate water, sanitation and hygiene (WASH) facilities. This research explores experiences of menarche/menses, knowledge and understanding of menses, sanitary product use, impact of menses on school attendance, and the school menstrual health management programmes.

Methods: This study was conducted in one sub-district in each of three provinces (Eastern Cape, Gauteng and KwaZulu-Natal). These schools had an existing support programme, providing sexual and reproductive health (SRH) education in partnership with the Department of Education (DoE). Three senior primary schools were purposively sampled in each sub-district (nine schools in total) to participate in the research.

This was a mixed methods study – in-depth interviews (IDIs), focus group discussions (FGDs), an anonymous survey and a sanitation

audit of female learner toilet facilities in a sample of schools in each participating district were conducted.

Results: A total of 332 anonymous surveys were completed by learners (241 females, 91 males). A total of 81 learners participated in eight FGDs (63 girls and 18 boys), and 12 parents participated in two FGDS, across three provinces ten IDIs included various stakeholders. Only three-quarters of learners who had started menstruating (76.3%, n=58) reported they had been given prior information about what to expect. Half of female learners participating in the survey (50%, n=38) who had started menstruating reported they had “ever missed school” for a reason relating to their menstrual cycle. The mean number of days absent was 5.3 days in the last school term. The main reasons for missing school were pain related to their cycle (86.1%, n=31), with a third (30.6%, n=11) reporting insufficient or no menstrual products.

Conclusion: Schools should ensure that menstrual health issues are prioritised.

Characteristics of women initiated on opioid substitution therapy at primary healthcare level in Tshwane

Ms Daniela Sefora Goeieman, Prof Robert Mash, Dr Natasha Gloeck, Dr Andrew Scheibe

Family Medicine & Primary Care: Clinical Associates

Introduction: South Africa is witnessing a rise in the use of substances such as alcohol, cannabis, opioids etc., and substance use practices like the intravenous injecting of illicit drugs. Women who use drugs (WWUD) face specific challenges compared to men, such as higher rates of HIV infection, engagement in sex work, unsafe injecting practices, and gender-based violence. However, this population's access to treatment and gender-sensitive interventions remains limited, leading to unmet needs and increased vulnerability.

Objectives: To investigate the characteristics of WWUD accessing opioid substitution services in primary health care, to inform gender-sensitive services.

Methods: The descriptive observational study used existing data of all 199 adult women with an opioid use disorder on opioid substitution therapy (OST) collected by the Community Orientated Substance Use Programme (COSUP) from 2016 to 2022 in the City of Tshwane, South Africa. Existing data were extracted from an electronic database and paper-based files. Data was analysed with

the Statistical Package of Social Sciences and associations of variables with retention on OST for >6 months were analysed.

Results: Participants were unemployed, most falling within the 20-29 years age range and accessing services from community-based facilities. One in three women had experienced intimate partner violence and 19% were pregnant whilst on OST. Retention on OST was significantly associated with age at initiation ($p=0.047$), knowledge of HIV status ($p=0.029$), an increase in the ASSIST score ($r=0.171$, $p=0.023$), and methadone dose ($r=0.339$, $p<0.001$). Factors such as race, employment status, health system level, pregnancy, intimate partner using substances, IPV, route of administering opioids, and having TB and/or hepatitis C infection did not show a significant relationship with retention on OST ($p>0.05$).

Conclusion: The study emphasises the intersectionality of substance use harms and retention of OST, calling for further research and the implementation of comprehensive interventions in harm reduction programs.

Population incidence of presumed community-acquired-pneumonia in South African adults across three hospitals: A spatial distribution.

Ms Taile Portia Kgoete, Dr Kennedy Otlowmbe, Dr Firdaus Nabeemeeah

Internal Medicine: Infectious Diseases

Introduction: In HIV-prevalent settings, the burden of community acquired pneumonia (CAP) remains high. Expanding current PCV vaccination programs may protect at-risk adults. We report.

CAP incidence in three hospitals (Chris Hani Baragwanath Academic Hospital [CHBAH], Polokwane-Mankweng [PMH] and Klerksdorp/Tshepong Hospital Complex [KTHC] Hospitals)

Methods: This was a surveillance study of adults presenting to three public sector hospitals with signs and symptoms suggestive of CAP conducted between February 2019 and February 2022.

Population incidence and spatial statistics to identify hot and cold spots were conducted.

Results: 3477 adult patients were counted of whom 54.01% were male, 32.18% were reported to be people living with HIV(PLWH),

91.46% were black with median age of xx. Among PLWH, 26.51% had presumed CAP. The population incidence of presumed CAP was 3.55 per 100,000 people, with 1.83 cases per 100,000 people in Gauteng, 10.92 North-West, and 3.11 Limpopo. Most patients hailed from nearby areas (what is nearby- 5km? from hospital). No clustering was observed (Moran's Index= -0.022956, z-score= -0.068079, and p-value= 0.95), however hotspots and cold spots were present in certain areas.

Conclusion: The study found spatial variations (cold and hot spots) across provinces and reported high presumed CAP population incidence among People Living With HIV. These findings highlighted the importance of identifying hotspots and at-risk individuals for vaccination policies.

Facilitating care during and after treatment withdrawal in the intensive care unit: physicians perspectives

Mr Emmanuel Kwame Korsah, Professor Shelley Schmollgruber

Family Medicine & Primary Care: Clinical Associates

Introduction: One out of five patients dies after intensive care admission. Most of these deaths occur after a decision is made to limit life-sustaining treatments. In the intensive care unit, physicians are placed in a precarious situation where they hold the overall responsibility for patients' treatment and are therefore positioned to initiate and lead end-of-life decisions, including the withdrawal of treatment.

Objective: To explore physicians' perspectives on facilitating care during and after the withdrawal of life-sustaining treatments in the intensive care unit

Methods: An exploratory qualitative design was used. Nine ($n = 9$) physicians with more than five years of practice and additional ICU experience were purposively sampled from one adult ICU in an academic hospital and interviewed. Interviews were transcribed verbatim and analyzed. Ethics approval was obtained (M210229) prior to the start of the study.

Results: An overarching theme, "Supporting patients and families throughout the process," emerged after data analysis. The sub-themes that explain the theme include: symptom management and comfort; dignity and respect; information sharing; emotional support;

family involvement and presence; and spiritual support. Physicians see it as their duty to support patients and their families during and after treatment withdrawal.

Conclusions: The withdrawal of treatment remains an integral part of ICU practice. Physicians are committed to caring for and supporting both the dying patient and family through the entire process,

especially during the decision-making process, the withdrawal of treatment process, and the dying process. It is an area that most physicians are uncomfortable with, as they are not trained, especially the young, inexperienced physicians. There is a need to support physicians through continuous end-of-life training and education.

Category: MMed/Registrar

SOCM4A- 05

A novel technique for the correction of sagittal synostosis: FEASR and barrel stave osteotomy.

Dr Wickus Neethling, Dr Jason Labuschagne, Dr Denis Mutyaba, Prof John Ouma

Neurosciences: Neurosurgery

Introduction: Surgical correction is often required for the cosmetic and occasional secondary neurodevelopmental complications of untreated sagittal stenosis. Early suturectomy with a rigid endoscope followed by orthotic cranial helmet therapy is one of the accepted treatment options. To the best of our knowledge, endoscopic treatment with the aid of a flexible endoscope has not been described. Presented herein is our experience treating paediatric patients with sagittal synostosis using minimally invasive flexible endoscopic techniques followed by cranial helmet moulding therapy.

Objectives: The aim of this study was to determine if good anthropometric outcomes could be achieved following FEASR for isolated sagittal craniosynostosis

Methods: A retrospective analysis of patients who underwent FEASR between 2018-2020 was performed. Patients under the age of 6 months diagnosed with isolated sagittal synostosis were considered eligible for FEASR. Exclusion criteria included syndromic synostosis or patients with multiple suture synostosis. Cephalic index was the primary measure of cosmetic endpoint.

Results: A total of 18 consecutive patients met criteria for this study. The mean age at the time of surgery was 3.4 months. All patients underwent a wide strip craniectomy with no need to convert to an open procedure. The mean width of the strip craniectomy was 3.61cm. Estimated blood loss ranged from 5 to 30 millilitres. Mean operative time was 75 minutes. No intra-operative complications were experienced. No children required re-operation. Mean preoperative cephalic index was 67.7. Mean cephalic index at six weeks and one year were 77.1 and 76.3, respectively. The mean percentage change in cephalic index from preoperatively to the twelve month follow up was 10.44 ($p < 0.001$).

Conclusion: In this modest, single-hospital series, we demonstrate feasibility of FEASR to treat sagittal synostosis, with favourable cosmetic outcomes. The cosmetic results, morbidity profile and resource utilization appear similar to procedures conducted via traditional rigid endoscopy.

Category: Undergraduate Student/Honours Student/Intern/Medical Officer

SOCM4A- 06

Root cause analysis of mortalities associated with acute appendicitis at a central academic hospital

Rukudzo Chehore, Ms Vanshikha Taparia, Thanduxolo Tyumre, Tafadzwa Chitagu, Lubanzi Chiya, Jessie Lindeque, Muhummad Moosa, Azwindini Mulaudzi, Prof Maeyane Stephens Moeng, Prof Thifhelimbilu Emmanuel Luvhengo

Surgery

Introduction: Mortality due to acute appendicitis is less than 6% but is higher in patients with complicated disease or have comorbidities.

Objective: To determine factors associated with mortalities in patients with acute appendicitis.

Methods: Permission to conduct the study was obtained from the local ethics committee (M211041). We reviewed records of patients over 17 years old admitted with acute appendicitis over a 5-year period. Data retrieved included demographic information, comorbidities, clinical and laboratory findings, surgical treatment and outcomes. We used Statistics and Data Science (STATA) software version 17.0 for statistical analysis. A p -value < 0.05 was considered statistically significant.

Results: Two hundred and thirty-one records met inclusion criteria and 71% (164/231) were males. Their mean age of participants was 31 ± 12.2 years, and 69.3% were 20-40 years old. Twenty-nine

(12.6%: 29/231) participants were HIV positive (12.6%), 82.8% (24/29) of whom were males. Fifty-eight (25.3%:58/231) participants had complicated acute appendicitis. Eighteen (7.8%:18/231) participants died and 83.3% (15/18) of the deaths occurred in males. Half of the mortalities (9/18) occurred in the 40-60 age group, and the influence of age was statistically significant (p -value = 0.000). Thirteen (72.2%) participants who died had presented more than 72 hours since the onset of symptoms. The median CRP of the participants who died was 247.5 mg/L compared to 99 mg/L for the survivors, and the difference was statistically significant (p -value = 0.014).

Conclusion: Around 25% of patients present with complicated disease. Mortality due to acute appendicitis is higher in males, in individuals above the age of 39 years and in patients who present after 72 hours following the onset of symptoms.

Outcomes of patients with adhesive small bowel obstruction at a central hospital in Johannesburg

Ms Sharna Smith, Mr Kevin Stone, Rohan Talesara, Saira Mahmood, Karla Roloff, Samukeliswe Magwaza, Unoma Okonkwo, Lloyd Magunde, Prof Thifhelimbilu Luvhengo

Surgery: General

Introduction: Small bowel obstruction (SBO) accounts for around 20% of surgical emergency presentations with an abdominal cause. Adhesions are the leading cause of SBO.

Objective: To determine the factors that influenced outcomes in patients who presented with ASBO at a South African tertiary hospital.

Methods: A retrospective record review was conducted on patients who presented with bowel obstruction over a 3-year period. The demographic and clinical factors associated with outcomes were studied using univariate and bivariate analysis. Prior ethical clearance was obtained before the study commenced (M210927).

Results: A total of x records were found and 73.3% (90) were SBO. Sixty-six (73.3%: 66/90) of SBO were due adhesions (ASBO) patients were included in the study. Forty-two (63.6%: 42/66) of patients who had ASBO were male. Thirty-three (50%:33/66) of ASBO patients had previous surgery. Forty-three (65.2%:43/66)

required surgery managed surgically, and 7.6% (5/66) of the patients who had ASBO demised. There was no statistically significant difference in mortality between patients managed conservatively compared to those who underwent surgery [0% (0/25) vs 12.2% (5/41), (p=0.1478)], but all patients who demised were managed surgically. The median age of patients that demised was significantly higher than that of discharged patients [73 vs 43 years, (p=0.0011)]. The median age of presentation of females was significantly higher than that of males [50 vs 38 years, (p=0.0153)], and female gender was also significantly associated with mortality (p=0.0048). A higher median urea was found to be associated with a higher risk of death (p=0.0099).

Conclusions: Adhesive small bowel obstruction is the most common form of bowel obstruction and majority occur in males. Sixty-five of ASBO required surgical intervention. Mortality due to ASBO was higher in female, older age and patients who had elevated urea.

SESSION 4B: SURGERY, ORTHOPAEDIC SURGERY, OPHTHALMOLOGY AND RADIOLOGY

The microbiology and resistance profiles of diabetic foot sepsis at Charlotte Maxeke Johannesburg Academic Hospital

Ms Simran Patel, Anelisa Sipahlanga, Charalambia Glynos, Emeline Jooste, Gopala Maharaj, Johannes Petrus Meyer, Onyinyechukwu Mbajorgu, Wandile Ngubane, Prof Thifhelimbilu Emmanuel Luvhengo

Introduction: Diabetic foot sepsis (DFS) accounts for 80% of extremity amputations worldwide. Timely initiation of appropriate empirical antimicrobial therapy during management of DFS is critical.

Objective: To determine the main causative organisms and their susceptibility profile in patients who presented with DFS.

Methods: Prior permission to conduct the study was received from local ethics committee (M210943). The study A review of records of patients 18 years or older who were admitted and managed for DFS over a 3-year period was conducted. Data retrieved included demographic information, presenting complaint, duration of diabetes, co-morbidities, clinical findings, type of specimen collected and results of MC&S, treatment and outcome. Statistics and Data Science (STATA/SE) software version 17.0 was used for statistical analysis. A p-value of 0.05 was considered statistically significant.

Results: A total of 124 records were retrieved and 63.7% were of male patients. The mean age of males was 58.9 ±10.9 years

compared to 60.6 ±10.6 years for females. The MC&S results were only found in 53.2% (66/124) of the records which 53% (35/66) was from tissue specimens and 15.2% (10/66) from pus swab. The top 3 cultured organisms were *Enterococcus faecalis* (16%), *Proteus mirabilis* (10%) and *Staphylococcus aureus* (8%). The most prescribed antimicrobial was Augmentin at 62.5%. Eighty-eight percent, 80% and 67% of *Staphylococcus aureus*, *Proteus mirabilis* and *Enterococcus faecalis*, respectively were resistant to at least one antimicrobial.

Conclusions: Diabetic foot sepsis is more common in males. Augmentin is the most preferred antibiotic and 47% of patients with DFS are treated with antimicrobials without prior collection of specimens for MC&S. *Enterococcus faecalis* and *Proteus mirabilis* are the two most frequently cultured organism in DFS. At least 67% of all organisms are resistant to at least one antimicrobial. Routine collection of specimens for MC&S should be encouraged.

Life expectancy following amputation following amputation for diabetic foot sepsis at a regional hospital

Dr Thoriso Mokoala, Dr Etshumang Molefe, Mrs Tshifhiwa Mukheli, Mr Polly Mokoena, Ms. Anschen Venter, Prof Thifhelimbilu Emmanuel Luvhengo

Surgery: General

Introduction: Diabetes foot sepsis is the leading cause of amputation of lower extremity. Over 50% of patients who have had major lower extremity amputation due to diabetic foot sepsis are dead within 5 years following the procedure.

Aim: To determine the life expectancy of patients following amputation for diabetic foot sepsis at Leratong Hospital.

Methods: We conducted an audit of patients who had DFS and were admitted over a 5-year period. Data retrieved included demographic

information, clinical findings, co-morbidities, laboratory results and outcome. The duration from admission to time of death will be recorded in days. Occurrence of death will be confirmed from family members of the diseased using structured telephonic interview questionnaire hospital medical notes and general practitioners' records. Categorical findings were summarized using actual counts and percentages and compared either the Chi-square or Fisher's exact test. We used the mean with standard deviation or median and range to compare parametric and non-parametric continuous data, respectively. The Shapiro-Wilk test was used to test normality of data. Multivariate logic regression was done to analyse which were associated with the mortalities. We used Kaplan-Meier survival

curves to compare mortality trend among males and females. Statistical significance was set at a p-value below 0.05.

Results: Hundred and ninety-seven records were found of which 99.5% (196/197) of participants had Type 2 diabetes mellitus and 63.5% (125/197) were males. Associated morbidity included hypertension in 73.6%, obesity in 66%, alcohol use in 64.5%, smoking in 58.4% and hyperlipidaemia in 41.1%. Hundred and ninety (96.4%: 190/197) had amputation and 19.3% (38/197) died.

Conclusion: Diabetic foot sepsis was more common in males and 97% of all patients had an amputation. Mortality rate within 4 years following amputation was 19.3% and was higher in females and individuals with co-morbidities.

Category: MMed/Registrar

SOCM4B- 03

A review of fluoroscopy guided percutaneous transpedicular spinal biopsies at a tertiary hospital

Dr Shivam Bhikha

Surgery: Orthopaedic

Introduction: When a suspicious spine lesion is identified, an accurate diagnosis based on tissue biopsy is needed in order to direct towards the correct treatment protocol.

Several studies have demonstrated that the percutaneous fluoroscopy guided biopsy of a vertebral lesion is a safe, effective and accurate diagnostic tool and is preferred over open techniques when possible.

The aim of the study was to review percutaneous fluoroscopy guided transpedicular spinal biopsies at a tertiary hospital over a 6-year period.

Methodology: The research design was a retrospective study of patients who underwent a percutaneous transpedicular spinal biopsy under fluoroscopy guidance at a tertiary hospital over a six year period (1st January 2016 to the 31st December 2021).

The spine theatre registry and hospital records system were used as the source for data collection. Statistical analysis was conducted to determine the effectiveness of the transpedicular spinal biopsy,

compare spinal pathology amongst age and gender and to identify any complications.

Results: The study analysed 180 biopsies, with 120 yielding a positive result (66.67%). Of these 8.9% were pyogenic infection, 18.4% neoplasm, 36.7% Tuberculosis and 2.7% other. There were 75 males and 105 females with an age range between 9 and 86 years and mean age of 43.44. Comparing age and gender distribution showed no statistical significance ($p = 0.778$). Comparing biopsy result and gender showed no statistical significant relationship ($p = 0.970$). Comparison of biopsy result with age showed no statistical significant association ($p = 0.545$). Four complications were identified (2.22%).

Conclusion: The study showed that fluoroscopy guided percutaneous transpedicular biopsy is an effective modality in obtaining thoracic and lumbar vertebrae specimens in all age groups for a wide spectrum of spinal pathological lesions. The study also proves that it is a safe procedure with no long term complications.

Category: MMed/Registrar

SOCM4B- 04

Correlation between corneal endothelial cell density and pterygium size: patients at St John Eye Hospital

Dr Aamina Hajee

Neurosciences: Ophthalmology

Objectives: The aim of this study is to assess the correlation between endothelial cell density (ECD) and pterygium size in patients with a unilateral pterygium at St John Eye Hospital, Soweto. Due to the effects that pterygia may have on corneal endothelial cell parameters, it is important to investigate the effect that it has in our population to assist in better planning for intraocular surgery, corneal transplantation and refractive procedures which could further damage endothelial cell health, as well as to highlight the need to address endothelial protection prior to the use of endothelial toxic agents.

Design and methods: A cross sectional observational comparative study was conducted on 100 patients with a unilateral primary pterygium who attended the St John Eye Hospital In Soweto, Johannesburg between August 2021 and August 2022 to assess

corneal endothelial cell density, coefficient of variation, index of hexagonality and central corneal thickness using a non-contact specular microscope (Tomey EM-4000). The healthy eye (without a pterygium) of a patient was considered as a control.

Results: One Hundred patients were included in the study. Patients were aged between 18 and sixty years old, with primary pterygia. There was a statistically significant reduction in the mean corneal endothelial cell density (cells/mm) as well as a difference in the coefficient of variation, index of hexagonality and central corneal thickness between the pterygium eyes and control eyes.

Conclusion: Eyes with a pterygium were associated with a significant reduction in corneal endothelial cell parameters compared to the contralateral control eyes.

Shoulder and elbow function following antegrade humeral nailing and plate fixation in midshaft humeral fractures

Dr Nabeela Kazee, Dr Jason Du Plessis, Dr Susan Van Deventer, Dr Stiaan Steyn, Dr Ashleigh Olivia Lewis

Radiation Sciences: Diagnostic Radiology

Background: The choice of whether to perform antegrade intramedullary nailing (IMN) or plate fixation (PF) poses a conundrum for the surgeon who must strike the balance between anatomical restoration while reducing elbow and shoulder functional impairment. Most humeral middle third shaft fractures are amenable to conservative management given the considerable acceptable deformity and anatomical compensation by patients. Surgical treatment is reserved for cases that fall outside of these criteria as there are numerous well documented complications related to surgical treatment of the humerus shaft.

This study is concerned with the patient reported outcomes regarding shoulder and elbow function for IMN and PF respectively.

Methods: A prospective cohort study following up all the cases treated surgically for middle third humeral fractures from 2016 to 2022 at a single centre. Telephonically an analogue pain score, an American Shoulder and Elbow Society (ASES) score for shoulder function and the Oxford Elbow score (OES) for elbow function were obtained.

Results: One hundred and three patients met the inclusion criteria. Twenty four patients participated in the study, fifteen had IMN (62.5%) and nine had PF (37.5%). The shoulder function outcomes showed no statistical difference with an average ASES score of sixty-six for the IMN group and sixty-nine for the PF group. Women and employed individuals expressed greater functional impairment. Hand dominance has no impact on the scores of elbow and shoulder function post operatively.

The impairment of abduction score post antegrade nailing was higher in the antegrade nailing group than the plated group. The OES demonstrated greater variance in elbow function in the PF group with the IMN group expressing greater elbow dysfunction.

Conclusion: This study confirms that treatment of middle third humerus shaft fractures by plate fixation is marginally superior to antegrade intramedullary nailing in preserving elbow function and abduction ability.

The epidemiology of Patellar Fractures in a tertiary institute in a developing country

Dr Yenziwe Ngema

Surgery: Orthopaedic

Background: Patellar Fractures make up 1% of the trauma that presents to hospitals. The epidemiology has been assessed, mostly looking at patient registries based in Europe.

Aims: To Assess and describe the epidemiology of patellar fracture in an African context

Methods: A retrospective study was done in a tertiary hospital in Gauteng. The study assessed all the patients admitted with Patellar fractures between March 2022 to March 2023. Factors looked at included (amongst others); age, mechanism of injury, type and time to fixation and gender.

Inclusion Criteria: All patellar fractures admitted for theatre.

Exclusion Criteria: Chronic patellar fractures, patellar fractures with sepsis

Data Collection: Retrospectively data was entered and reviewed using our electronic database. The data was assessed according to epidemiology criteria.

Results: Thirty-eight patients met the inclusion criteria. The average age was 38 years (mean 14-68). The primary mechanism of injury was a fall, followed by assault. Transverse fractures accounted for 58% while fractures with distal pole comminution were 37%. 76% of the fractures were treated operative with tension band construct; either with tension band wire or cannulated screws. Open fractures accounted for 18% of the fractures.

Conclusion: The epidemiology of patellar fractures in a developing country is comparable to the developed world in some aspects including age, whether it's an open fracture and mechanism, but does deviate when it comes to time to surgery, type of surgery performed and type of fracture pattern seen.

SESSION 5: POSTER PRESENTATIONS

The G1862T mutant of HBV induces upregulation of fibronectin expression and Wnt/ β pathway

Dr Aurelie Deroubaix, Ms Kiyasha Padarath, Dr Jeyalakshmi Kandhavelu, Dr Stoyan Stoychev, Dr Previn Naicker, Dr Clement Penny, Prof Anna Kramvis

Hepatitis Virus Diversity Research Unit

Hepatitis B virus (HBV), endemic in South Africa, is the leading cause of hepatocellular carcinoma (HCC), where subgenotype A1 prevails. G1862T in the precore region is characteristic of A1. This mutation, found in 25% of HBV chronic carriers is frequently found in HBV isolated from HCC patients. P25, precursor of HBeAg, is

targeted to the endoplasmic reticulum (ER), where it is post-translationally modified to HBeAg. G1862T introduces an amino acid which hinders the signal peptide cleavage, leading to the accumulation of P25 in the ER. The aim is to determine the effect of G1862T on cellular cancer pathways. HuH7 cells were transfected

with subgenomic clones expressing HBeAg and precursors, with or without G1862T mutation, wtP25 and mtP25, respectively. Mass spectrometry analysis of the proteome revealed that transfection with mtP25 led to the upregulation of the integrin pathway, where fibronectin, a component of the extracellular matrix, is 2-fold upregulated, compared to cells transfected with wtP25. Immunostaining/confocal microscopy confirmed the higher expression of fibronectin in the cell membrane/extracellular matrix, with more filopodia in cells transfected with mtP25 than wtP25-transfected cells. Fibronectin, involved in immune evasion and maintenance of HBV replication, promotes an epithelial to mesenchymal transition where cells lose their adhesion and become

more motile. Furthermore, nrp1 protein expression was down-regulated by 1.7 fold. In cells transfected with mtP25, there was a partial relocation of β -catenin from the plasma membrane to the cytoplasm and the nucleus in 20% of the cells. Nrpb1 is involved in cancer cell proliferation through the regulation of Wnt/ β -catenin pathway. In conclusion, compared to wtP25, transfection of Huh-7 cells with mtP25 led to an enhanced expression of extracellular matrix, and an activation of Wnt/ β -catenin pathway proteins. This upregulation can promote cell invasion and may thus contribute to the carcinogenic potential of subgenotype A1 harbouring this mutation.

Category: MMed/Registrar

SOCM5- 03

Reporting rates and presence of dental pathology on CT brain scans at a Johannesburg Hospital

Dr Evidence Ndou-van Zyl

Radiation Sciences: Diagnostic Radiology

Introduction: South Africa is burdened by a high prevalence of dental pathology. It is common to encounter this dental pathology on computed tomography (CT) brain scans. The study aimed to raise awareness among radiologists on underreporting of dental pathology and highlight the impact this has on oral and general health.

Objectives: To assess the prevalence of dental pathology on CT brain scans performed in a tertiary hospital and determine the rates at which radiologists report on the encountered pathology.

Method: Original radiology reports of CT brain scans performed between September 2019 and October 2019 were reviewed to determine the frequency in which dental pathology was reported. Two qualified radiologists, Reader 1 and 2, blinded to the original reports' findings, reevaluated the corresponding CT images for dental pathology. Their findings were compared with the findings of the initial reports.

Results: A total of 160 CT scans qualified for the study. Registrars and consultants had no dental findings in the original radiology reports. However, Reader 1 and Reader 2 reported the presence of dental pathology in 92% and 79% of the CT scans, respectively. The most common findings by Readers 1 and 2 were dental caries (79 and 53%), followed by missing teeth (66 and 53%), periodontal disease (59 and 38%), periapical disease (54 and 29%), odontogenic sinusitis (19 and 3%), dental restorations (11 and 9%), and traumatic dental injuries (4 and 4%).

Conclusion: Radiologists do not report on dental pathology encountered during CT brain examinations. Recognition of these dental findings by radiologists may alter patient management and help reduce morbidity caused by dental diseases.

Category: MSc/Medical Scientist/Researcher/Lecturer

SOCM5- 04

Pneumococci serotype distribution among hospitalized adults with community-acquired pneumonia in South Africa in COVID-19 era

Dr Grant Munkwase, Kennedy Otjombe, Firdaus Nabeemeeah, Khuthadzo Hlongwane, Pattamukkil Abraham, Tumelo Moloantoa, Ebrahim

Variava, Neil Martinson

School of Pathology

Introduction: Recommendations for pneumococcal vaccination require periodic updating considering the ever changing pneumococci epidemiology and licensure of new vaccines. Pneumococci epidemiology in the Coronavirus Disease 2019 (COVID-19) era remains unclear in South Africa.

Objectives: We investigated pneumococci serotype distribution among hospitalized adults with presumed Community Acquired Pneumonia (CAP) in the COVID-19 era in South Africa.

Methods: Secondary analysis of oronasopharyngeal and blood serotypes from autolysin gene polymerase chain reaction positive samples from 317 adults admitted between March 2020 and October 2021 and followed up for two years. Prevalence and incidence rates were calculated, and incidence drivers explored by Poisson regression.

Results: Pneumococcal CAP prevalence was 23% (95% CI: 20.1 - 25.3). Serotypes 1, 3, 4, 5, 8, 9A/V, 12A/B/F/44/46, 19F, 22A/F, 33A/F/37 had leading prevalence and incidence rates in

oronasopharynx while serotypes 1, 3, 4, 8, 6A/B, 11A/D, 19A had leading prevalence in blood. The oronasopharyngeal prevalence for the 13-valent pneumococcal conjugate vaccine (PCV13) serotypes was 13.6% (95% CI: 11.9-15.3). Oronasopharyngeal carriage prevalence for all serotypes was significantly higher in males (70%), 35-49 years old participants (75%) and smokers (73%) while prevalence for the 23-valent pneumococcal polysaccharide vaccine serotypes was significantly higher in HIV positive participants on antiretroviral therapy (66%). The incidence rates varied with period of testing with the lowest all-serotype incidence rate in March 2020-October 2020 when compared to March 2021-June 2021 (incidence rate ratio = 0.30, 95% CI: 0.07-1.20).

Conclusion: Pneumococci remained important in CAP epidemiology in the COVID-19 era in South Africa with a big drop in 2020. The majority of the serotypes circulating in the COVID-19 era were covered by PCV20.

Missing and deceased in South Africa: A study using 87sr/86sr to identify mobility and provenance

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Forensic Medicine

Introduction: The use of stable isotopes, namely strontium, as a tool to estimate the geographic origin or provenance of biological material is well-established in ecology and archaeology. However, there has been increasing interest in forensic applications as a tool for human identification. This study aimed to test whether 87Sr/86Sr isotope analysis is a viable method to estimate the geographical origin of an individual.

Methods: This study was conducted at the Johannesburg Forensic Pathology Service Medico-Legal Laboratory. The sample consisted of both South African citizens and foreign migrants. Samples of tooth enamel (first molar), bone (rib), and nail (first toe) were collected for 87Sr/86Sr isotopic analysis during autopsies of the decedents. All samples were processed to create a fine homogenous powder. The resulting bone, tooth and nail powders were then digested using HNO₃ and H₂O₂. A Mass Spectrometer (MC-ICP-MS) housed in the Department of Geological Sciences (University of Cape Town) was used to run the samples. The samples were run with in-house

standards (NM95, BHVO-2 and NIST987) for quality assurance. Blanks were run every 10 samples to control for systematic errors.

Results: Fifty-two individuals were sampled comprising 33 South Africans, and 19 non-South Africans (including Mozambican, Zimbabwean, Basotho, Malawian and Nigerian). A significant difference was found between enamel isotope ratios with respect to the country of origin ($p < 0.01$), rib isotope ratios ($p < 0.01$), and nail isotope ratios ($p < 0.01$). A pairwise comparison showed a significant difference between all countries for all sample types except between individuals from Malawi and Zimbabwe.

Conclusion: There was enough of a variance in bioavailable 87Sr/86Sr for the individuals compared to those from other countries. The multi-tissue sample strategy presented a complex picture across different cohorts, it was shown to be a useful tool in identifying differences in 87Sr/86Sr signatures which were closely aligned to different nationalities/geographical regions.

POSTERS

	Presenter	Paper Title
1.	Dr Constance Adams	A retrospective evaluation of the low dose ACTH stimulation test in central adrenal insufficiency
2.	Dr Nicholas Brink	Systematic review of long-term impacts of heat exposure in-utero
3.	Dr Aurelie Deroubaix	The G1862T mutant of HBV induces upregulation of fibronectin expression and Wnt/ β pathway.
4.	Dr Jingisile Dlamini	A study of adult Aortic Valve Disease at a peri-urban tertiary hospital
5.	Dr Afikile Dutywa	Trends, and determinants of operative vaginal delivery at two academic hospitals in Johannesburg, SA 2005-2019
6.	Dr Vuyiswa Gantscho	Prevalence of depressive symptoms in adolescents living with HIV attending west rand clinics in Johannesburg
7.	Ms Paulina Hahne	Short-term outcomes of neonates with gastrointestinal atresia admitted to a hospital in South Africa
8.	Mr Lawrence Hill	Missing and deceased in South Africa: A study using $^{87}\text{Sr}/^{86}\text{Sr}$ to identify mobility and provenance.
9.	Dr Roland Hollhumer	Demographics, clinical presentation and risk factors of ocular surface squamous neoplasia at a tertiary hospital
10.	Ms Zakeeya Jhetam	Copper complexes induce apoptosis and increase expression of the stress-response protein, heme-oxygenase-1 in pancreatic cancer
11.	Dr Stina Larsson	Short-term outcomes of neonates with congenital heart defects at Charlotte Maxeke Johannesburg Academic Hospital
12.	Ms Aviwe Mgobozi	Clinical associates' education, training and professional practice in South Africa: A Scoping review
13.	Dr Nakedi Mmabatswa	An audit on the indication of peripartum hysterectomy performed at a tertiary institution in Johannesburg.
14.	Dr Grant Munkwase	Pneumococci serotype distribution among hospitalized adults with community-acquired pneumonia in South Africa in COVID-19 era
15.	Ms Shobana Nagaraj	Synthesis, characterization, and biological application of copper doped cobalt chromite nanoparticles
16.	Dr Vivash Naidoo	Virtual screening and molecular dynamic simulations of Tunicamycin C as glycosylation inhibitor in colorectal cancer
17.	Dr Evidence Ndou-van Zyl	Reporting rates and presence of dental pathology on CT brain scans at a Johannesburg Hospital
18.	Dr Wickus Neethling	Long term outcomes of flexible endoscope assisted suture release for the correction of sagittal synostosis
19.	Dr Wickus Neethling	Low cost production of postoperative cranial orthotic helmets for the LMIC setting
20.	Dr Yenziwe Ngema	Micro-organism contamination of cellphones if orthopedic surgeons in a tertiary institute
21.	Ms Kiyasha Padarath	Proteome of Huh-7 cells transfected with different (sub)genotypes of HBV prevailing in sub-Saharan Africa
22.	Ms Nosipho Pambo	Molecular identification and flucytosine susceptibility testing of <i>Cryptococcus</i> from South African patients
23.	Dr Nirav Patel	Telemedicine in the local context: A pilot study
24.	Dr Keitumetsi Sothoane	An adult presentation of Cor Triatriatum diagnosed as post-partum cardiomyopathy: A case study
25.	Dr Georgia Torres	Pulmonary embolus in an athlete - Mechanism, Assessment and Management
26.	Dr Ming-tung Wu	Acute Abdominal Aortic Occlusion- Rapid diagnosis using Point of Care Ultrasound
27.	Dr Pin-yi Wu	An extremely hypercoagulable case of thyro-cardiac disease

