UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA

UFS·UV
HEALTH SCIENCES
GESONDHEIDSWETENSKAPPE

FACULTY OF HEALTH SCIENCES
50th RESEARCH FORUM

Thursday 30 and Friday 31 August 2018

The Faculty of Health Sciences has a recognised research record and is globally competitive in terms of research; the Faculty Research Forum thus being an annual highlight on the calendar.

The 2018 Faculty Research Forum will, as in the past, be characterised by high quality submissions for presentations, showcasing the significant recent progress in research development.

With this, the 50th Faculty Research Forum, it is the Faculty's vision that emerging trends in research processes will come to fulfilment.

Message from Professor GJ van Zyl

Dean Faculty of Health Sciences

Professor GJ van Zyl's message for the Faculty Research Forum 2018

A special and warm welcome to the 50th Faculty Research Forum. Let us celebrate this achievement in style in 2018! Sometimes, great people do not realise the impact of their actions on history. This year we celebrate the giants in health sciences who had the vision of an academic initiative 50 years ago, even before the Faculty of Health Sciences was established. To them we owe all our gratitude and appreciation. Yet it is not only their achievements we need to celebrate – we need to celebrate 50 years of researchers who every year share their research with us! Without these contributions we would not have reached this milestone. Thank you to each researcher who presents this year for having invested the time and effort to participate in this prestigious event. I want us also to honour all the administrative and support staff behind the scenes who made this event possible for 50 years; the donors and sponsors and the Faculty community at large. Thank you!

We are disappointed that the National Minister of Health is unable to attend this year to celebrate with us. A cordial welcome is extended to Prof TS Pillay as the speaker at the FP Retief Lecture. We are grateful to have three highly distinguished external evaluators attending: Prof Andrew Argent, Prof Francois Strydom and Prof Grant Theron. Thank you for contributing to this special event!

The annual Faculty Research Forum is one of the most notable highlights on the calendar of the Faculty of Health Sciences at the University of the Free State. It is my pleasure to thank each of you for presenting your research, attending the paper or poster presentations, or contributing to the success of the forum in any other way. May I request your special attention for the session that presents the student winners of 2018. Every year this is a very enjoyable session that justly deserves the attention of all faculty members. Your attendance of this session allows our students the recognition they deserve.

My message at the opening this year will be about how to celebrate our history. *"Some are born great, some achieve greatness, and some have greatness thrust upon them." – William Shakespeare.*

Once again we are indebted to Prof Corli Witthuhn and to the Faculty Management who both provided generous sponsorships to the Faculty Research Forum. We are also deeply indebted to the organising committee for their expertise and effort behind the scenes; more so for this bumper edition that required additional effort. Finally I would like to repeat my invitation to attend the FP Retief Lecture, as well as the presentations by our external evaluators. May the special 50 year celebrations be a most rewarding experience. Welcome to all and enjoy the forum!

Prof GJ van Zyl
DEAN

HEALTH SCIENCES
GESONDHEIDSWETENSKAPPE
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Faculty of Health Sciences Faculty Research Forum 2018

EXTERNAL ADJUDICATORS

CLINICAL EXTERNAL ADJUDICATOR
Prof Andrew Argent

Professor Andrew Argent has worked in paediatric critical care in Cape Town for the last 30 years. He is currently Head of the Department of Paediatrics and Child Health at the University of Cape Town and the Red Cross War Memorial Children's Hospital. He is a past President of the World Federation of Pediatric Intensive and Critical Care societies, and the Critical Care Society of Southern Africa.

He has a particular interest in the provision of care to critically ill children in countries across the world, and has been involved in the development and implementation of training programmes for healthcare workers in pediatric critical care. He has also been involved in the development of appropriate responses to severe sepsis in children, particularly in the poorer countries of the world.

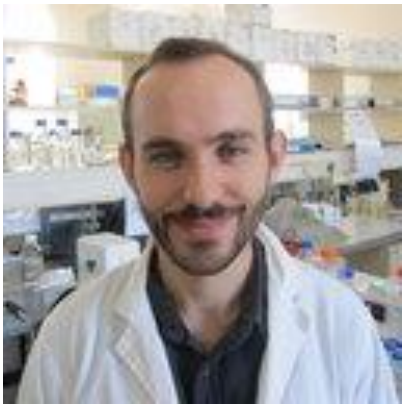
EDUCATIONAL EXTERNAL ADJUDICATOR
Prof Francois Strydom

Dr Strydom's experience in teaching and learning over the past 20 years, includes lecturing, tutoring and acting as international guest lecturer and speaker on topics within the fields of Psychology, Research Methodology and Higher Education. In recent research projects he has served as the project leader of both the South African Survey of Student Engagement (SASSE) that was conducted for the Council of Higher Education among 11 higher education institutions in South Africa, as well as the College Survey of Student Engagement (CSSE) which was conducted at 5 Further Education and Training Colleges. The research on student engagement has influenced national quality assurance practices, particularly in the field of teaching and learning.

Dr Strydom has collaborated with higher education consortiums and Higher Education South Africa (HESA) on various higher education initiatives related to access and success. He is the recipient of various research grants and awards and has published several articles focused on higher education issues. He received his D.Phil. in Psychology from Oxford University, which he attended as a Rhodes Scholar. In addition to his research he is involved in institutional initiatives to improve the undergraduate curriculum, the enhancement of teaching and learning, increasing academic support for at risk-students as well as improving the quality of academic advising. His research interests include student engagement, and improving the quality of teaching and learning in higher education.

LABORATORY EXTERNAL ADJUDICATOR
Prof Grant Theron

Prof Theron is an Associate Professor in the Division of Molecular Biology and Human Genetics, Faculty of Medicine and Health Sciences, Stellenbosch University (SU), in Cape Town. He is a member of the DST/NRF Centre for Excellence in Tuberculosis Research and the South Africa Medical Research Council Centre for Tuberculosis Research, both of which are embedded within SU.His core research interests are: (1) the infectiousness and transmission of tuberculosis, including drug-resistant tuberculosis, (2) the design and field evaluation of improved diagnostics for tuberculosis (including using specimens obtained by bronchoalveolar lavage), and (3) the microbiome's role in tuberculosis pathogenesis. I have a track record recruiting tuberculosis patients (including patients with HIV) in Africa for large multicentre clinical trials. I sit on the steering committee of the recently established African Microbiome Institute at SU.



His group (Clinical Mycobacteriology and Epidemiology, CLIME) has ongoing projects across the above three domains that recruit patients in Cape Town. He held a Training Fellowship in Public Health and Tropical Medicine from the Wellcome Trust, is a European and Developing Countries Clinical Trial Partnership Senior Fellow, and a British Royal Society Newton Advanced Fellow. He has published 70 papers in international peer-reviewed journals, and has registered one patent. This work has attracted international recognition and awards. He holds a P-rating from the South African National Research Foundation (the highest rating available to researchers <35 years old).

25th – FP RETIEF Lecture

INVITED SPEAKER

Professor Tahir Pillay

Prof Tahir Pillay is Chief Specialist, Professor and Head of the Department of Chemical Pathology, University of Pretoria and National Health Laboratory service, Steve Biko Academic Hospital and Director of the Division of Clinical Pathology and Clinical Pathology training programme and Honorary Professor of Chemical Pathology, University of Cape Town. He was also previously head of Chemical Pathology at the University of Cape Town and Deputy Vice Chancellor at the University of KwaZulu-Natal; Deputy Director, Institute of Cell Signalling, University of Nottingham, UK. He is President of the South African Association for Clinical Biochemistry and Laboratory Medicine. He has just been appointed by the Executive board of the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC), to head one of the 3 divisions (Communications and Publications Division) of the IFCC from January 2019 and is the first person from the African continent to head a division of the IFCC since its inception in 1952. He is one of only 2 full Professors of Chemical Pathology in South Africa and is also NRF-rated.

In South Africa, he has spearheaded the application of state-of-art digital technology in textbook publishing with the release of two acclaimed "4-dimensional" digital textbooks in laboratory medicine that have been published in 51 countries; "Practical Clinical Chemistry: core concepts" and "Interactive Mathematics for Laboratory Medicine".

He is also Editor-in-Chief of the London-based BMJ group journal, Journal of Clinical Pathology. He serves on several prestigious international committees: the Communications and Publication Division(CPD) executive committee of the International Federation of Clinical Chemistry and Laboratory medicine (IFCC) ; the International Committee of the Royal College of Pathologists, London and as country advisor to the Royal College of Pathologists; the Publications Core Committee of the American Association of Clinical Chemistry, the only member of an AACC committee from outside North America. Nationally, he serves as: Ministerial appointee to the HPCSA Medical and Dental Board (MDB); Council member of the College of Pathologists, SA and Senate member of the Colleges of Medicine, SA; Postgraduate Education and Training committee, HPCSA MDB; chair of the Curriculum Committee and Standard Generating Body of the HPCSA-MDB; Clinical Chemistry Expert committee, National Health Laboratory Service.

Prof Pillay graduated MBChB cum laude from the University of Natal in the 1980s. He obtained a PhD in biochemistry from the University of Cambridge and completed his postgraduate specialist training at Hammersmith Hospital, Imperial College, London and postdoctoral training in molecular cell biology and endocrinology at the University of California San Diego. He is a Fellow of the Royal College of Pathologists and the College of Pathologists, South Africa. He has been the recipient of numerous awards, including the Juvenile Diabetes International Fellowship, the American Foundation of Clinical Research outstanding postdoctoral award, the Wellcome Trust Senior Clinical Fellowship, Professors Prize from the Association for Clinical Biochemistry, UK and the Senior Researcher award from the South African Association for Clinical Biochemistry. Prof Pillay's research and extensive publications span the area of the molecular cell biology of insulin signalling, the cell biology of insulin resistance, molecular modelling of ligand-receptor complexes and development of new diagnostic probes for point-of-care testing using recombinant DNA technology.

FP RETIEF Lecture
25 YEARS OF SPEAKERS

1995 - Dr C Slabber

1996 - Prof T Bothwell
Is dietary iron overload still a problem in South Africa?

1997 - Prof DJ Ncayiyana
Meeting the Higher Education Challenges in the 21st Century.

1998 - Prof S Kallichurum
Ethics: New Challenges

1999 - Prof RC Franz
Veneuse Trombogenese – Eenhonderd jaar na Virchow. 'n Terugblik met waardering.

2000 - Prof J Terblanche
Academic advances in biliary tract surgery: A Cape Town perspective

2001 - Prof JV van der Merwe
Kwessies van Gesondheidsorg

2002 - Dr MW Makgoba
The impact of HIV/AIDS in South Africa

2003 - Prof FP Retief
Prof CJC Nel se loopbaan in die Faculteit / Prof CJ Nel's career span in the Faculty

2004 - Prof A du P Heyns

2005 - Prof Benataar
Trends in Bioethics: A Review

2006 - Prof B Mayosi
Quality Assurance: the fourth pillar of academic Medicine

2007 - Prof HH Vorster
Nutrition in South Africa: from Research to Polocy

2008 - Prof MJ Viljoen
Bestuur vir Navorsing in 'n Fakulteit Gesondheidswetenskappe

2009 - Prof PN Badenhorst
Keeping the Research flame burning

2010 - Prof LR Uys
Challenges of Higher Education in South Africa

2011 - Prof EWW Sonnendecker
The Omnipotence of Vitamin K

2012 - Prof DJV Weich

2013 – Prof JD Jansen
The politics and epistemology of the healing sciences in South Africa

2014 – Prof J Volmink
Reflections on the Social Determinants of Health Research Outputs

2015 – Prof H Klopper
Global trends in health care: Implications for research, education and policy

2016 – Prof B Morrow
Bridging the gap: Integrating research and clinical care in South Africa

2017 – Prof J Pettifor
Bone mass and fractures in South African children

Faculty of Health Sciences Faculty Research Forum 2018

ORGANIZING COMMITTEE

Chair:	Dr Wattie Janse van Rensburg
Vice chair:	Dr Nicholas Pearce
Dean:	Prof Gert van Zyl
Vice-Dean: Research:	Prof Joyce Tsoka-Gwegweni
Faculty Admin:	Ms Marlene Viljoen
Liaison Officer:	Ms Sandra Gouws
Research Admin:	Ms Lizelle de Reuck
School of Clinical Medicine:	Dr Nicholas Pearce
School of Pathology:	Ms Anneke van der Spoel van Dijk
School of Biomedical Sciences:	Dr Tonie Gerber
School for Allied Health Professions:	Prof Louise van den Berg
School of Nursing:	Dr Cynthia Spies
Laboratory:	Ms Anneke van der Spoel van Dijk
Clinical:	Dr Lincoln Solomon
Educational:	Mr Gerhard van Zyl
Student Forum Chair:	Dr Chantelle Liebenberg
Student Representatives:	Ms Saschke van der Merwe

EVALUATION COMMITTEES

CLINICAL

Internal Evaluation Committee:	Dr Lincoln Solomon (Chair) Prof Hanneke Brits Dr Shaun Maasdorp
External adjudicator:	Prof Andrew Argent, University of Cape Town
Adjudicators of research articles:	Prof Andrew Argent, University of Cape Town Prof Keertan Dheda – University of Cape Town Dr Indiran Govender – Sefako Makgatho Health Sciences University

LABORATORY

Internal Evaluation Committee:	Ms Anneke van der Spoel van Dijk (Chair) Dr Dominique Goedhals Dr Willie Shaw
External adjudicator:	Prof Grant Theron – Stellenbosch University
Adjudicators of research articles:	Prof Grant Theron – Stellenbosch University Prof Marlien Pieters – North-West University Prof Marleen Kock – University of Pretoria

EDUCATIONAL

Internal Evaluation Committee	Mr Gerhard van Zyl (Chair) Prof Louise van den Berg Ms Melanie Pienaar Dr Cynthia Spies
External adjudicator	Prof Francois Strydom – University of the Free State
Adjudicators of research articles:	Prof Francois Strydom – University of the Free State Dr Jeanette du Plessis – Central University of Technology Prof Adri Beylefeld – University of the Free State

Faculty of Health Sciences Faculty Research Forum 2018

PRIZE WINNERS OF RESEARCH ARTICLES

John van der Riet Medal Winner

M Pienaar, FC van Rooyen & CM Walsh
Department of Nutrition and Dietetics, School for Allied Health Professions
Household food security and HIV status in rural and urban communities in the Free State province, South Africa
Journal of Social Aspects of HIV/AIDS 14 (2017)

Muller Potgieter Medal Winner

FJ Burt, W Chen, JJ Miner, DJ Lenschow, A Merits, E Schnettler, A Kohl, PA Rudd, A Taylor, LJ Herrero, A Zaid, LFP Ng, S Mahalingam
Division of Virology, School of Pathology
Chikunguya virus: an update on the biology and pathogenesis of this emerging pathogen
The Lancet 16 (2017)

Kerneels Nel Medal Winner

C Marais, J Souse, G Poortier, A Fair, G Joubert & WJ Steinberg
Department of Family Medicine, School of Clinical Medicine
End-of-life practices: The opinions of undergraduate medical students at a South African university
South African Journal of Bioethics Law 10 (2017)

We express our sincere gratitude to the evaluation committees.

ACKNOWLEDGEMENTS

PARTICIPATING COMPANIES

We express our sincere thanks to the companies mentioned below for their financial support and valued participation in the 2018 Faculty of Health Sciences Faculty Research Forum of the University of the Free State.

DONORS

BRONZE
Life Rosepark Hospital
Busamed
SAMA
Partner4Life
Pathcare
3FScientic

SILVER
School of Nursing UFS

GOLD
None

PLATINUM
Faculty Management Committee, Faculty of Health Sciences
Prof C Witthuhn, Vice-Rector: Research, University of the Free State

EXHIBITORS

- Ampath
- Busamed Bram Fischer International Airport Hospital
- Discovery
- 3F Scientific Pty Ltd
- Life Rosepark Hospital
- Novagen
- Nostics
- PathCare
- Partner4Life
- SANBS
- South African Medical Association (SAMA)
- SSEM Mthembu Medical
- The Scientific Group
- Welch Allyn
- Whitehead Scientific

Programme

THURSDAY, 30 AUGUST 2018

	KINE 1		
SESSION 1 **08h00-08h30**	Chairperson: Dr Wattie Janse van Rensburg **Opening Lecture**: Prof GJ van Zyl (Dean: Faculty of Health Sciences)		
SESSION 2 **08h35-10h05**	**KINE 1**	**KINE 2**	**KINE 3**
	Chairperson: Prof N Mofolo **Clinical Papers**: CR 1 to 6	Chairperson: Prof CD Viljoen **Laboratory Papers**: LR 1 to 6	Chairperson: Dr D van Jaarsveldt **Educational Papers**: ER 1 to 6
08h35-08h50	CR1 Louise van Niekerk	LR1 Karl Sachse	ER1 Dirk Hagemeister
08h50-09h05	CR2 Willie Shaw	LR2 Gert Terblanch	ER2 Dirk Hagemeister
09h05-09h20	CR3 Edwin Turton	LR3 Elise Bonnet	ER3 Annamarie van Jaarsveld
09h20-09h35	CR4 Elitia Glover	LR4 Nicole Kennedy	ER4 Nokuthula Tlalajoe
09h35-09h50	CR5 Jacques Malherbe	LR5 Lourens Strauss	ER5 Maryna Hattingh
09h50-10h05	CR6 Maureen Conradie	LR6 Yuri Munsamy	ER6 Claire Barrett
TEA (10h05 – 10h15)			
	KINE 1		
SESSION 3 **10h15-10h45**	Chairperson: Dr Lincoln Solomon **Invitation Lecture**: Prof Andrew Argent *Research: lessons from Risky Business*		
SESSION 4 **10h50-13h05**	**KINE 1**	**KINE 2**	**KINE 3**
	Chairperson: Dr M Oberholzer **Clinical Papers**: KR 7 to 16	Chairperson: Dr MRB Maloba **Laboratory Papers**: LR 7 to 16	Chairperson: Prof M Mulder **Educational Papers**: ER 7 to 16
10h50-11h05	CR7 Elize Janse van Rensburg	LR7 Rethabile Maleka	ER7 Marius Pheiffer
11h05-11h20	CR8 Robyn Smith	LR8 Mia Moller	ER8 Angela Vorster
11h20-11h35	CR9 Robyn Smith	LR9 Johanet van Tonder	ER9 Lesley Talbot
11h35-11h50	CR10 Hilge du Preez	LR10 Natalie Viljoen	ER10 Monique de Milander
11h50-12h05	CR11 Abongile Matimba	LR11 Iqra Barakzai	ER11 Monique de Milander
12h05-12h20	CR12 Devesh Ramdhani	LR12 Sabeehah Vawda	ER12 Champion Nyoni
12h20-12h35	CR13 Tiaan Steyn	LR13 Jaco Joubert	ER13 Anja Botha
12h35-12h50	CR14 Andre Griesel	LR14 Elaine Botha	ER14 Lynette van der Merwe
12h50-13h05	CR15 Ermi Spies	LR15 Kholiwe Ntaita	ER15 Deirdre van Jaarsveldt
13h05-13h20	CR16 Yeishna Ramkillawan	LR16 Dorah Notani	
LUNCH (13H20-13H45)			

SESSION 5 **13h45-14h30**	**KINE 1**	
	Chairperson: Prof GJ van Zyl **FP Retief Lecture**: Prof Tahir Pillay *New diagnostic probes for laboratory medicine using nanobodies and next generation technology*	
	Chairperson: Dr Chantelle Liebenberg	
14h35-14h50	Best Student Paper	School of Allied Health Professions
14h50-15h05	Best Student Paper	School of Nursing
15h05-15h20	Best Student Paper	School of Medicine
TEA (15h20-15h35)		
SESSION 6 **15h35-16h40**	**KINE 1**	
	Chairperson: Dr N Pearce **Clinical Posters**: CP 1 to 4	
15h35-15h40	CP1 Heleen Nel	
15h40-15h45	CP2 Annelize Vorster	
15h45-15h50	CP3 Wattie Janse van Rensburg	
15h50-15h55	CP4 Milani Qebetu	
	Chairperson: Dr WJ Janse van Rensburg **Laboratory Posters**: LP 1 to 2	
15h55-16h00	LP1 Innocensia Mangoato	
16h00-16h05	LP2 Marius Coetzee	
	Chairperson: Prof S van Vuuren **Educational Posters**: EP 1 to 7	
16h05-16h10	EP1 Sesi Noge	
16h10-16h15	EP2 Chantel van Wyk	
16h15-16h20	EP3 Chantel van Wyk	
16h20-16h25	EP4 Chantel van Wyk	
16h25-16h30	EP5 Theanette Mulder	
16h30-16h35	EP6 Hanneke Brits	
16h35-16h40	EP7 Hanneke Brits	
SESSION 7 **16h45**	**KINE 1**	**KINE 2**
	Chairperson: Dr TRP Mofokeng **Clinical Papers:** KR 17 - 19	Chairperson: Prof MJ Coetzee **Laboratory Papers:** LR 17 to 19
16h45-17h00	CR17 Carina Vorster	LR17 Nerina van der Merwe
17h00-17h15	CR18 Laurence Grobbelaar	LR18 Willie Shaw
17h15-17h30	CR19 Lebohang Pitso	LR19 Tumelo Sekee

Programme
FRIDAY, 31 AUGUST 2018

	KINE 1	
SESSION 8 **08h00-08h30**	Chairperson: Mr Gerhard van Zyl **Invitation Lecture:** Professor Francois Strydom *"Redesigning universities using data".*	
SESSION 9 **08h35-10h35**	**KINE 1**	**KINE 2**
	Chairperson: Prof A Sherriff **Clinical Papers:** KR 20 - 27	Chairperson: Prof D Litthauer **Laboratory Papers:** LR 20 - 24
08h35-08h50	CR20 Jakes Möller	LR20 Mariska Roux
08h50-09h05	CR21 Richard Carter	LR21 Chantelle Booysen
09h05-09h20	CR22 Dedri O'Reilly	LR22 Chris Viljoen
09h20-09h35	CR23 Daleen van Jaarsveld	LR23 Thomas Tipih
09h35-09h50	CR24 Perry Loebenberg	
09h50-10h05	CR25 Febe Bruwer	
10h05-10h20	CR26 Corinna Walsh	
10h20-10h35	CR27 Corinna Walsh	
TEA/TEE (10h35-11h05)		
SESSION 10 **11h05-12h20**	**KINE 1**	**KINE 2**
	Chairperson: Dr LJ van der Merwe **Clinical Papers:** KR 28 - 31	Chairperson: Dr FCP du Plessis **Laboratory Papers:** LR 25 - 28
11h05-11h20	CR28 Marie Botes	LR24 Masingoaneng Mahloane
11h20-11h35	CR29 Nathaniel Mofolo	LR25 Anneke van der Spoel van Dijk
11h35-11h50	CR30 Louise van den Berg	LR26 Milton Mogotsi
11h50-12h05	CR31 Johannes Vorster	LR27 Michaella Morphis
12h05-12h20	CR32 Brenda Coetzee	
SESSION 11 **12h20-12h50**	**KINE 1**	
	Chairperson: Ms Anneke van der Spoel van Dijk **Invitation Lecture:** Prof Grant Theron *"The diagnosis of tuberculosis: challenging an ancient enemy with modern tools"*	
LUNCH (12h50-13h20)		

SESSION 12 **13h30 – 14h15**	**KINE 1**	
	Chairperson: Prof Joyce Tsoka-Gwegweni **Reflections**: External Evaluators	
13h30-13h45	Reflection Clinical External Adjudicator	Prof Andrew Argent
13h45-14h00	Reflection Educational External Adjudicator	Prof Francois Strydom
14h00-14h15	Reflection Laboratory External Adjudicator	Prof Grant Theron
CLOSURE		
	FOYER	
16H00	**Announcement of Winners** **IMPORTANT NOTICE:** **All persons** who present papers during the Forum must assemble in the Foyer directly after the conclusion of Friday's programme for the announcement of the winners and handing over of prizes during a cocktail function.	

Programme
THURSDAY, 30 AUGUST 2018

Session 2 **KINE 1** **CR1 MODERN AUTORADIOGRAPHY METHODS FOR HDR BRACHYTHERAPY REVEAL STARTLING RESULTS**

08h35-08h50 Presenter: Louise van Niekerk
Authors: L van Niekerk, LJ Strauss, W Shaw
Department: Medical Physics

Session 2 **KINE 1** **CR2 STEREOTACTIC RADIOSURGERY WITH MODERN LINEAR ACCELERATORS: NOT JUST AN ALTERNATIVE ANYMORE**

08h50-09h05 Presenter: Willie Shaw
Authors: W Shae
Department: Medical Physics

Session 2 **KINE 1** **CR3 CONGENITAL HEART DEFECTS IN CHILDREN WITH CLEFT LIPS AND/OR PALATES AT AN ACADEMIC HOSPITAL IN CENTRAL SOUTH AFRICA**

09h05-09h20 Presenter: Edwin Turton
Authors: WJ Barrett, BJS Diedericks, CL Barrett, G Joubert, EW Turton
Department: Anaesthesiology

Session 2 **KINE 1** **CR4 THE PROFILE OF MICROORGANISMS AND ANTIMICROBIAL SUSCEPTIBILITY ASSOCIATED WITH NEUTROPENIC FEVER IN PATIENTS WITH HEMATOLOGICAL DISORDERS AT UNIVERSITAS HOSPITAL.**

09h20-09h35 Presenter: Elitia Glover
Authors: E Glover, S Potgieter, CL Barrett, G Joubert
Department: Internal Medicine, Biostatistics

Session 2 **KINE 1** **CR5 CHRONIC MYELOID LEUKEMIA AT UNIVERSITAS ACADEMIC HOSPITAL. ARE WE REACHING THE TARGETS ACCORDING TO THE EUROPEAN LEUKEMIANET GUIDELINES?**

09h35-09h50 Presenter: Jacques Malherbe
Authors: JLeR Malherbe, TB Sikhipa, CD Viljoen, G Joubert, CL Barrett, S Dhar
Department: Internal Medicine, GMO Unit, Haematology and Cell Biology, Biostatistics

Session 2 **KINE 1** **CR6 PREVENTABLE WARFARIN-INDUCED BIRTH DEFECTS: A MISSED OPPORTUNITY?**

09h50-10h05 Presenter: Maureen Conradie
Authors: M Conradie, C van Wyk, BD Henderson
Department: Neurology, Health Sciences Education

Session 2 **KINE 2** **LR1 MODELLING OF ELECTRON BEAMS PRODUCED BY A MEDICAL LINEAR ACCELERATOR**

08h35-08h50 Presenter: Karl Sachse
Authors: KN Sachse, FCP du Plessis
Department: Medical Physics

Session 2 **KINE 2** **LR2 IDENTIFICATION OF ARBOVIRUSES CIRCULATING IN MOSQUITO POPULATIONS IN THE BLOEMFONTEIN AREA: MOSQUITO IDENTIFICATION AND METEOROLOGICAL DATA.**

08h50-09h05 Presenter: Gert Terblanche
Authors: GIduP Terblanche, A Kemp, FJ Burt
Department: Virology, Institute for Communicable Diseases, NHLS

Session 2 **KINE 2** **LR3 THE DEVELOPMENT AND VALIDATION OF A REVERSE TRANSCRIPTION RECOMBINASE POLYMERASE AMPLIFICATION ASSAY FOR DETECTION OF FLAVIVIRUSES IN SOUTH AFRICA.**

09h05-09h20 Presenter: Elise Bonnet
Authors: EH Bonnet, FJ Burt
Department: Virology

Session 2 **KINE 2** **LR4 PREVALENCE OF SINDBIS VIRUS INFECTIONS IN THE FREE STATE**

09h20-09h35 Presenter: Nicole Kennedy
Authors: N Kennedy, D Goedhals, FJ Burt
Department: Virology

Session 2 **KINE 2** **LR5 RADIOTHERAPY TREATMENT VERIFICATION: LOGFILES AS AN ALTERNATIVE TO MEASUREMENTS**

09h35-09h50 Presenter: Lourens Strauss
Authors: LJ Strauss, A van Eck, W Shaw
Department: Medical Physics, High Performance Computing Unit

Session 2 **KINE 2** **LR6 COMPLETE GENOME SEQUENCE AND COMPARATIVE ANALYSIS OF HUMAN PAPILLOMAVIRUS TYPE 18 ISOLATED FROM A HEAD AND NECK CANCER BIOPSY**

09h50-10h05 Presenter: Yuri Munsamy
Authors: Y Munsamy, RY Seedat, PA Bester, FJ Burt
Department: Virology, Otorhinolaryngology, NHLS

Session 2 **KINE 3** **ER1 EMPLOYER-GENERATED COMPLAINTS TO THE STATUTORY REGISTRATION AUTHORITY - A BRIEF REVIEW OF THE REGULATORY FRAMEWORK FOR THE SUPERVISION OF EMPLOYED HEALTH PROFESSIONALS IN THE SOUTH AFRICAN PUBLIC SECTOR**

08h35-08h50 Presenter: Dirk Hagemeisster
Authors: DT Hagemeister
Department: Family Medicine

Session 2 **KINE 3** **ER2 NOMINAL-GROUP-TECHNIQUE REVIEW OF THE EMERGENCY CARE CONTENT OF THE 3RD YEAR CLINICAL SKILLS MODULE (MCLI3713) IN THE UNDERGRADUATE MEDICAL PROGRAMME AT THE UNIVERSITY OF THE FREE STATE**

08h50-09h05 Presenter: Dirk Hagemeister
Authors: DT Hagemeister
Department: Family Medicine, Health Science Education

Session 2 **KINE 3** **ER3 USING EDUCATIONAL DESIGN RESEARCH TO DESIGN A CURRICULUM FOR A PROFESSIONAL OCCUPATIONAL THERAPY MASTER'S DEGREE IN THE FIELD OF SENSORY INTEGRATION**

09h05-09h20 Presenter: Annamarie van Jaarsveld
Authors: A van Jaarsveld, N Scheepers, S van Vuuren, J Raubenheimer
Department: Occupational Therapy, School of Higher Education Studies, Biostatistics

Session 2 **KINE 3** **ER4 MULTIPLE TRANSITIONS OF UNDERGRADUATE FIRST-YEAR STUDENTS IN THE MBCHB PROGRAMME: EXPECTATIONS, EXPERIENCES AND EMOTIONS**

09h20-09h35 Presenter: Nokuthula Tlalajoe
Authors: N Tlalajoe, MP Jama
Department: Student Learning and Development

Session 2 **KINE 3** **ER5 THE ETHICAL ASPECTS OF PEER PHYSICAL EXAMINATION (PPE)**
09h35-09h50 Presenter: Maryna Hattingh
Authors: MGM Hattingh
Department: Clinical Simulation and Skills Unit: School of Medicine

Session 2 **KINE 3** **ER6 INSTITUTIONAL CAPACITY DEVELOPMENT IN THE START-UP OF A LARGE COHORT CARDIOVASCULAR / HIV STUDY. A SWOT ANALYSIS.**
09h50-10h05 Presenter: Claire Barrett
Authors: CL Barrett, WF Mollentze, AM van Staden, TRP Mofokeng, D Steyn, GM Marx,
R Nhiwatiwa, KG Tsie, WJ Janse van Rensburg, J Dave
Department: Internal Medicine (UFS), Department of Genetics (UFS), Farmovs (UFS), GMO Unit, Department of Haematology and Cell Biology (UFS), Internal Medicine (UCT)

Session 4 **KINE 1** **CR7 COMPUTERIZED ASSESSMENT OF EYE TRACKING TO ENHANCE CLINICAL OBSERVATIONS IN OCCUPATIONAL THERAPY**
10h50-11h05 Presenter: Elize Janse van Rensburg
Authors: E Janse van Rensburg, P Blignaut, M Oberholzer
Department: Occupational Therapy, Computer Science and Informatics, Optometry

Session 4 **KINE 1** **CR8 PREOPERATIVE NEURODEVELOPMENTAL ASSESSMENTS IN YOUNG CHILDREN UNDERGOING CARDIAC SURGERY IN CENTRAL SOUTH AFRICA: FEASIBILITY AND CLINICAL VALUE**
11h05-11h20 Presenter: Robyn smith
Authors: R Smith, J Potterton, V Ntsiea, S Brown
Department: Physiotherapy, Wits; Paediatrics and Child Health, UFS

Session 4 **KINE 1** **CR9 OUTCOMES OF CHILDREN WITH DOWN SYNDROME AND CONGENITAL HEART DISEASE UNDERGOING CARDIAC SURGERY IN CENTRAL SOUTH AFRICA**
11h20-11h35 Presenter: Robyn Smith
Authors: R Smith, J Potterton, V Ntsiea, S Brown
Department: Physiotherapy, Wits; Paediatrics and Child Health, UFS

Session 4 **KINE 1** **CR10 THE PROFILE AND OUTCOME OF SMALL BOWEL ATRESIA AT UNIVERSITAS ACADEMIC HOSPITAL**
11h35-11h50 Presenter: Hilge du Preez
Authors: H du Preez, E Brits
Department: Surgery

Session 4 **KINE 1** **CR11 LARYNGEAL TUBERCULOSIS AT UNIVERSITAS ACADEMIC HOSPITAL, BLOEMFONTEIN**
11h50-12h05 Presenter: Abongile Matimba
Authors: A Matimba, RY Seedat, M Moncho, J Musoke, M Mamba
Department: Otorhinolaryngology, Medical Microbiology & Biostatistics

Session 4 **KINE 1** **CR12 QUALITY OF LIFE ASSESSMENT IN PATIENTS WITH ALLERGIC RHINITIS**
12h05-12h20 Presenter: Devesh Ramdhani
Authors: D Ramdhani, RY Seedat, T Daniller
Department: Otorhinolaryngology

Session 4 **KINE 1** **CR13 COST ANALYSIS OF VIOLENCE-RELATED MEDICAL IMAGING IN A FREE STATE TERTIARY TRAUMA UNIT**
12h20-12h35 Presenter: Tiaan Steyn
Authors: TP Steyn, F Gebremariam
Department: Clinical Imaging Sciences

Session 4 **KINE 1** **CR14 THE EFFECT OF ORAL SODIUM BICARBONATE ON THE FREQUENCY OF ACUTE GOUT ATTACKS AND SERUM URIC ACID LEVELS IN PATIENTS WITH CHRONIC UNCONTROLLED GOUT. A DOUBLE BLIND RANDOMIZED PLACEBO-CONTROLLED TRIAL.**

12h35-12h50 Presenter: André Griesel
Authors: A Griesel, WF Mollentze, BJ Jansen van Rensburg, FC van Rooyen, M Havinga
Department: Internal Medicine, Rheumatology

Session 4 **KINE 1** **CR15 KNOWLEDGE, ATTITUDE AND PRACTICES OF PATIENTS RECEIVING MAINTENANCE HEMODIALYSIS IN BLOEMFONTEIN, SOUTH AFRICA**

12h50-13h05 Presenter: Ermi Spies
Authors: HC Spies, VL vd Berg, M Nel
Department: Nutrition and Dietetics, Biostatistics

Session 4 **KINE 1** **CR16 ASSESSMENT OF METERED DOSE INHALER TECHNIQUE, PERFORMED AT THE PULMONOLOGY CLINIC AT A TERTIARY HOSPITAL IN THE FREE STATE, SOUTH AFRICA**

13h05-13h20 Presenter: Yeishna Ramkillawan
Authors: Y Ramkillawan, RY Seedat, M Prins
Department: Pulmonology, Otorhinolaryngology

Session 4 **KINE 2** **LR7 VALIDATION OF A RAPID VON WILLEBRAND FACTOR PROPEPTIDE ASSAY**

10h50-11h05 Presenter: Rethabile Maleka
Authors: RB Maleka, SM Meiring
Department: Haematology and Cell Biology

Session 4 **KINE 2** **LR8 EVALUATION OF IMAGE QUALITY AND DOSE IN MAMMOGRAPHY USING CENTRAL COMPOSITE DESIGN**

11h05-11h20 Presenter: Mia Moller
Authors: M Moller, S Acho
Department: Medical Physics

Session 4 **KINE 2** **LR9 ESTABLISHMENT OF RADIOCHROMIC FILM CALIBRATION CURVES FOR RADIONUCLIDES IN NUCLEAR MEDICINE.**

11h20-11h35 Presenter: Johanet van Tonder
Authors: J van Tonder, EC Botha, K Ramonaheng
Department: Medical Physics

Session 4 **KINE 2** **LR10 NON-STRUCTURAL CRIMEAN-CONGO HAEMORRHAGIC FEVER VIRUS PROTEIN PREVENTS IMMUNE ACTIVATION**

11h35-11h50 Presenter: Natalie Viljoen
Authors: N Viljoen, D Goedhals, FJ Burt
Department: Virology, NHLS

Session 4 **KINE 2** **LR11 DEVELOPMENT AND VALIDATION OF AN HIV DRUG RESISTANCE ASSAY USING DRIED BLOOD SPOT SAMPLES**

11h50-12h05 Presenter: Iqra Barakzai
Authors: I Barakzai, PA Bester, J Frater, D Goedhals
Department: Virology, NHLS, Nuffield Department of Clinical Medicine, University of Oxford

Session 4 **KINE 2** **LR12 SEROEPIDEMIOLOGIC SURVEY OF CRIMEAN-CONGO HEMORRHAGIC FEVER VIRUS IN SELECTED RISK GROUPS, SOUTH AFRICA**

12h05-12h20 Presenter: Sabeehah Vawda
Authors: S Vawda, D Goedhals, PA Bester, F Burt
Department: Virology, NHLS

Session 4 **KINE 2** **LR13 THE IN VIVO EFFECTS OF HIGH-DOSE STREPTOKINASE IN A PAPIO URSINUS BABOON MODEL OF ACQUIRED THROMBOTIC THROMBOCYTOPENIC PURPURA.**

12h20-12h35 Presenter: Jaco Joubert
Authors: J Joubert, WJ Janse van Rensburg, C Conradie, S Lamprecht, SM Meiring
Department: Haematology and Cell Biology, National Health Laboratory Service, Universitas Academic Laboratories, Animal Experimentation Unit.

Session 4 **KINE 2** **LR14 ASSESSMENT OF GAMMA CAMERA CALIBRATION FACTORS FOR QUANTIFICATION OF NUCLEAR MEDICINE IMAGES**

12h35-12h50 Presenter: Elaine Botha
Authors: EC Botha, K Ramonaheng, J van Tonder
Department: Medical Physics

Session 4 **KINE 2** **LR15 THE CONTRIBUTION OF LARGER REARRANGEMENTS IN BRCA1/2 TO FAMILIAL BREAST CANCER IN SOUTH AFRICA.**

12h50-13h05 Presenter: Kholiwe Ntaita
Authors: KS Ntaita, J Oosthuizen, M Theron, NC van der Merwe
Department: Human Genetics

Session 4 **KINE 2** **LR16 SCREENING FOR MUTATIONS IN BRCA2 REVEAL BIALLELIC PATHOGENIC MUTATIONS FOR TWO FANCONI ANEMIA BABIES: A CASE STUDY.**

13h05-13h20 Presenter: Dorah Notani
Authors: D Notani, J Oosthuizen, M Theron, NC van der Merwe
Department: Human Genetics

Session 4 **KINE 3** **ER7 A CRITICAL ANALYSIS OF THE MULTIPLE-CHOICE QUESTION BANK FOR UNDERGRADUATE MEDICAL STUDENTS IN ANAESTHESIOLOGY AT THE UNIVERSITY OF THE FREE STATE**

10h50-11h05 Presenter: Marius Pheiffer
Authors: LM Pheiffer, CL Odendaal, FHS Schoeman
Department: Anaesthesiology

Session 4 **KINE 3** **ER8 THE PSYCHOLOGICAL IMPACT OF PROVIDING THE FETICIDE PROCEDURE: HEALTH SERVICE PROVIDERS' EXPERIENCES.**

11h05-11h20 Presenter: Angela Vorster
Authors: AC Vorster, C Macleod
Department: Undergraduate Programme Management, Rhodes University
Critical Studies in Sexualities and Reproduction (Research Unit)

Session 4 **KINE 3** **ER9 PRESENCE OF HEALTH DIALOGUE ELEMENTS DURING COMMUNICATION BETWEEN PATIENTS AND NURSES**

11h20-11h35 Presenter: Lesley Talbot
Authors: LJ Talbot, M Reid, M Nel
Department: School of Nursing, Biostatistics

Session 4 **KINE 3** **ER10 THE USEFULLNESS OF THE MOVEMENT ABC-2 CHECKLIST AND DEVELOPMENTAL COORDINATION DISORDER QUESTIONNAIRE'07 FOR PARENTS' AS SCREENING TOOLS TO IDENTIFY DEVELOPMENTAL COORDINATION DISORDER IN GRADE 1 LEARNERS**

11h35-11h50 Presenter: Monique de Milander
Authors: M de Milander, AM du Plessis, FF Coetzee
Department: Exercise and Sport Sciences

Session 4 **KINE 3** **ER11 IDENTIFICATION OF DEVELOPMENTAL COORDINATION DISORDER (DCD) IN GRADE 1 LEARNERS: A SCREENING TOOL FOR PARENTS AND TEACHERS**

11h50-12h05 Presenter: Monique de Milander
Authors: M de Milander, AM du Plessis, FF Coetzee
Department: Exercise and Sport Sciences

Session 4 **KINE 3** **ER12 IMPLEMENTING OF A COMPETENCY-BASED MIDWIFERY PROGRAMME IN LESOTHO: A GAP ANALYSIS**

12h05-12h20 Presenter: Champion Nyoni
Authors: CN Nyoni, Y Botma
Department: School of Nursing

Session 4 **KINE 3** **ER13 UNDERGRADUATE MEDICAL STUDENTS'; PERCEPTIONS OF RESILIENCE**

12h20-12h35 Presenter: Anja Botha
Authors: A Botha, LJ Van der Merwe
Department: Psychology, Programme Director, School of Medicine

Session 4 **KINE 3** **ER14 ARE UFS MEDICAL STUDENTS SUFFERING FROM BURNOUT?**

12h35-12hh50 Presenter: Lynette Van der Merwe
Authors: LJ Van der Merwe LJ, A Botha, G Joubert
Department: Undergraduate medical programme management, Psychology, Biostatistics

Session 4 **KINE 3** **ER15 BREAKING NEW GROUND: ESTABLISHING AN ACADEMY FOR CONTINUING NURSING EDUCATION**

12h50-13h05 Presenter: Deirdre van Jaarsveldt
Authors: DE van Jaarsveldt, A Joubert
Department: School of Nursing

Session 6 **KINE 1** **CP1 THE ACCESSIBILITY OF SECONDARY SCHOOLS FOR LEARNERS WITH MOBILITY LIMITATIONS.**

15h35-15h40 Presenter: Heleen Nel
Authors: HW Nel, R Smith, S Crafford, M de Bruyn, A de Lange, H Oosthuizen, J van Zyl, M Venter, L Vermaak
Department: Physiotherapy

Session 6 **KINE 1** **CP2 SECOND- AND THIRD-YEAR MEDICAL STUDENTS' SELF-REPORTED ALCOHOL- AND SUBSTANCE USE AND SMOKING HABITS AT A SOUTH AFRICAN MEDICAL SCHOOL.**

15h40-45h45 Presenter: Annelize Vorster
Authors: AM Gerber, A Vorster, LJ van der Merwe, S van Zyl
Department: Basic Medical Sciences, Undergraduate Programme Director

Session 6 **KINE 1** **CP3 LIFESTYLE CHANGE ALONE SUFFICIENT TO LOWER CHOLESTEROL IN MALE PATIENT WITH MODERATELY ELEVATED CHOLESTEROL – A CASE REPORT**

15h45-15h50 Presenter: Wattie Janse van Rensburg
Authors: WJ Janse van Rensburg
Department: Human Molecular Biology Unit, Department of Haematology and Cell Biology

Session 6 **KINE 1** **CP4 VALIDATION OF A GAMMA CAMERA MODELLED WITH SIMIND MONTE CARLO CODE**

15h50-15h55 Presenter: Milani Qebetu
Authors: M Qebetu, J Van Staden, H Du Raan, K Ramonaheng
Department: Medical Physics

Session 6 **KINE 1** **LP1 CANNABIS SATIVA L. AERIAL PLANT PARTS EXTRACTS REVERSE DRUG RESISTANCE IN LS513 MDR COLON CANCER CELLS IN VITRO**

15h55-16h00 Presenter: Innocensia Mangoato
Authors: I Mangoato, CP Mahadevappa, MG Matsabisa
Department: Pharmacology

Session 6	**KINE 1**	**LP2 MUTATION DETECTION IN THE ENDOGLIN GENE IN A FAMILY WITH HEREDITARY HAEMORRHAGIC TELANGIECTASIA (HHT)**
	16h00-16h05	Presenter: Marius Coetzee **Authors**: KT Peta, MJ Coetzee, G Marx **Department**: Genetics, Natural and Agricultural Sciences; Haematology and Cell Biology
Session 6	**KINE 1**	**EP1 STRATEGIES TO REDUCE STILLBIRTHS IN THE FEZILE DABI DISTRICT, SOUTH AFRICA**
	16h05-16h10	Presenter: Sesi Noge **Authors**: SR Noge **Department**: School of Nursing
Session 6	**KINE 1**	**EP2 PERSPECTIVES OF ACADEMIC STAFF ON THE ROLES OF THE NEWLY APPOINTED TEACHER IN HEALTH SCIENCES**
	16h10-16h15	Presenter: Chantel van Wyk **Authors**: C van Wyk, MM Nel, GJ van Zyl **Department**: Division Health Sciences Education, Office of the Dean, FoHS
Session 6	**KINE 1**	**EP3 ASSESSMENT OR ASSASSINATION? PHARMACY STUDENTS' OPINIONS REGARDING THE CAUSES OF THEIR ASSESSMENT ANXIETY AND POOR ACADEMIC PERFORMANCE.**
	16h15-16h20	Presenter: Chantel van Wyk **Authors**: CS Mostert, C van Wyk **Department**: Health Sciences Education
Session 6	**KINE 1**	**EP4 CONTINUOUS PROFESSIONAL DEVELOPMENT ECHOCARDIOGRAPHY TRAINING IN SOUTH AFRICA**
	16h20-16h25	Presenter: Chantel van Wyk **Authors**: M van Schalkwyk, Chantel van Wyk **Department**: Health Sciences Education
Session 6	**KINE 1**	**EP5 MANUSCRIPTS FINALISED FOR JOURNAL SUBMISSION BY THE UNIVERSITY OF THE FREE STATE SCHOOL OF MEDICINE MEDICAL EDITOR: JOURNAL RESPONSE TYPES AND TIMES**
	16h25-16h30	Presenter: Theanette Mulder **Authors**: G Joubert, T Mulder, WJS Steinberg, J Botes **Department**: Biostatistics, Family Medicine
Session 6	**KINE 1**	**EP6 #FEESMUSTFALL2016: THE PERCEIVED AND MEASURED EFFECT ON CLINICAL MEDICAL STUDENTS**
	16h30-16h35	Presenter: Hanneke Brits **Authors**: H Brits, G Joubert, L Lomberg, P Djan, G Makoro, M Mokoena, P Malate, D Tengu **Department**: Family Medicine, Biostatistics
Session 6	**KINE 1**	**EP7 HOW RELIABLE IS OUR MMED(FAM MED) OSCE ASSESSMENT?**
	16h35-16h40	Presenter: Hanneke Brits **Authors**: H Brits, G Joubert **Department**: Family Medicine, Biostatistics

Session 7	**KINE 1**	**CR17 CONTROVERSY REGARDING DA VINCI'S GUT FEELING.**
	16h45-17h00	Presenter: Carina Vorster **Authors**: C Vorster, A Nel **Department**: Basic Medical Sciences
Session 7	**KINE 1**	**CR18 HYPOPHOSPHATEMIA AFTER CARDIOPULMONARY BYPASS – INCIDENCE AND CLINICAL SIGNIFICANCE, A SOUTH AFRICAN PERSPECTIVE**
	17h00-17h15	Presenter: Laurence Grobbelaar **Authors**: LE Grobbelaar, LE Grobbelaar, G Joubert, BJS Diedericks **Department**: Anaesthesiology, Biostatitstics
Session 7	**KINE 1**	**CR19 PREVALENCE OF ISONIAZID RESISTANCE-CONFERRING MUTATIONS ASSOCIATED WITH MULTI-DRUG RESISTANT TUBERCULOSIS IN THE FREE STATE PROVINCE, SOUTH AFRICA**
	17h15-17h30	Presenter: Lebohang Pitso **Authors**: L Pitso, S Potgieter, A Van Der Spoel Van Dijk **Department**: Internal Medicine; Medical Microbiology
Session 7	**KINE 2**	**LR17 VARIANT CLASSIFICATION: A DAUNTING TASK**
	16h45-17h00	Presenter: Nerina van der Merwe **Authors**: NC van der Merwe, M Theron, J Oosthuizen **Department**: Human Genetics
Session 7	**KINE 2**	**LR18 RESERVE STEM CELL POPULATION IN INTESTINAL CRYPTS FOUND TO BE CONSISTENTLY SMALL BY ANALYSIS OF IN VIVO CLONOGENIC ASSAYS WITH A BIOMATHEMATICAL DYNAMIC MODEL**
	17h00-17h15	Presenter: Willie Shaw **Authors**: W Shaw, E Bahn, M van Heerden, J Gueulette, J P Slabbert, J Debus, M Alber **Department**: Medical Physics UFS; Radiation Oncology and Radiation Therapy, Heidelberg; Radiobiology Laboratory,Brussels; iThemba LABS, Somerset West
Session 7	**KINE 2**	**LR19 SURVEILLANCE OF WILD CAUGHT BIRDS FOR FLAVIVIRUS INFECTIONS IN THE LOWVELD REGION OF SOUTH AFRICA.**
	17h15-17h30	Presenter: Tumelo Sekee **Authors**: TR Sekee, M Ndlovu, AD Perez-Rodriguez, E Bonnet, FJ Burt **Department**: Virology, Zoology and Entomology, School of Biology and Environmental sciences, University of Mpumalanga, National Health Laboratory Services

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Session 9	**KINE 1**	**CR20 INTEROBSERVER VARIABILITY INFLUENCES THE LUGANO CLASSIFICATION WHEN RESTAGING LYMPHOMA**
	08h35-08h50	Presenter: Jakes Möller **Authors**: JS Möller, T Steyn, N Combrinck, G Joubert, A Sherriff, J Janse van Rensburg **Department**: Clinical Imaging Sciences, Biostatistics, Oncology
Session 9	**KINE 1**	**CR21 CONTROL OF RHEUMATOID ARTHRITIS AT RHEUMATOLOGY OUTPATIENT DEPARTMENT OF UNIVERSITAS HOSPITAL, BLOEMFONTEIN**
	08h50-09h05	Presenter: Richard Carter **Authors**: RMN Carter, BJ Jansen van Rensburg, G Joubert **Department**: Internal Medicine, Rheumatology, Biostatistics
Session 9	**KINE 1**	**CR22 UNCERTAINTIES IN THE CERTAINTY OF ADVANCED RADIOTHERAPY FOR CERVICAL CANCERv**
	09h05-09h20	Presenter: Dedri O'Reilly **Authors**: FHJ O'Reilly, L Strauss, W Shaw **Department**: Medical Physics
Session 9	**KINE 1**	**CR23 A SYSTEMATIC REVIEW OF LITERATURE TO EVALUATE THE BURDEN AND MANAGEMENT OF PHYSICAL AND PSYCHOLOGICAL SYMPTOMS IN PATIENTS DIAGNOSED WITH IDIOPATHIC PULMONARY FIBROSIS.**
	09h20-09h35	Presenter: Daleen van Jaarsveld **Authors**: MF van Jaarsveld, L Gwyther **Department**: Palliative Care UCT, Internal Medicine UFS
Session 9	**KINE 1**	**CR24 HIV RELATED BURKITT LYMPHOMA IN THE FREE STATE, SOUTH AFRICA: A RETROSPECTIVE COMPARISON OF CLINICAL EXPERIENCE AND OUTCOMES USING SC-EPOCH-RR AND HYPER-CVAD CHEMOTHERAPY FROM 2010 – 2015**
	09h35-09h50	Presenter: Perry Loebenberg **Authors**: P Loebenberg, J Malherbe **Department**: Internal Medicine
Session 9	**KINE 1**	**CR25 VENOUS ULCER CARE IN WOUND CARE PRACTICES IN GAUTENG**
	09h50-10h05	Presenter: Febe Bruwer **Authors**: F Bruwer, Y Botma, M Mulder, C Grobler **Department**: School of Nursing
Session 9	**KINE 1**	**CR26 HIV TREATMENT IS ASSOCIATED WITH A TWOFOLD HIGHER PROBABILITY OF RAISED TRIGLYCERIDES: POOLED ANALYSES IN 21 023 INDIVIDUALS IN SUB-SAHARAN AFRICA**
	10h05-10h20	Presenter: Corinna Walsh **Authors**: C Walsh (on behalf of the African Partnership for Chronic Disease Research (APCDR)) **Department**: Nutrition and Dietetics
Session 9	**KINE 1**	**CR27 STUNTING AT BIRTH AND AT 6 WEEKS IN THE NORTHERN CAPE PROVINCE**
	10h20-10h35	Presenter: Corinna Walsh **Authors**: M le Roux, C Walsh and MM Nel **Department**: Nutrition and Dietetics, Biostatistics

Session 9 **KINE 2** **LR20 AN UPDATE AND EXPANSION OF THE FREE STATE AND NORTHERN CAPE INHERITED BLEEDING DISORDER REGISTRY**

08h35-08h50 Presenter: Mariska Roux
Authors: MS Roux, MJ Coetzee, J Joubert
Department: Haematology and Cell Biology

Session 9 **KINE 2** **LR21 DNA EXTRACTION: THE DEVIL IS IN THE DETAIL**

08h50-09h05 Presenter: Chantelle Booysen
Authors: C Booysen, CD Viljoen
Department: GMO Unit

Session 9 **KINE 2** **LR22 DNA QUANTIFICATION: THE GOOD AND THE BAD**

09h05-09h20 Presenter: Chris Viljoen
Authors: CD Viljoen, C Booysen
Department: GMO Unit

Session 9 **KINE 2** **LR23 IMMUNOGENICITY OF SINDBIS BASED REPLICONS FOR CRIMEAN-CONGO HEMORRHAGIC FEVER VIRUS**

09h20-09h35 Presenter: Thomas Tipih
Authors: T Tipih, FJ Burt
Department: Virology

Session 10 **KINE 1** **CR28 COMPARISON OF THREE DIFFERENT PLANNING APPROACHES FOR CERVICAL HIGH DOSE RATE BRACHYTHERAPY**

11h05-11h20 Presenter: Mari Botes
Authors: M Botes, W Shaw, LJ Strauss
Department: Medical Physics

Session 10 **KINE 1** **CR29 KNOWLEDGE OF CERVICAL CANCER, HUMAN PAPILLOMAVIRUS AND PREVENTION AMONG FIRST-YEAR FEMALE STUDENTS IN RESIDENCES AT THE UNIVERSITY OF THE FREE STATE**

11h20-11h35 Presenter: Nathaniel Mofolo
Authors: N Mofolo, M Sello, M Leselo, N Chabanku, S Ndlovu, Q Naidoo, G Joubert
Department: School of Clinical Medicine

Session 10 **KINE 1** **CR30 ADEQUACY OF ORAL ENERGY AND PROTEIN INTAKE IN A PRIVATE INTENSIVE CARE UNIT**

11h35-11h50 Presenter: Louise van den Berg
Authors: VL van den Berg, A Kloppers, VL van den Berg, M Nel
Department: Nutrition and Dietetics, Biostatistics

Session 10 **KINE 1** **CR31 INTRAVENOUS LIGNOCAINE FOR PERIOPERATIVE ANALGESIA – A SYSTEMATIC REVIEW IDENTIFYING CURRENT APPLICATIONS AND FUTURE POTENTIAL.**

11h50-12h05 Presenter: Johannes Vorster
Authors: JG Vorster, BJS Diedericks
Department: Anaesthesiology

Session 10 **KINE 1** **CR32 PREDICTING PHYSICAL EXERTION ON GRADED HIKING TRAILS**

12h05-12h20 Presenter: Brenda Coetzee
Authors: B Coetzee
Department: Exercise and Sports Science

Session 10	**KINE 2**	**LR24 MOLECULAR CHARACTERISATION AND PREVALENCE OF TUBERCULOSIS IN ADOLESCENTS IN THE FREE STATE, JANUARY 2016 – JUNE 2017.**
	11h05-11h20	Presenter: Masingoaneng Mahloane **Authors**: C Butcher, M Mahloane, J Musoke, Y Coovadia, A Van der Spoel van Dijk **Department**: Universitas Academic Laboratory, NHLS, Medical Microbiology
Session 10	**KINE 2**	**LR25 WHOLE GENOME SEQUENCING A TOOL TO ASSIST IN THE MANAGEMENT OF COMPLICATED TB CASES**
	11h20-11h35	Presenter: Anneke van der Spoel van Dijk **Authors**: A van der Spoel van Dijk, UM Hallbauer, M Nyaga, K Baba, J Musoke, Y Coovadia **Department**: Universitas Academic Laboratory, National Health Laboratory Service
Session 10	**KINE 2**	**LR26 GENOMIC INVESTIGATION OF THE FAECAL RNA VIROME IN CHILDREN FROM OUKASIE CLINIC, NORTH WEST PROVINCE, SOUTH AFRICA**
	11h35-11h50	Presenter: Milton Mogotsi **Authors**: MT Mogotsi, PN Mwangi, LB Mosime, SP Rasebotsa, PA Bester, HG O'Neill, MM Nyaga **Department**: Next Generation Sequencing Unit, Medical Virology
Session 10	**KINE 2**	**LR27 OPTIMIZATION OF IMAGE PROCESS PARAMETERS IN DIGITAL MAMMOGRAPHY USING THE TAGUCHI METHOD**
	11h50-12h05	Presenter: Michaella Morphis **Authors**: M Morphis, S Acho **Department**: Medical Physics

INSTRUCTIONS TO PRESENTERS

1. The author whose name is underlined in the abstract delivers the presentation.

2. A paper lasts 15 minutes (including 5 minutes for questions), and a poster session lasts 4 minutes (including 2 minutes for questions). In order to give everyone a fair opportunity, we kindly request presenters to adhere strictly to the set times.

3. Facilities for electronic data projection are available. In view of time constraints, we kindly request presenters to load their presentations onto the computer network well in advance.

4. The poster exhibition is on display in the marble foyer of the F.P. Retief Building for viewing from Wednesday to Friday.

5. A friendly reminder: All winners will be announced at the last session of the Forum, Friday afternoon at 16h00.

Dr WJ Janse van Rensburg
Chairperson: Organising Committee

CLINICAL PAPERS

CR -1

Title: **MODERN AUTORADIOGRAPHY METHODS FOR HDR BRACHYTHERAPY REVEAL STARTLING RESULTS**

Authors: L van Niekerk, LJ Strauss, W Shaw
Department: Medical Physics
Presenter: Louise van Niekerk

Introduction and aim: Modern HDR brachytherapy treatment planning systems (TPS) include libraries of applicators for reconstruction to perform quick treatment planning. Library applicators and reconstruction methods supposedly ensure source position conformity on the patient image dataset, while autoradiography tests this conformance. Nowadays, historic autoradiography is mostly inaccessible while modern applicators don't lend themselves to these techniques. We explore more contemporary alternatives to autoradiography.
Materials and Methods: The dwell positions of the HDR source in various applicators were assessed. Applicators were fixed to a 2D-array detector and imaged with dummy sources loaded. A 2D image of the setup was acquired and used to determine the coordinates of the dummy sources, while source dwell positions were selected on the TPS to coincide with the location of the dummy sources. Positions of maximum detector response were obtained and compared to the positions of the dummy sources. Live imaging techniques of the source positions were used when the applicator design did not allow accurate use of the 2D-array.
Results: The assigned dwell positions deviated from the corresponding coordinates of the detector response with a significant deviation in ring applicators. Using the 2D-Array, the intra-uterine applicator showed better agreement than the ring applicator, though errors of more than 3 mm was common. Due to the design of the ring applicator, live imaging of the source proved a better technique. Alarmingly, maximum deviations of dwell positions were as high as 7mm.
Conclusion: The 2D-array is a useful tool for quick autoradiography tests, but it has limitations. The dimensions of the detectors and increased source distance of some applicators may affect the results. Live imaging was more accurate, but requires applicators that cannot be used clinically.

Keywords: Brachytherapy, Autoradiography, 2D-Array

CR -2

Title: **STEREOTACTIC RADIOSURGERY WITH MODERN LINEAR ACCELERATORS: NOT JUST AN ALTERNATIVE ANYMORE**

Authors: W Shaw
Department: Medical Physics
Presenter: Willie Shaw

Introduction and aim: Treatment with a GammaKnife Stereotactic Radiosurgery (SRS) system has long been deemed as the standard of care for Cranial Stereotactic irradiation. Linear Accelerators (linacs) have long been available and used for this purpose as well, however today the GammaKnife system is still regarded as superior to linacs. Modern linacs nowadays perform at the same required level for this kind of treatment. This Monte Carlo based planning study compares 4 different linear accelerators in terms of their ability to perform highly conformal stereotactic radiotherapy for small, medium and large sized brain lesions.
Methodology: Stereotactic Radiosurgery and radiotherapy treatment plans produced with ultra-modern volumetric modulated arc therapy techniques for small, medium and large brain lesions on the Hyperion treatment planning system. Treatment plans were performed using beam models of 4 different linear accelerators, each with a unique collimating device. Final optimized dose distributions were compared between the linear accelerators used in this study, as well as what could be expected when a GammaKnife system would have been used.
Results: Each of the linear accelerators studied produced dose distributions that would be acceptable for this treatment. The different collimator devices only showed small differences in the small lesion treatment plans. Higher resolution collimators performed only slightly better than those with courser collimation. The dose distributions were in many aspects also more favourable compared to general GammaKnife published results. Results indicate that any of these accelerators tested could be employed with similar or better dose distributions compared to any other dedicated stereotactic treatment systems. X-ray fleunce smoothing during optimization had a much a bigger impact on the final treatment plan quality than the collimator characteristics.
Conclusion: Linear accelerators with modern collimating devices are not only an alternative to GammaKnife systems, they are more versatile and compare favourably on some situations with dedicated stereotactic systems. Treatment planner experience and optimization parameters have a bigger impact on the treatment plan quality than collimation characteristics.

Keywords: Stereotactic Radiosurgery, Linear Accelerator, Collimator

CR -3

Title: **CONGENITAL HEART DEFECTS IN CHILDREN WITH CLEFT LIPS AND/OR PALATES AT AN ACADEMIC HOSPITAL IN CENTRAL SOUTH AFRICA**

Authors: EW Turton[+], WJ Barrett[+], BJS Diedericks[+], CL Barrett[*], G Joubert[#]
Departments: Anaesthesiology[+], Internal medicine[*], Biostatistics[#]
Presenter: Edwin Turton

Background: Globally, cleft deformities are the most common craniofacial anomalies and show an association with congenital heart defects. Little research on cleft lips and/or palates (CL/P) and congenital heart defects has been reported from Africa, and none from South Africa. In 2001, it was proposed that CL/P be listed as one of six priority conditions for monitoring and notification to health authorities. This goal of creating a national registry has not been achieved. A near-fatal anaesthetic incident following a missed cardiac lesion in a child with a cleft lip and palate prompted this study.
Objectives: To describe the prevalence of congenital heart defects diagnosed in children with CL/P presenting for corrective surgery during the Smile Week over three consecutive years (2013–2015) at an academic hospital in South Africa.
Methods: A retrospective, descriptive file review of 62 patients with CL/P was performed. Since 2013, echocardiography has been performed on all patients with CL/P.
Results: Twenty-three, 21 and 18 patients (n=62) were operated in 2013, 2014 and 2015, respectively. 85.5% (n=53) had no clinical signs to support a cardiac defect. Eight of those patients without reported signs of cardiac lesions had clinically significant cardiac defects on echocardiography. Sixteen patients (25.8%) with a cleft deformity had a clinically significant congenital heart lesion. Of the 16 patients with a cardiac defect on transthoracic echocardiography, only four had clinical signs to suggest a cardiac defect. Therefore, sensitivity of clinical examination was 25%, whereas the specificity was 89.1%. Three of the four patients with a documented syndrome had a clinically significant echocardiographic finding.
Conclusion. A national guideline for the pre-operative care of patients with CL/P, including routine echocardiography, is needed. Furthermore, a national registry is required for patients with CL/P with associated congenital anomalies.

Keywords: Cleft facial deformities, Pre- operative care, Echocardiography, Congenital heart defect

CR -4

Title: **THE PROFILE OF MICROORGANISMS AND ANTIMICROBIAL SUSCEPTIBILITY ASSOCIATED WITH NEUTROPENIC FEVER IN PATIENTS WITH HEMATOLOGICAL DISORDERS AT UNIVERSITAS HOSPITAL.**

Authors: E Glover, S Potgieter, CL Barrett, G Joubert
Departments: Internal Medicine, Biostatistics
Presenter: Elitia Glover

Introduction: Neutropenic fever is a life-threatening complication of bone marrow dysfunction and cytotoxic chemotherapy. There is a paucity of information from South Africa regarding the microorganisms associated with neutropenic fever episodes in the setting of hematological conditions (acute myeloid leukemia, acute lymphoblastic leukemia, aplastic anemia, hodgkin lymphoma, etc).
Methodology: A retrospective survey of 92 neutropenic fever episodes that occurred between 1 July 2013 and 30 June 2015 at Universitas Hospital, South Africa, being treated for hematologic conditions was performed. Antibiotic susceptibility data were analyzed and compared to the local empiric antimicrobial protocol for the management of neutropenic fever.
Results: During the two-year study period, inclusion criteria were fulfilled by 55 patients presenting with a total of 92 neutropenic episodes. Ninety-two significant microorganisms were isolated in 62 of the 92 neutropenic episodes. In 30 (33%) neutropenic episodes no microorganisms were cultured, and in 21 episodes more than one organism was cultured. At least one infectious agent was identified in 67% (62/92) of neutropenic fever episodes, 59% (54/92) of isolates were cultured from blood. Gram positive (42%), gram negative (42%), fungi (11%) and viral (4%) organisms were identified. The most commonly isolated gram negative microorganism was Escherichia coli (15 isolates) with none producing extended spectrum betalactamse (ESBL), followed by Klebsiella pneumonia (12 isolates) and 8/12 (66%) were ESBL producing. Histological samples identified fungal etiology in four episodes.
Conclusion: The institutional protocol, which initiates patients with neutropenic fever empirically on combination piperacillin-tazobactam and amikacin, is still appropriate to cover the bacterial organisms seen at Universitas Academic hospital, as is the use of amphotericin B for managing invasive fungal infections. We recommend that the choice of empiric antibiotics should be reviewed regularly, especially in light of the emergence of ESBL producing Klebsiella, which was the second most common gram negative isolate, with only a third of the isolates being susceptible to piperacillin-tazobactam.

Keywords: Neutropenic sepsis, Hematology, Empiric protocol

CR -5

Title: **CHRONIC MYELOID LEUKEMIA AT UNIVERSITAS ACADEMIC HOSPITAL. ARE WE REACHING THE TARGETS ACCORDING TO THE EUROPEAN LEUKEMIANET GUIDELINES?**

Authors: JLeR Malherbe, TB Sikhipa, CD Viljoen, G Joubert, CL Barrett, S Dhar
Departments: Internal Medicine, GMO Unit, Haematology and Cell Biology, Biostatistics
Presenter: Jacques Malherbe

Introduction: Chronic myeloid leukemia (CML) is a myeloproliferative neoplasm caused by a balanced translocation between chromosome 9 and 22, t(9;22), also known as the Philadelphia (Ph) chromosome. The translocation forms the BCR-ABL oncogene which encodes for a constitutively active tyrosine kinase, which drives the clonal proliferation of the malignancy. The development of the tyrosine kinase inhibitor (TKI), imatinib, has revolutionized CML treatment, and has become the standard of care. Nilotinib and dasatinib, second-line TKI's, have further increased the armamentarium against CML. Response to therapy is monitored by quantification of Ph chromosome or BCR-ABL oncogene by fluorescent in situ hybridization (FISH) or quantitative reverse transcriptase polymerase chain reaction (RQ-PCR) respectively. Based on this quantification, the European LeukemiaNet (ELN) defines response as optimal, warning, or failure at 3, 6, 12, and 18 months from initiation of treatment. There is a paucity of local data on early response to imatinib treatment.
Methods: A retrospective file review of all adult CML cases in chronic or accelerated phase diagnosed between 2010 and 2014 and initiated on imatinib as first line therapy at our institution was performed. Baseline clinical features and response to imatinib were evaluated. Response to therapy was measured against ELN response criteria at 3, 6, 12 and 18 months.
Results: Thirty-seven patient files met inclusion criteria and were reviewed. Data from 28 files were evaluable. Optimal responses at 3, 6, 12, and 18 months were 83%, 54%, 50%, and 67% respectively, while warnings at these time points were 17%, 29%, 33%, and 21%, and failures 0%, 17%, 17%, and 13% respectively.
Conclusions: While the majority of patients attain an optimal response by 18 months, there is a significant proportion of patients failing 1st line imatinib after 18 months of therapy. Further studies are neccessary to identify the factors that contribute to treatment failure in our institution.

Keywords:

CR -6

Title: **PREVENTABLE WARFARIN-INDUCED BIRTH DEFECTS: A MISSED OPPORTUNITY?**

Authors: M Conradie, C van Wyk, BD Henderson
Departments: Neurology, Health Sciences Education.
Presenter: Maureen Conradie

Background: Congenital abnormalities and pregnancy losses due to the teratogenic effects of warfarin are still prevalent among the South African population. This is potentially preventable if the challenges and barriers faced by at-risk women are understood and addressed effectively.
Objectives: To determine the practice, knowledge and attitudes regarding the teratogenic risks experienced by women on warfarin.
Methods. A descriptive study was performed. Quantitative data were collected through a researcher-administered questionnaire. The target population comprised of 101 women of reproductive age who took warfarin treatment and attended a single tertiary level anticoagulation clinic.
Results: Language barriers, poor understanding of basic terminology and mathematics, poor contraceptive and family planning practices, lack of knowledge regarding the risks of warfarin in pregnancy and passive attitudes towards information attainment are patient related challenges identified in this study.
Conclusion: Interventions are necessary to address the challenges in such settings. This includes increased awareness of the teratogenic potential of specific chronic medications among healthcare providers, patients and the public. Standardised management protocols of women of reproductive age initiated on teratogenic medications should be implemented that includes contraceptive and family planning discussions at follow up visits. Improvement of the counselling skills of healthcare providers and the availability of translators or healthcare providers fluent in local languages could assist in risk reduction.

Keywords: teratogenesis, birth defect, pregnancy

CR -7

Title: **COMPUTERIZED ASSESSMENT OF EYE TRACKING TO ENHANCE CLINICAL OBSERVATIONS IN OCCUPATIONAL THERAPY**

Authors: E Janse van Rensburg, P Blignaut, M Oberholzer
Departments: Occupational Therapy, Computer Science and Informatics, Optometry
Presenter: Elize Janse van Rensburg

Introduction: Eye movements play a vital role in the development of functions such as visual form and space perception, reading, motor planning and eye-hand coordination. Fluidity and accuracy of eye movements give an indication of how well eye movements are coordinated, the sensory integration of vestibular and visual information and dissociation of the movements of the head and eyes. Occupational therapists mainly make use of informal clinical observations to assess clients' eye movements. However, observations can be subjective and are hard to quantify in a reliable and valid manner. Therefore, the need for a more precise assessment tool to assess eye movements exists.
Objectives: To develop a computerized eye tracking assessment system to enhance clinical observations in occupational therapy. Method: A quantitative, descriptive approach was followed in this exploratory study. This paper reports on the rationale and procedures followed in the initial multi-disciplinary development of computer software for the assessment of eye movements using an electronic eye tracker.
Results: Data from pilot studies performed with different age groups demonstrate the strengths and challenges of the system. This system has the potential to be used to monitor progress, measure outcomes and perform further research in this field.
Conclusion: Computerized eye tracking assessment can enhance the accuracy and precision with which eye movements can be assessed by occupational therapists. It is envisioned that this system will provide a platform for the development of computerized interventions to address specific occupational dysfunctions related to poor eye movements such as reading difficulties.

Keywords: oculomotor control, gaze interaction, eye tracker

CR -8

Title: **PREOPERATIVE NEURODEVELOPMENTAL ASSESSMENTS IN YOUNG CHILDREN UNDERGOING CARDIAC SURGERY IN CENTRAL SOUTH AFRICA: FEASIBILITY AND CLINICAL VALUE**

Authors: R Smith, J Potterton, V Ntsiea, S Brown
Departments: Physiotherapy, Wits; Paediatrics and Child Health, UFS
Presenter: Robyn smith

Introduction and aim: Congenital heart disease survivors are at heightened risk of neurodevelopmental delays. Pre-operative neurodevelopmental assessment may assist in the early identification of children at-risk or presenting with developmental delays. This study aimed to determine the pre-operative neurodevelopmental status of young children undergoing cardiac surgery in central South Africa. In addition, the feasibility and clinical value of pre-operative neurodevelopmental assessment was evaluated.
Methodology: Children 30 months and younger, scheduled to undergo cardiac surgery were recruited into this prospective descriptive study. Neurodevelopmental status was assessed using the Bayley Scales of Infant and Toddler Development, Third Edition and neuromotor examination. Variables associated with developmental performance were determined using analysis of variance. Sociodemographic data was collected from medical records and parental interviews. Severity of the cardiac disease was rated according to the Cardiologists Perception of Medical Severity Scale.
Results: Forty-one out of 60 eligible children were included in the study with pre-operative neurodevelopmental assessments completed for 40 children at a median age of 7.4 months. The inclusion rate was 68% and was limited mainly by environmental barriers. There was a high prevalence of developmental delays (35%) and neurologic abnormalities (45%) prior to cardiac surgery. Children with Down syndrome tended to have poorer developmental performance. More than half (52.5%) of the children qualified for early intervention therapies.
Conclusion: Pre-operative neurodevelopmental assessment proved clinically valuable in identifying children at-risk or presenting with developmental delays, facilitating early referral to intervention therapies. Pre-operative neurodevelopmental assessment may be of high importance in South Africa due to extended waiting periods for cardiac surgery and limited neuroimaging resources.

Keywords: Congenital heart disease, Pre-operative, Neurodevelopmental assessment

CR -9

Title: **OUTCOMES OF CHILDREN WITH DOWN SYNDROME AND CONGENITAL HEART DISEASE UNDERGOING CARDIAC SURGERY IN CENTRAL SOUTH AFRICA**

Authors: R Smith, J Potterton, V Ntsiea, S Brown
Departments: Physiotherapy, Wits; Paediatrics and Child Health, UFS
Presenter: Robyn Smith

Introduction and aim: Children with Down syndrome (DS) and congenital heart disease (CHD) are at heightened risk of developmental delay. This study aimed to determine the neurodevelopmental outcome of children with DS undergoing cardiac surgery in central South Africa. In addition, growth, health-related quality of life (HRQOL) and parenting stress were evaluated.
Methodology: Children 30 months and younger, scheduled to undergo cardiac surgery were recruited into this prospective descriptive study. Neurodevelopmental status was assessed using the Bayley-III and neuromotor examination. Growth was assessed using DS-specific growth charts. Parenting stress and perceived HRQOL were assessed using the Parenting Stress Index- Short Form and the Paediatric Quality of life Inventory respectively. Measures were repeated at three-month and six-month post-surgery. Sociodemographic data was collected from medical records and parental interviews.
Results: Baseline data was collected for 40 parent and child pairs. A quarter of the children (n=10; 25%) were diagnosed with DS. All children with DS (n=10; 100%) had marked hypotonia. Children with DS had delayed development across all developmental domains at all time points of assessment. Developmental performance was significantly poorer ($p<0.01$) compared with children with CHD. Growth was comparable for children with and without DS across the study. Parents of children with DS viewed their children as having reasonably good HRQOL, albeit it significantly poorer (P=0.04) than that of children without DS post-surgery. Half or more parents of children with and without DS experienced clinically significant stress prior to their child's cardiac surgery, stress however remained high in parents of children with DS after their child's cardiac surgery.
Conclusion: Children with DS had significant developmental delays requiring early developmental assessment and referral for intervention therapies. Parents of children with DS experienced consistent high levels of stress and should be regularly screened for psychological problems requiring intervention.

Keywords: Congenital heart disease, Down syndrome, Outcomes

CR -10

Title: **THE PROFILE AND OUTCOME OF SMALL BOWEL ATRESIA AT UNIVERSITAS ACADEMIC HOSPITAL**

Authors: H du Preez, E Brits
Departments: Surgery
Presenter: Hilge du Preez

Background: Universitas Academic Hospital is located in and drains the entire central South Africa. Associated congenital anomalies and prematurity are the main predictors of mortality in first world countries. In third world countries, late referrals and lack of resources, contribute to mortality. This study aims to objectively describe the outcome of small bowel atresia at our institution.
Methods: A retrospective descriptive study was done. Patient sample included all neonates admitted with small bowel atresia from 1 January 2010- 31 October 2016. We analysed patient information and recorded data including birth demographics, status on arrival, in hospital stay and outcomes.
Results: Our study sample was 92 patients. Median gestation was 34 weeks. Average birthweight was 2,15kg. The majority were born in the Free State (69.6%). Only 7 patients were diagnosed antenatally and only 13 (14,1%) were born in a tertiary institution. The commonest associated congenital anomaly, was a cardiac lesion. (43,5%) Late referrals were common, with 67(72,8%) arriving after 48hours of birth, 56 (60,8%) arrived dehydrated and 51 (55,4%) arrived septic. The median age at surgery was 7,5 days. The median age full feeds were reached was 18 days and 26 (28,6%) had a feeding intolerance. The median number of septic episodes were 2 per patient. Median lentghof stay was 28 days. We had a low mortality rate, 8 (8,7%) were palliated and 10 (10,9%) demised. Mortality was strongly associated with prematurity.
Conclusion: Despite the majority of patients being referred late, our mortality was comparable to first world countries. We were able to overcome this burden due to access to resources, sophisticated equipment and a low surgical complication rate. Length of stay could be decreased with a feeding protocol and discharge goals.

Keywords: Atresia, Bowel, Outcome

CR -11

Title: **Laryngeal Tuberculosis at Universitas Academic Hospital, Bloemfontein**

Authors: A Matimba, RY Seedat, M Moncho, J Musoke, G Joubert
Departments: Otorhinolaryngology, Medical Microbiology and Biostatistics
Presenter: Abongile Matimba

Introduction and Aim: Tuberculosis(TB) is the most frequent granulomatous disease involving the larynx. The aim was to determine the prevalence of TB in laryngeal biopsies and determine the clinical presentation and laboratory diagnosis of laryngeal TB.
Methods: This was a prospective study over a year from May 2017-April 2018. All adult patients undergoing direct laryngoscopy and biopsy and had specimens sent for histopathological examination, TB PCR (GeneXpert) and TB microscopy,culture and sensitivity.
Results: Of the 80 patients, Five(6,25%,95% CI 2.1% to 14.0%), were diagnosed with laryngeal tuberculosis, median age at presentation was 56,0(ranging from 18.1- 83.5) with majority being males. The most common symptoms in our study were dysphonia 5(100%). Of our five TB larynx patients the most frequent endoscopic presentation was a lesion of granulomatous appearance 2(40%), followed by nonspecific inflammatory, ulcerofungative and tumour 1(20%) respectively. TB larynx patients Three(60%) had active lesions (cavities in the upper lobes and hilar lymph nodes) and 2(40%) had inactive lesions (upper lobe fibrosis) on CXR. of the 5(6,25%) positive laryngeal TB patients, Two(40%) were diagnosed based on histology (necrotising epithelioid granulomas with giant Langerhans cell), 1(20%) on both TB genexpert (PCR) and Histology (caseating epithelioid granulomas with giant cells), none had positive ZN stain and 2(40%) on tissue culture (mycobacteria tuberculosis).
Conclusion: We found a prevalence of 6.25% of TB in laryngeal biopsies. Diagnosis requires a combination of PCR, culture and histopathology. The successful management of patients with laryngeal tuberculosis relies on clinical suspicion, prompt diagnosis and early initiation of anti-tuberculosis chemotherapy regimen.

Keywords: Larynx TB, Extra Pulmonary TB, Tuberculosis

CR -12

Title: **QUALITY OF LIFE ASSESSMENT IN PATIENTS WITH ALLERGIC RHINITIS**

Authors: D Ramdhani, RY Seedat, T Daniller, G Joubert
Departments: Otorhinolaryngology
Presenter: Devesh Ramdhani

Introduction: Allergic rhinitis represents a global health problem that can adversely affect quality of life, impacting academic performance, social life and affecting work performance
Aims: The aims of this study were to determine the impact of allergic rhinitis on the Quality of Life of adult patients attending the Ear Nose and Throat clinic at the Universitas Academic Hospital Complex and to -
determine the change in the Quality of Life of patients with allergic rhinitis after one month of treatment.
Methods: This was a prospective, descriptive study of patients over the age of 18 years who were diagnosed with allergic rhinitis at the Department of Otorhinolaryngology at Universitas Hospital between 1 May 2017 and 30 April 2018. Clinical data was recorded on a data form and the patients completed the Juniper mini Rhinoconjunctivitis Quality of life Questionnaire. Patients were reassessed after one month of treatment and again completed the Juniper mini Rhinoconjunctivitis Quality of life Questionnaire.
Results: 50 patients were included in the study. Patients were aged 18 to 78 years of age with the mean of 37.86 years. There were 70% female and 30% males. 50% presented with moderate- severe intermittent disease, 44% with mild persistent disease, 4% with mild intermittent disease and 2% with moderate- sever persistent disease. There was a significant improvement in quality of life following one month of treatment. The greatest improvements were in daily activities, nasal symptoms and eye symptoms.
Conclusion: Allergic rhinitis adversely affected quality of life, with a significant improvement in quality of life following one month of treatment.

Keywords: Allergic Rhinitis, Quality of life

CR -13

Title: **COST ANALYSIS OF VIOLENCE-RELATED MEDICAL IMAGING IN A FREE STATE TERTIARY TRAUMA UNIT**

Authors: TP Steyn, F Gebremariam
Departments: Clinical Imaging Sciences
Presenter: Tiaan Steyn

Introduction: Medical care and -imaging are expensive and health care practitioners, specifically in the public sector, are largely unaware of the costs involved. There is no data available regarding the cost of medical imaging in the public health care sector. This study aimed to provide this data in a select patient population in a tertiary public hospital. Patients with violence-related injuries were chosen as the study sample due to the large socio-economic impact violence has on society.
Aim: To provide a reliable cost-to-patient analysis of medical imaging in violence-related injuries in a tertiary public hospital and additionally, to provide epidemiological data on violence-related injuries treated at Pelonomi Tertiary Hospital's trauma unit.
Methodology: The hospital's trauma unit registry was used and 1 380 patients with violence-related injuries were consecutively sampled for the six months ending 31 December 2017. Each patient's imaging investigations were documented and categorised according to the Department of Health's Uniform Patient Fee Schedule (UPFS). Descriptive analysis and cost calculations were performed using the 2017 UPFS tariffs.
Results: Of 1 273 violence-related trauma visits, 5 475 imaging investigations were performed at a cost-to-patient of R7 108 845.00. General X-rays (n = 3834) amounted to R843 354.00, CT scans (n = 1566) to R5 957 280.00 and MRI scans (n = 38) to R271 510.00. In perspective, for every R1.00 billed to a patient, 84c went to CT scans, 12c to X-rays and 4c to MRI.
Conclusion: The cost-to-patient of medical imaging in violence-related injuries were substantial and the largest portion was attributable to CT scans and general X-rays. Measures that will reduce the cost of imaging includes raising cost awareness among referring physicians and radiologists, ensuring appropriate imaging indications for X-rays and CT scans and to reduce the incidence of violence-related injuries.

Keywords:

CR -14

Title: **THE EFFECT OF ORAL SODIUM BICARBONATE ON THE FREQUENCY OF ACUTE GOUT ATTACKS AND SERUM URIC ACID LEVELS IN PATIENTS WITH CHRONIC UNCONTROLLED GOUT. A DOUBLE BLIND RANDOMIZED PLACEBO-CONTROLLED TRIAL.**

Authors: A Griesel, WF Mollentze, BJ Jansen van Rensburg, FC van Rooyen, M Havinga
Departments: Internal Medicine, Rheumatology
Presenter: André Griesel

Background: Gout is a common inflammatory arthritic disease that occurs because of the deposition of monosodium urate crystals in joints, tendons and other peri-articular tissue. Many patients with chronic gout report an improvement in their symptoms by using oral baking soda. No data was previously available to support or contradict this.
Objective: To establish if oral sodium bicarbonate, in patients with chronic uncontrolled gout, reduces the frequency and severity of acute gout attacks , reduces joint pain and to determine its effects on serum uric acid levels.
Methods: Twelve male patients with a physician diagnosis of chronic uncontrolled gout, on standard therapy, between the ages of 18 and 75 years have been randomly selected and divided into an intervention group (to receive oral sodium bicarbonate plus allopurinol) and a placebo group (to receive placebo plus allopurinol). Participants were followed up over 3 months with monthly questionnaires and serum uric acid measurements.
Results: 1 participant (in the intervention group) withdrew consent and 1 participant (in the placebo group) got lost to follow up. The comparison between the intervention and placebo groups were as follows: 2nd visit: mean number of acute gout attacks compared to baseline 0.6 vs. 0.6 in the placebo group (p=1.0), severity of pain 3.8 vs. 3.6 in the placebo group (p=0.0891), mean serum uric acid 0.5 vs. 0.36 in the placebo group (p=0.4489). 3rd visit: mean number of acute gout attacks (compared to previous visit) 1.0 vs. 0.6 in the placebo group (p=0.2286), severity of pain 2.0 vs. 3.4 in the placebo group (p=0.7629), mean serum uric acid 0.47 vs. 0.32 in the placebo group (p=0.7629). 4th visit: mean number of acute gout attacks (compared to previous visit) 1.0 vs. 0.75 in the placebo group (p=0.5378), severity of pain 1.6 vs. 2.5 in the placebo group (p=0.6083), mean serum uric acid 0.51 vs. 0.34 in the placebo group (p=0.5423).
Conclusion: No statistical significant difference was observed between the intervention and placebo groups in any of the variables at any of the time points. There was however a clinical significant reduction in the frequency of acute gout attacks and severity of joint pain in 3 participants in the intervention group.

Keywords:

CR -15

Title: **KNOWLEDGE, ATTITUDE AND PRACTICES OF PATIENTS RECEIVING MAINTENANCE HEMODIALYSIS IN BLOEMFONTEIN, SOUTH AFRICA**

Authors: HC Spies, VL vd Berg, M Nel
Departments: Nutrition and Dietetics, Biostatistics
Presenter: Ermi Spies

Introduction: This is the first Sub-Saharan study to focus on knowledge, attitudes and practices (KAP) regarding the renal diet required for patients on maintenance hemodialysis (MHD).
Methods: In a descriptive, cross-sectional study, KAP-questionnaires were administered during structured interviews in 2017 to 75 participants in five MHD-units in Bloemfontein.
Results: Participants were mostly (70.7%) male (median 50.5 years). Overall, 49.4% scored under 50% on knowledge regarding restricted foods, mineral content of food, and phosphate binder medication; 60% felt negative about the diet; and 61.4% reported poor adherence practices. Whilst, the median education level was Grade 12, participants with tertiary education (28%), had statistically significantly better knowledge scores than those with only primary school education (6.7%) (95% CI: 3.9% ; 73.5%), and those who had only partially completed secondary school (17.3%) (95% CI: 6.3% ; 64.0%). Only 21% had received written and 30.7% verbal nutrition education (NE) in their home language (which was mostly Sesotho [46.7%] and Afrikaans [4%]). Overall, 24% had not received NE in their home and/or second language (which was mostly English [61.4%] and Sesotho [18.7%]). Having received NE in a home language and/or second language was associated with statistically significantly higher knowledge scores (95% CI: 3.7% ; 49.5%). Most (77.3%) reported ≤1 consultation with a dietitian per MHD year (NKF-K/DOQI recommendation: more than 3).
Conclusion: This population presented with poor KAP regarding the renal diet, and inadequate involvement of dietitians in their treatment. Higher education level and provision of NE in a first or second language was associated with better KAP.

Keywords: Maintenance hemodialysis, KAP, Nutrition Education

CR -16

Title: **ASSESSMENT OF METERED DOSE INHALER TECHNIQUE, PERFORMED AT THE PULMONOLOGY CLINIC AT A TERTIARY HOSPITAL IN THE FREE STATE, SOUTH AFRICA**

Authors: Y Ramkillawan, RY Seedat, M Prins
Departments: Pulmonology, Otorhinolaryngology
Presenter: Yeishna Ramkillawan

Introduction: Chronic lower respiratory disease is the eighth leading cause of mortality in South Africa. Inadequate metered dose inhaler (MDI) technique remains a challenge in the adequate management of chronic respiratory diseases.
Aim: We assessed MDI technique amongst respiratory outpatients, identified the main indications for MDI use and factors associated with improper use.
Methodology: This was a prospective, quantitative, descriptive study conducted at the adult, respiratory clinic of Universitas Academic Hospital. A convenience sample of 100 participants was used. An interview was done to obtain socio-demographic characteristics, clinical data and participant perceptions about their inhaler, in English or Afrikaans. Participants demonstrated the use of either a placebo MDI alone or a large volume spacer and placebo MDI. The inhaler technique was evaluated, according to the United Kingdom inhaler group standard for inhaler therapy. Incorrect technique was defined as a score below seven for either the MDI or the spacer and MDI groups.
Results: Chronic Obstructive Pulmonary Disease (35%) and Asthma (32%) were the commonest indications for MDI use. Ninety seven participants (97%) preferred to use a MDI alone. Thirteen participants (13%) correctly performed all seven steps of using a MDI alone. In the MDI with a spacer group, two of three participants (66%) had a perfect score of seven. In the MDI alone group, the median number of correctly performed steps was five with step one being the most frequently performed correct step (98%) and step 3 the most frequent wrong step (70%). An education level of lower than matric was the only predictor associated with poor inhaler technique. (p=0.0153)
Conclusion: Poor inhaler technique is common amongst respiratory outpatients. Education of both health care workers and patients is an integral step in improving inhaler technique and thereby improving disease outcomes and quality of life.

Keywords: inhaler, lung disease

CR -17

Title: **CONTROVERSY REGARDING DA VINCI'S GUT FEELING.**

Authors: C Vorster, A Nel
Department: Basic Medical Sciences
Presenter: Carina Vorster

Introduction and aim: According to Gray's Anatomy, the prescribed text book for medical students, the "mesentery" is described as a large fan-shaped double layered fold of peritoneum that connects the jejunum and ileum to the posterior abdominal wall. No reference is made to mesocolons on the right and left side. The transverse - and sigmoid mesocolon each, are described as separate structures. An article published by J.C. Coffey and D.P. O'Leary in May 2017, where they describe the mesentery and the different mesocolons as a single continuous structure, contradicts this. Our aim was to compare and note the anatomy of the right mesocolons and any mesenteric lymphadenopathy in formalin-fixed cadavers, in order to compare with the findings of Coffey and O'Leary.
Methodology: Cadavers in the Anatomy dissection hall were inspected to note whether a right mesocolon and any mesenteric lymphadenopathy was present.
Results: Twenty-seven cadavers were inspected. Right-sided mesocolons were observed in 23 cadavers and right-sided lymphadenopathy were observed in the mesenteries of four cadavers.
Conclusion: Our findings in the 23 cadavers correlates with the findings of Coffey and O'Leary.
Continuity between the small intestinal and right mesocolic mesenteries will contribute to the explanation of the significant amount of lymphatic tissue found at the ileocecal level. This may correlate with the development of right-sided pain in mesenteric adenitis, worse outcomes with right-sided colon cancer as well as the improved outcome in Crohn's disease, if the mesentery is removed with the bowel during surgery for this disease.

Keywords: Right-sided Mesocolons, Mesentery, Inflammatory Bowl Disease

CR -18

Title: **HYPOPHOSPHATEMIA AFTER CARDIOPULMONARY BYPASS – INCIDENCE AND CLINICAL SIGNIFICANCE, A SOUTH AFRICAN PERSPECTIVE**

Authors: LE Grobbelaar, LE Grobbelaar, G Joubert, BJS Diedericks
Departments: Anaesthesiology, Biostatitstics
Presenter: Laurence Grobbelaar

Introduction: Hypophosphatemia, after cardiopulmonary bypass, has clinical implications that include: increases in length of intensive care unit (ICU) stay, length of ventilation and need in cardio-active drug requirements. The incidence of hypophosphatemia (primary aim) and the impact on the above mentioned post-operative care variables (secondary aims) were evaluated in a South African population.
Method: Adult patients requiring elective or urgent open cardiac surgery, on cardiopulmonary bypass, that had a predicted peri-operative mortality of ≤ 5%, were included. Pre-operative phosphate levels were determined and repeated immediately on ICU arrival and daily thereafter until discharge. Hypophosphatemia was defined as a phosphate level below 0.8 mmol/l. Based on the combined variation value, a change in phosphate level of ≥ 23.95% could not be attributed to biological or analytical variation alone. Duration of ventilation and ICU stay, as well as the need for cardiovascular support, were documented.
Results: Data collection took place from April 2017 to March 2018 with 101 patients included. The incidence of hypophosphatemia, immediately post-operatively, was 12.6% (95% CI, 6.7% - 21.0%) while 26.3% (95% CI, 17.8% - 36.4%) had a significant decrease in phosphate. Hypophosphatemia peaked on Day 3 at 29.0% (95% CI, 20.1% - 39.4%) with new onset hypophosphatemia at any stage during the ICU stay was 52.6% (95% CI, 42.1% - 63.0%). Regarding the secondary aims: no associations were identified.
Conclusion: Hypophosphatemia was common after cardiopulmonary bypass in this population. Incidence was higher than expected but did not translate into a clinical implication as the degree was usually mild (0.66 - 0.79 mmol/l). With a less conservative extubation protocol, the impact of hypophosphatemia may be more significant.

Keywords: Hypophosphatemia, Cardiopulmonary Bypass, Cardioplegic Solutions

CR -19

Title: **PREVALENCE OF ISONIAZID RESISTANCE-CONFERRING MUTATIONS ASSOCIATED WITH MULTI-DRUG RESISTANT TUBERCULOSIS IN THE FREE STATE PROVINCE, SOUTH AFRICA**

Authors: L Pitso, S Potgieter, A Van Der Spoel Van Dijk
Departments: Internal Medicine; Medical Microbiology
Presenter: Lebohang Pitso

Background: Multi-drug resistant tuberculosis (MDR-TB), along with extensively-drug resistant tuberculosis (XDR-TB), threatens local and global control. The molecular line probe assay (LPA) was endorsed in 2008 by the World Health Organization (WHO) and has provided rapid diagnosis and early management of MDR-TB. The LPA detects mutations of katG and inhA genes in TB isolates that are associated with isoniazid (INH) resistance. katG is associated with high-level INH resistance while inhA is associated with low-level INH resistance plus cross-resistance to ethionamide. Patients with MDR-TB due to an inhA mutation could benefit from the use of high-dose INH in their MDR-TB regimen instead of ethionamide.
Objectives: We sought to determine the frequencies of katG and inhA mutations that confer INH resistance among MDR-TB isolates during 2014 – 2016 in the Free State (FS) province of South Africa.
Methods: We retrospectively reviewed MDR-TB isolates assayed with GenoType MTBDRplus at the TB laboratory of the Universitas Academic hospital and calculated the frequencies of katG and inhA mutations.
Results: Amongst the 918 MDR-TB isolates, the prevalence of katG, inhA as well as katG plus inhA mutations were 63.9%, 13.4% and 22.7% respectively. Xhariep district had the highest incidence rate of INH resistance-conferring mutations in the province
Conclusion: katG associated mutations are the predominant INH resistance-conferring mechanism among MDR-TB isolates in the FS; however, at least 13.4% of the isolates have inhA gene mutations and could benefit from the addition of high-dose INH to their MDR-TB treatment regimen. We recommend clinicians to modify the standardised MDR-TB regimen to include high-dose INH instead of ethionamide whenever an inhA mutation alone is present. An additional 22% of isolates demonstrated dual katG and inhA gene mutations making these patients unlikely to respond to either high dose INH or ethionamide. This group requires consideration for an individualised TB treatment regimen.

Keywords: multi-drug resistant tuberculosis (MDR-TB), isoniazid (INH) resistance mutations, line probe assay (LPA)

CR -20

Title: **INTEROBSERVER VARIABILITY INFLUENCES THE LUGANO CLASSIFICATION WHEN RESTAGING LYMPHOMA**

Authors: JS Möller, T Steyn, N Combrinck, G Joubert, A Sherriff, J Janse van Rensburg
Departments: Clinical Imaging Sciences, Biostatistics, Oncology
Presenter: Jakes Möller

Introduction and Aim: Lymphoma is an important and potentially curable oncological disease in South Africa. The staging and restaging of lymphoma has evolved over the years, with the latest international consensus guideline being the Lugano classification (LC). Prior to routine implementation of the LC, its robustness in the local setting should be determined. Aim: Determining the interobserver variability in response assignment when applying the LC in patients with lymphoma who were staged and restaged with computed tomography. In case of excessive discordance, specific mitigating measures will have to be taken prior and during any proposed implementation of the LC.
Methodology: A total of 61 computed tomography scans in 21 patients were evaluated independently by four reviewers according to the LC, of which 21 scans were done at baseline, 21 at initial restaging and 19 at follow-up restaging. A retrospective comparative analysis was performed. Kappa values were calculated to determine agreement between observers.
Results: Only a moderate interobserver agreement of 52% in the overall response classification was demonstrated. The most important sources of discrepancy were inconsistency in assessment of target lesion regression to normal, determining the percentage change in the summed cross-sectional area of the target lesions and ascribing new lesions as either due to lymphoma or other causes.
Conclusion: Implementing the Lugano classification when restaging lymphoma is desirable to improve consistency and to conform to international guidelines. However, our study shows substantial interobserver variability in response classification, potentially altering the treatment plan. Dedicated training and continuous quality control should therefore accompany the process.

Keywords: Lymphoma, Lugano classification, Staging and restaging

CR -21

Title: **CONTROL OF RHEUMATOID ARTHRITIS AT RHEUMATOLOGY OUTPATIENT DEPARTMENT OF UNIVERSITAS HOSPITAL, BLOEMFONTEIN**

Authors: RMN Carter, BJ Jansen van Rensburg, G Joubert
Departments: Internal Medicine, Rheumatology, Biostatistics
Presenter: Richard Carter

I*ntroduction and aim*: Rheumatoid arthritis is a highly prevalent disease with a significant impact on morbidity and life expectancy. There is a paucity of literature relating to the current state of disease control in South Africa, and none so in the Free State province. The aims of this study were as follows: 1. To evaluate the degree of control of rheumatoid arthritis at the Rheumatology outpatient department of Universitas Central Hospital. 2. To determine the relative impact of various factors contributing to poor disease control.
Methodology: A cross sectional study was undertaken over a period of 8 months from December 2016 to August 2017 at the Rheumatology outpatient department of Universitas Central Hospital in Bloemfontein. Information sheets were used to collect data pertaining to current disease control, possible reasons for poor control, and relevant demographic data.
Results: Data were analyzed on 161 patients. The results revealed that 34 (21.12%) patients were controlled. Of the 127 patients not controlling, 61 (37.89%) reported dispensing issues relating to poor drug availability at pharmacies, and 72 (56.69%) were on insufficient treatment for their disease state. Of these 72, 33 (45.83%) reported concomitant dispensing issues. Other factors such as transport/access problems, administrative issues, adverse events, and poor adherence/insight played minor roles. The majority of patients (95.65%) reported to receive all of their Disease Modifying Anti-Rheumatic Drugs (DMARDs) during the first month. This decreased to 73.91% in second month and only 55.26% in the subsequent months from their down referral units.
Conclusions: The disease control in this institution is suboptimal compared to local and international standards. Problems with dispensing of medication and inadequate escalation of therapy are the predominant contributors to poor control in this study. The bulk of concern with the dispensing lies with the poor availability of DMARDs in peripheral pharmacies.

Keywords: Rheumatoid Arthritis, Control, Bloemfontein

CR -22

Title: **UNCERTAINTIES IN THE CERTAINTY OF ADVANCED RADIOTHERAPY FOR CERVICAL CANCER**

Authors: FHJ O'Reilly, L Strauss, W Shaw
Department: Medical Physics
Presenter: Dedri O'Reilly

Introduction: Intensity modulated Radiotherapy (IMRT) has been proposed for external beam radiotherapy of cervical cancer. However, substantial pelvic organ motion can be unpredictable, demanding generous clinical target volume (CTV) to planning target volume (PTV) margins that subsequently impedes the IMRT benefit. In this study we explore the motion uncertainties associated with significant IMRT benefit reduction.
Methodology: 12 patients with locally advanced cervical cancer were included in this retrospective study. Daily cone beam computed tomography (CBCT) images were registered to the planning CT using bony anatomy. CBCT organ motion metrics were evaluated at 9 different levels in CTV, including the center of mass (COM), contour perimeter and contour volumes to distinguish correlation between OAR and target motion. Population-based margins were derived based on the occupancy of organs throughout the entire treatment.
Results: The median shift in CTV perimeter was 1.5mm and 1.8mm in the lateral and anterior-posterior directions respectively, but there was a wide range with displacement up to 42mm in the anterior-posterior (AP) direction. Weak correlations between bladder and CTV motion (R2 =0.1) in the AP and lateral directions were found. More significant correlations were found between rectum and CTV motion (R2 = 0.8) especially in the AP direction. Based on population-based occupancy of organs, margins of up to 25mm were necessary to ensure adequate coverage of the target volume.
Conclusion: Weak correlations confirm the uncertainty of the origin of tumour motion. This casts doubt on the effectiveness to stabilize these organs in an effort to reduce geometrical uncertainties and thus planning margins. Margins can only be reduced with knowledge of daily variations in organ positions or by using patient models of motion. IMRT in this setting can only be delivered with known probabilities and various degrees of uncertainty.

Keywords: Cervix cancer, Intensity Modulated Radiotherapy (IMRT), Organ motion

CR -23

Title: **A SYSTEMATIC REVIEW OF LITERATURE TO EVALUATE THE BURDEN AND MANAGEMENT OF PHYSICAL AND PSYCHOLOGICAL SYMPTOMS IN PATIENTS DIAGNOSED WITH IDIOPATHIC PULMONARY FIBROSIS.**

Authors: MF van Jaarsveld, L Gwyther
Departments: Palliative Care UCT, Internal Medicine UFS
Presenter: Daleen van Jaarsveld

Introduction and aim: Idiopathic Pulmonary Fibrosis (IPF) is a chronic progressive disease with poor life expectancy and limited treatment options. Palliative care improves quality of life of patients with life-threatening illness in a holistic manner and should be integrated early into management of these patient s. The aim of this systematic review was to evaluate the extent of physical and psychological symptoms and palliative care involvement in the management of patients with IPF.
Methodology: Medline, PubMed and Advanced Google Scholar databases were searched for research articles between January 2000 and December 2016 reported on symptom burden, quality of life and/or any palliative intervention in patients with IPF.
Results: 46 articles were included into this study. Medical Research Council Scale indicated Grade I to Grade III dyspnea with Pulmonary Rehabilitation significantly improving this symptom. Fatigue was evaluated with Fatigue Severity Scale and results indicated significant negative impact on daily life activities. Pitsburgh Sleep Total Questionnaire, Epworth Sleepiness Scale and the Functional outcome in Sleep Questionnaire indicated poor quality of sleep. Beck Depression Inventory and Hospital anxiety and depression scores indicated mild to moderate depression and anxiety. Medical Outcomes Short Form 36 evaluate quality of life with significant impairment in all domains, similarly, St. George Respiratory Questionnaire indicated significant effects of dyspnea on quality of life in all domains. Two studies indicated poor referral to palliative care units and one study reported positive on morphine use for breathlessness in advanced IPF.
Conclusion: This review confirmed poor quality of life in patients with IPF, with poor palliative care referrals in first world countries and no data on care in developing countries. Also, limited research on burden of symptoms and management of these symptoms was found. Increase awareness and research of palliative care needs of patients with IPF was recommended. This is particilarly important for resourch-limited countries including South Africa.

Keywords: Idiopathic Pulmonary Fibrosis, Palliative care, Quality of life

CR -24

Title: **HIV RELATED BURKITT LYMPHOMA IN THE FREE STATE, SOUTH AFRICA: A RETROSPECTIVE COMPARISON OF CLINICAL EXPERIENCE AND OUTCOMES USING SC-EPOCH-RR AND HYPER-CVAD CHEMOTHERAPY FROM 2010 – 2015**

Authors: P Loebenberg, J Malherbe, G Joubert
Departments: Internal Medicine
Presenter: Perry Loebenberg

Introduction and aim: Burkitt Lymphoma (BL) is an aggressive mature B cell neoplasm which arises commonly in HIV positive patients. Little consensus exists as to the optimal treatment of HIV related BL. We conducted this study to document our experiences and outcomes using high intensity hyper-CVAD chemotherapy and lower intensity infusional SC-EPOCH-RR in a resource constrained setting.
Methodology: We performed a retrospective study of HIV positive patients with histologically confirmed BL treated from 2010 – 2015 with curative intent at Universitas Academic Hospital, a publicly funded hospital in Bloemfontein, South Africa. Baseline clinical features, prognostic factors, adverse events and outcomes were analysed in 2 treatment sub-groups: hyper-CVAD and SC-EPOCH-RR.
Results: Twenty-two patients met study inclusion criteria: 15 patients received SC-EPOCH-RR and 7 patients received hyper-CVAD. The median CD4+ T lymphocyte count was 223 cells/mm^3 (range, 9 – 827 cells/mm^3). 17 patients (77%) were not on cART at the time of BL diagnosis. 18 patients (82%) presented with Ann-Arbor Stage IV Lymphoma and 9 patients (41%) had CNS involvement at presentation. At 6 months of follow up: 7 patients (32%) were alive, 3 patients (14%) had died, 9 patients (41%) were lost to follow up, and 3 patients (14%) had voluntarily withdrawn from further treatment. 2-year overall survival (OS) and progression free survival (PFS) in the SC-EPOCH-RR group was 70% (95% CI 39% - 100%) and 63% (95% CI 29% - 97%) respectively. 2-year OS was 0% in the hyper-CVAD group. Significantly higher rates of major adverse events were noted in the hyper-CVAD group.
Conclusion: In this small retrospective case series of patients with advanced HIV related BL, low intensity infusional chemotherapy with SC-EPOCH-RR was more effective than dose intensive hyper-CVAD with superior 2-year PFS and less major adverse events. The small sample sizes , and lack of availability of molecular confirmatory and fluorodeoxyglucose-positron emission tomography limit the extrapolation of these findings.

Keywords: Non-Hodgkin Lymphoma, HIV, Chemotherapy

CR -25

Title: **VENOUS ULCER CARE IN WOUND CARE PRACTICES IN GAUTENG**

Authors: F Bruwer, Y Botma, M Mulder, C Grobler

Departments: Nursing

Presenter: Febe Bruwer

Introduction: Chronic venous disease is the seventh most common chronic disease in the world and is the underlying cause in 40-80% of leg ulcers. Leg ulcers are difficult to treat, very costly to manage, and disabling to the patient.

Objectives: The objective was to describe the current level of care within wound care practices in Gauteng according to the Donabedian Structure-Process-Outcome quality improvement model.

Method: Forty-eight facilities were chosen randomly from wound care practices within Gauteng.Trained fieldworkers conducted structured interviews with care providers to assess infrastructure, human resources, level of education, equipment available and policies and protocols. Within these facilities, 160 patient files were randomly chosen from patients that previously presented with venous lower leg ulcers. A checklist was used to audit these files.

Results: Lack of proper record keeping made data collection challenging. A few important revelations are the fact that facilities lack the necessary equipment to perform vital assessments and that patients are being attended by clinicians with no formal wound care training. In the majority of files (147 n=160) an assessment tool was used, many of the elements thereof were not comprehensively done according to best available evidence. Aspects such as smoking, body mass index and anemia that all play a major role in wound healing were assessed in less than 30% files. Distinguishing between superficial infection and deep infection seems to be a challenge with over utilisation of antimicrobials and antibiotics. Furthermore, 71% received compression therapy while the ABPI of only 30% were known. Amputations were reported in 27 cases. A general decline in recordkeeping was evident from assessment to completion of care.

Conclusion: From this survey it is evident that nurses providing wound care are not all trained in wound care, that best practice guidelines are not being fully implemented, and that the consequences may be detrimental to the patients.

Keywords, Venous leg ulcer, Evidence based practice, Donabedian

CR -26

Title: **HIV TREATMENT IS ASSOCIATED WITH A TWOFOLD HIGHER PROBABILITY OF RAISED TRIGLYCERIDES: POOLED ANALYSES IN 21 023 INDIVIDUALS IN SUB-SAHARAN AFRICA**

Authors: C Walsh (on behalf of the African Partnership for Chronic Disease Research (APCDR))

Department: Nutrition and Dietetics

Presenter: Corinna Walsh

Introduction: Anti-retroviral therapy (ART) regimes for HIV are associated with raised levels of circulating triglycerides (TGs) in western populations. However, there are limited data on the impact of ART on cardiometabolic risk in sub-Saharan African (SSA) populations.

Methods: Pooled analyses of 14 studies comprising 21 023 individuals, on whom relevant cardiometabolic risk factors (including TG), HIV and ART status were assessed between 2003 and 2014, in SSA. The association between ART and raised TG (> 2.3 mmol/L) was analysed using regression models.

Results: Among 10 615 individuals, ART was associated with a two-fold higher probability of raised TG (RR 2.05, 95% CI 1.51–2.77, I2 = 45.2%). The associations between ART and raised blood pressure, glucose, HbA1c, and other lipids were inconsistent across studies.

Conclusion: Evidence from this study confirms the association of ART with raised TG in SSA populations. Given the possible causal effect of raised TG on cardiovascular disease (CVD), the evidence highlights the need for prospective studies to clarify the impact of long term ART on CVD outcomes in SSA.

Keywords: HIV, Triglycerides, Pooled analysis

CR -27

Title: **STUNTING AT BIRTH AND AT 6 WEEKS IN THE NORTHERN CAPE PROVINCE**

Authors: M le Roux, C Walsh and MM Nel
Departments: Department of Nutrition and Dietetics and Biostatistics
Presenter: Corinna Walsh

Introduction: The first 1000 days from conception to 24 months, is a critical period for healthy growth and development. In South Africa, stunting (weight-for-height below -2SD from the WHO reference mean) is a major public health issue with significant health consequences. We determined associations between demographic, health and anthropometric indicators of mothers and their infants.
Methods: A cross sectional study was conducted in all districts in the Northern Cape. All mothers with 5-7 week old babies visiting PHC facilities could participate. A questionnaire was completed in a structured interview with each mother. Weight and length of the baby at birth and at 6 weeks were used to determine stunting, while weight and height of the mother were measured for body mass index (BMI).
Results: Eight hundred questionnaires were completed in 92 facilities. Median age of mothers was 26 years (range 10-46 years) and 44,9% were married. Only 40.1% had completed matric or tertiary education and almost 40% relied on a government grant as main source of income. Two-thirds (64,9%) had not planned the pregnancy. More than a quarter (26,1%) smoked cigarettes or used snuff during pregnancy, while 9,4% drank alcohol. At birth, the majority of babies had a weight-for-age in the normal category (boys-86,8%; girls-88,7%), but more than a quarter had a height-for-age below the WHO reference values (boys-23.7%; girls-29.8%). At 6 weeks, only 67,6% of boys and 79,9% of girls had a length-for-age in the normal range, while 25,4% of mothers were classified as obese and 24,6% as overweight.
Compared to babies that were not stunted, significantly more babies of mothers that were older, overweight, used ART, relied on a grant and smoked/ snuffed during pregnancy were stunted.
Conclusion: To address stunting, interventions aimed at encouraging healthy lifestyles with the emphasis on maintaining a healthy weight, healthy eating and smoking cessation before pregnancy are urgently required.

Keywords: Growth, Stunting, Northern Cape

CR -28

Title: **COMPARISON OF THREE DIFFERENT PLANNING APPROACHES FOR CERVICAL HIGH DOSE RATE BRACHYTHERAPY**

Authors: M Botes, W Shaw, LJ Strauss
Departments: Medical Physics
Presenter: Mari Botes

Introduction and aim: Treatment of cervical cancer with high dose rate (HDR) brachytherapy (BT) can be done using various planning approaches. Depending on the desired dose prescription and outcomes, different dose constraints and aims can be chosen. The aim of this project was to quantify the differences between four different methods used to treat patients in our clinic.
Methods: The planning approaches were compared based on total combined dose form external beam and brachytherapy, to 90% (D90) of the Clinical Target Volume (CTV) and highest dose to 2cm2 (D2cc) of the organs at risk (OAR).
Method A - used normalization to point A with 5-6 Gy/fraction, method B – used normalization to the rectum point receiving the highest dose of 2-2.5 Gy/fraction, method C – used optimised volumetric planning of 5-6Gy/fraction to the CTV while limiting dose to the OAR by making use of optimization (using Inverse Planning Simulated Annealing (IPSA)) and method D – used graphical (manual) optimization of 5-6 Gy/fraction to the CTV while limiting the dose to the OARs.
Results: The CTV D90 dose for method A, B, C and D respectively, calculated in equivalent dose in Gy fractions (EQD2) were 85.70±8.96Gy, 60.87±2.86Gy, 79.73±2.36Gy, 82.52±3.49Gy. For the OARs the D2cc to the bladder was 92.56±7.65Gy, 60.30±2.68Gy, 75.28±5.89Gy, 76.61±4.03Gy, to the rectum 72.62±2.26Gy, 55.70±0.41Gy, 64.71±5.69Gy, 67.61±4.03Gy, to the sigmoid 60.93±3.58Gy, 53.75±1.27Gy, 58.65±5.80Gy, 60.24±6.98Gy, and for the small bowel 74.79±7.54Gy, 56.01±2.17Gy, 67.79±1.71Gy, 70.22±1.09Gy.
Conclusion: Target doses above 80 Gy was achieved for method A, C and D, whereas method B did not reach such a high dose. For the OARs, the bladder and small bowel both received ±10 Gy above the tolerance dose in method A and ±5 Gy for method D. With method C and D, although more labour intensive, much better tumour control can be achieved without violating OAR tolerances

Keywords: Brachytherapy, Planning, Optimization

CR -29

Title: **KNOWLEDGE OF CERVICAL CANCER, HUMAN PAPILLOMAVIRUS AND PREVENTION AMONG FIRST-YEAR FEMALE STUDENTS IN RESIDENCES AT THE UNIVERSITY OF THE FREE STATE**

Authors: N Mofolo, M Sello, M Leselo, N Chabanku, S Ndlovu, Q Naidoo, G Joubert
Department: School of Clinical Medicine
Presenter: Nathaniel Mofolo

Background: Cervical cancer is the second most common cancer among women in South Africa. One of the major risk factors for the development of cervical cancer is the human papillomavirus (HPV).
Aim*:* To determine the knowledge of first-year female students living in residences on the main campus of the University of the Free State (UFS) regarding cervical cancer and HPV.
Setting: Female residences on the main campus of UFS.
Methods: A descriptive cross-sectional study was conducted on participants between the ages of 18 and 25 years using a non-random convenience sampling method. Seven residences were included. Anonymous self-administered questionnaires were distributed during the evening meetings to all first-year female students at the selected residences after an information session. Students had to complete the questionnaires immediately after the meeting.
Results: Most of the 373 respondents (85.8%) knew that cervical cancer arises from the cervix, but only 15.4% knew that it was caused by a virus. Of the 62.5% participants who knew that HPV was a cancer-causing virus, most correctly knew that HPV was contracted by unprotected sexual intercourse (81.1%) and that there is a vaccine to protect against HPV (73.1%). However, 2.0% knew that the vaccine was available in South Africa and only 31.0% knew the vaccine was free of charge.
Conclusion: The study revealed that students had limited knowledge of cervical cancer, HPV and vaccine availability.

Keywords:

CR -30

Title: **ADEQUACY OF ORAL ENERGY AND PROTEIN INTAKE IN A PRIVATE INTENSIVE CARE UNIT**

Authors: VL van den Berg, A Kloppers, , M Nel
Departments: Nutrition and Dietetics, Biostatistics
Presenter: Louise van den Berg

Introduction: Disease related malnutrition is commonly recorded in acute care facilities worldwide. Its inegative impact on patient outcomes and treatment costs are well-documented. However, very few studies have investigated this problem in the African context. This study aimed to assess the adequacy of energy and protein intakes of exclusively orally fed patients in the intensive care unit (ICU) in a South African setting.
Methods: An observational cross-sectional study was conducted. Actual total energy and protein intakes of 26 eligible trauma participants (15 receiving a ward diet, 11 receiving a ward diet and oral nutritional supplements (ONS) were assessed over a study period of 14 consecutive days (resulting in 98 observation points) in a multi-ICU of a private hospital in Gauteng, and compared to calculated requirements.
Results: Participants not receiving ONS met 98% of energy, but only 68% of their protein requirements. The more nutritionally vulnerable group that had been prescribed ONS, met 57.2% of energy and 53.7% of protein requirements without ONS, and still only 76.4% of energy and 74.3% of protein requirements if the ONS was included in the calculation (p<;0.05). When divided per body mass index (BMI), the subgroup with BMI <30 kg/m^2 (n=19) had inadequate median intake for energy and protein, with and without ONS. For the obese subgroup with BMI ≥30 kg/m^2 (n=7), however, energy intake exceeded requirements by 23.6%, despite their protein intakes only meeting 64.1% of their requirements.
Conclusion: The oral intakes of ICU patients on ward diets were inadequate in particularly protein, even in those prescribed ONS based on their requirements. These results idicate that specific consideration to optimise protein delivery in the critically ill patient is needed. Particularly the obese critically ill patient needs special attention to avoid exceeding energy requirements without meeting protein needs.

Keywords: trauma patients, energy, protein

CR -31

Title: **INTRAVENOUS LIGNOCAINE FOR PERIOPERATIVE ANALGESIA – A SYSTEMATIC REVIEW IDENTIFYING CURRENT APPLICATIONS AND FUTURE POTENTIAL.**

Authors: JG Vorster, BJS Diedericks
Departments: Anaesthesiology
Presenter: Johannes Vorster

Background: Opioid-sparing analgesia has become the standard of care for perioperative analgesia. Lignocaine as an IV infusion is an attractive option for inclusion in such regimes due to its ease of administration and good safety profile.
Aim: The majority of practitioners in our institution are uncertain of the role of IV lignocaine in perioperative medicine. To clarify this we conducted a systematic review with the research question: In patients undergoing anaesthesia for surgery, does I.V. lignocaine infusions for peri-operative analgesia, compared to conventional modalities of analgesia, decrease those analgesic requirements and adverse effects?
Methods: The PRISMA statement for writing systematic reviews was followed in writing this review. Due to time and financial limitation, the search was limited to the PubMed database. A yield of 14 articles was included for review. Article results were tabulated and a score given for the level of strength for each article and a qualitative appraisal done of each article. The report
highlights the important findings.
Results: There is a large body of evidence to support the use of this intervention for perioperative analgesia in predominantly abdominal surgery. Optimal results are achieved if it is used as an adjunct rather than a sole analgesic. There exists large paucity in the literature regarding its use in all surgical disciplines.
Conclusion: IVI lignocaine should be included in any opioid-sparing multi modal perioperative analgesic regime - along with paracetamol, NSAIDs and gabapentanoids - in the surgical groups where it has been shown to be effective. It is an excellent rescue analgesic when other conventional modalities are contraindicated or failed. Further high quality prospective trials are needed, in the surgical disciplines lacking literature, to support or refute its use.

Keywords: Intravenous, Lignocaine, Analgesia

CR -32

Title: **PREDICTING PHYSICAL EXERTION ON GRADED HIKING TRAILS**

Authors: B Coetzee
Department: Exercise and Sports Science
Presenter: Brenda Coetzee

Introduction and aim: Lack of information regarding the fitness required to complete a hiking trail creates perceived and real danger, potentially leading to health risks for inexperienced hikers. The link between current fitness levels of potential hikers and energy expenditure on graded hiking trails is investigated; specifically to determine if simple, pre-hike fitness or physical activity (PA) tests can be used to predict physical exertion on graded hiking trails.
Methodology: A Prospective Descriptive design was used in this study. Fifty (n=50) participants completed pre-hike tests and two hiking trails. Correlations between relevant sets of variables were calculated, together with the associated p-value. ANCOVAs were used to investigate if the exertion levels on the two trails, as characterised by the minimum heart rate (HR), average HR, maximum HR and Borg Scale (rate of perceived exertion) at the end of the trail, could be predicted by the pre-hike fitness/PA tests.
Results: The analyses of data for both trails separately, and then jointly, yielded essentially similar results: For Trail 1, the Step-up Test was selected as the only predictor of both average HR ($p=0.0026$) and maximum HR ($p=0.0015$). Similarly, for Trail 2, the Step-up Test was the selected predictor of average HR ($p=0.0607$), and it was the only selected predictor for maximum HR ($p=0.0070$). A statistical model was created that predicts the average HR and maximum HR of hikers undertaking an easy and a moderate hike. The results of such predictions can be used to recommend hiking trails to hikers with varying fitness levels for safe use.
Conclusion: The use of a standardised grading system linked to PA and fitness tests will assist hikers in making informed decisions regarding hiking trails that are suitable for them in terms of required fitness needed to complete the trail without excessive physical exertion.

Keywords: Hiking, Physical Exertion, Fitness

CLINICAL POSTERS

CP -1

Title: **THE ACCESSIBILITY OF SECONDARY SCHOOLS FOR LEARNERS WITH MOBILITY LIMITATIONS.**

Authors: H.W. Nel, R. Smith, S. Crafford, M. de Bruyn, A. de Lange, H. Oosthuizen, J. van Zyl, M. Venter, L. Vermaak

Departments: Physiotherapy

Presenter: Heleen Nel

Introduction: The South African constitution declares that all South Africans have the right to basic and accessible education. To ensure this, physical facilities at public schools need to be accessible to all learners with physical mobility limitations. Accessibility of secondary schools, and challenges faced by learners with physical mobility limitations within the school environment in South Africa is largely unknown.

Aim: To determine the accessibility of secondary schools in Bloemfontein for learners with physical mobility limitations. An additional objective was to identify challenges faced by learners with physical mobility limitations when mobilising in the school environment.

Methodology: Thirteen randomly selected Bloemfontein secondary schools were recruited into Phase I of this descriptive, observational study. Physical facilities were evaluated in line with the National Minimum Uniforms Norms and Standards for School Infrastructure. Data on school infrastructure was collected using a self-developed questionnaire. Thirty four learners with physical mobility limitations at a Bloemfontein special school were purposively recruited into Phase II, where challenges with regards to accessibility was evaluated using a self-developed questionnaire. Ethical clearance from the Health Sciences Research Ethics Committee (UFS-HSD2016/1314) and permission from the Free State Department of Education was obtained.

Results and Discussion: Phase I collected data from 13 secondary schools. All schools with multiple storied buildings (n=11) had stairs, with only 18,2% having ramps. The majority of schools (n=8) had parents also with disabilities. Most schools' toilets (n=12), tuck shops (n=9) and playgrounds (n=9) were inaccessible to learners with physical mobility limitations. Phase II collected data from 11 learners. Learners reported challenges with accessibility relating to tuck shops (n=5) and hallways (n=3).

Keywords: Accessibility, Learners, Mobility limitations

CP-2

Title: **SECOND- AND THIRD-YEAR MEDICAL STUDENTS' SELF-REPORTED ALCOHOL- AND SUBSTANCE USE AND SMOKING HABITS AT A SOUTH AFRICAN MEDICAL SCHOOL.**

Authors: AM Gerber, A Vorster, LJ van der Merwe, S van Zyl

Departments: Basic Medical Sciences, Undergraduate Programme Director

Presenter: Annelize Vorster

Introduction and aim: High percentages of health professional students use alcohol and narcotics. These trends are concerning considering the impact on academic performance as well as professional behaviour. The study aimed to determine self-reported alcohol- and substance use and smoking habits, as well as associated academic performance among preclinical medical students.

Methodology: An observational, descriptive, cross-sectional study design was used. Students voluntarily completed an anonymous questionnaire. Information regarding demographics, self-reported academic performance, drinking- and smoking habits and use of substances were obtained.

Results: One hundred and seventy one students completed the questionnaire. A total of 78.4% of the 2nd year- and 82.8% of the 3rd year students reported using alcohol. Twenty-two percent of the 2nd years and 24.1% of 3rd years reported cannabis use. In the 2nd year group, three (2.7%) students reported the use of magic mushroom, two (1.8%) cocaine, two (1.8%) ecstasy and one (0.9%) methamphetamine. Only 3rd year students reported using LSD (5.17%) or 'crack' (3.45%).

Conclusion: The results of this study's self-reported alcohol- and drug abuse and cigarette- and water pipe smoking among medical students is of great concern. Additional student support, early identification and referral for management of drug- and alcohol abuse should be a priority. A previous study involving first year medical students and assessing capabilities and functionings, identified the following possible stressors: Academic stressors, e.g. testing and evaluation; fear of failure with regard to training; workload and personal/social stressors, e.g. economic problems; unhealthy eating habits; physical inactivity; limited social interaction.

Keywords: Alcohol, substance, medical students

CP-3

Title: **LIFESTYLE CHANGE ALONE SUFFICIENT TO LOWER CHOLESTEROL IN MALE PATIENT WITH MODERATELY ELEVATED CHOLESTEROL – A CASE REPORT**

Authors: WJ Janse van Rensburg

Departments: Human Molecular Biology Unit, Department of Haematology and Cell Biology

Presenter: Wattie Janse van Rensburg

Introduction: Cardiovascular disease is a major cause of deaths in South Africa. Elevated cholesterol levels to above the normal reference range is a major risk factor for developing cardiovascular disease. Current guidelines recommend the use of cholesterol-lowering drugs to lower cholesterol levels to within the normal reference range. However, The American Heart Association further recommends a change in lifestyle in managing cholesterol levels. Thus, cholesterol-lowering drugs may not be needed, if a lifestyle-change alone is sufficient in lowering cholesterol levels to within normal ranges.

Case report: We report a case of a 33-year old male, with moderately elevated cholesterol levels, and a family history of cardiovascular disease.

Method: The subject followed an altered healthy fat diet accompanied with moderate exercise for six weeks, without the addition of any cholesterol-lowering agents.

Results: At 6-week follow-up the subject was able to decrease his total-cholesterol by 40.25% and his low-density lipid (LDL) cholesterol by 52.8%, to within normal ranges. The cholesterol levels remained within normal ranges after 6 months.

Conclusion: We can conclude that a lifestyle change alone was sufficient to lower moderately elevated cholesterol levels in this individual. This serves as an example that lifestyle change alone can be sufficient to lower elevated cholesterol levels. However, genetic and physiological differences may result in a different outcome in other individuals.

Keywords: Cardiovascular disease; Hypercholesterolemia; diet

CP-4

Title: **VALIDATION OF A GAMMA CAMERA MODELLED WITH SIMIND MONTE CARLO CODE**

Authors: M Qebetu, J Van Staden, H Du Raan, K Ramonaheng

Department: Medical Physics

Presenter: Milani Qebetu

Introduction: Dosimetry for targeted radiotherapy requires accurate activity quantification from gamma camera studies. Accurate activity quantification is cumbersome to achieve due to several effects that lead to errors in activity estimates. These effects can be studied using Monte Carlo simulations. The aim of this study was to validate a gamma camera modelled by the SIMIND Monte Carlo program.

Materials and Methods: The modelling and validation of a Siemens gamma camera fitted with a low-energy, high-resolution (LEHR) collimator was done by measuring and simulating certain NEMA performance measurements. These measurements were performed without (intrinsic) and with (extrinsic) LEHR collimators for Tc-99m. (i) Energy spectra from point sources in air were compared intrinsically and extrinsically. (ii) Extrinsic spatial resolution was obtained from two line sources at 10 cm distance from the detector head. (iii) The sensitivity and septal penetration were obtained from a flat circular source at various distances from the detector. All simulated and measured data were processed and the results compared.

Results:.

The intrinsic energy resolutions for the measured and simulated energy spectra were calculated to be 9.3 % and 10.0 % respectively. The corresponding values for the extrinsic energy resolutions were 9.6 % and 10.0 %. The Full-Width-at-Half-Maximum for measured and simulated system spatial resolution were 7.3 ± 0.04 mm, versus 7.0 ± 0.02 mm. The percentage difference between simulated and experimental sensitivity value was 13.7 %, attributed to a dose calibrator error. The corresponding measured and simulated values for the septal penetration were 2.0 % and 1.0 %.

Conclusion:Results obtained with the SIMIND MC code agree well with experimental results measured with Tc-99m on the Siemens gamma camera fitted with LEHR collimators. It is thus evident from this study that the SIMIND MC code can be used with confidence to mimic planar and SPECT studies.

Keywords: SIMIND, Monte Carlo Simulations, Activity quantification

LABORATORY PAPERS

LR -1

Title: **MODELLING OF ELECTRON BEAMS PRODUCED BY A MEDICAL LINEAR ACCELERATOR**

Authors: KN Sachse, FCP du Plessis
Departments: Medical Physics
Presenter: Karl Sachse

Introduction and aim: Different approaches have been made towards the modelling of radiation beams produced by linear accelerators (linac) for the use in Radiotherapy treatment planning. The main objective for this study was to develop and validate an accurate Monte Carlo based model of the electron beam delivery system of an Elekta Synergy® 160-leaf Agility™ linac and to validate it with measured data.
Methodology: The EGSnrc/BEAMnrc package was used to accurately model the linac according to vendor specified information under a non-disclosure agreement, and the EGSnrc/DOSXYZnrc package was used to model a unit-density water phantom for electron dose calculations. The same electron beam setups simulated were also measured using ionization chambers in a water tank and GAFCHROMIC® XR-RV3 film placed within a Perspex mini phantom. The subset of data included central axis percentage depth dose curves, inline and crossline beam profiles and relative output factors for six electron beam energies, eleven field sizes and two source-to-surface distances. Gamma index evaluations were performed with a 2%/2mm tolerance criterion.
Results: The individual components within the linac could accurately be modelled using the component structures offered in the BEAMnrc code system. Unknown initial electron beam properties such as the focal spot size and shape as well as the initial energy spectrum had to be investigated and the best combination of properties were iteratively obtained from simulations. Once the model was precisely adjusted, simulated data complied with measured data within the set criterion. An experimental asymmetric energy spectrum with a low-energy tail was used to describe the initial electron beam, which solved dose discrepancies in the dose build-up region.
Conclusion: The EGSnrc user code could successfully be utilized to develop an electron model which after some fine modifications simulated data that was able to meet the tolerance criteria.

Keywords: Linear accelerator, electron modelling, EGSnrc

LR -2

Title: **IDENTIFICATION OF ARBOVIRUSES CIRCULATING IN MOSQUITO POPULATIONS IN THE BLOEMFONTEIN AREA: MOSQUITO IDENTIFICATION AND METEOROLOGICAL DATA.**

Authors: GIduP Terblanche, A Kemp, FJ Burt
Departments: Virology, Institute for Communicable Diseases, NHLS
Presenter: Gert Terblanche

Introduction:Globally there are more than 3500 different species of mosquito. Many of these mosquitoes are found in close proximity to humans. Mosquitoes are known to be the primary insect vectors of many medically important diseases. Currently the diversity of mosquito populations circulating in the Bloemfontein area is not well defined.
Aim: To collect and identify mosquito species that are circulating in the Bloemfontein area using morphological and molecular techniques. All of this was done against the backdrop of changing meteorological data of the Bloemfontein area for the years 2016 - 2017.
Methodology: Mosquitoes were collected over a two year period from three sites surrounding Bloemfontein using a carbon dioxide baited Shannon trap. Mosquitoes were identified morphologically using entomological keys specific for South African mosquitoes. For each species, two to five mosquitoes were selected for genetic identification. DNA was extracted from the legs of selected specimens of each species. PCR was performed using a set of barcoding primers targeting the Cytochrome oxidase b I gene. The sequence data was compiled and compared to known reference sequences retrieved from GenBank. Meteorological data was obtained from the National Weather Service and analysed to determine trends in the weather over the last 2 years.
Results: A total of 327 specimens were identified to species level using morphological keys. Thirteen different species were identified, with Anopheles squamosus and Culex theileri being the most abundant. The identity of five species was confirmed by aligning the sequence data from representative mosquitoes to known reference sequences. Above average temperatures were reported for the last two years and the rainfall was very low with Bloemfontein going through a drought.
Conclusion: The mosquito populations in Bloemfontein prove to be very diverse. The presence of potential disease vectors in the Bloemfontein area, in addition to changes in weather can lead to the emergence of mosquito-borne virus infections. The mosquitoes are currently being screened for evidence of arbovirus infection.

Keywords: Mosquito, Barcoding, Morphology, Cytochrome oxidase b I gene

LR -3

Title: **THE DEVELOPMENT AND VALIDATION OF A REVERSE TRANSCRIPTION RECOMBINASE POLYMERASE AMPLIFICATION ASSAY FOR DETECTION OF FLAVIVIRUSES IN SOUTH AFRICA.**

Authors: EH Bonnet, FJ Burt
Departments: Virology
Presenter: Elise Bonnet

Background and aim: Nucleic acid amplification methods, such as reverse transcription recombinase polymerase assay (RT-RPA), which do not require specialised equipment, would have application in low resource settings or for field work. The aim of this study was to develop and validate a RT-RPA for the detection of South African flaviviruses using West Nile virus (WNV) to optimise the reaction.
Methodology: A 371 base pair conserved region of the NS5 gene of WNV was targeted. An RT-RPA probe was designed and modified by addition of biotin to the 5' end to facilitate detection using lateral flow strips containing biotin antibodies that bind to the biotin conjugated amplicons. A control to optimise the assay was prepared by transcribing RNA using a synthetic gene as template cloned into pGEM-T easy upstream of a SP6 promoter. RT-RPA conditions were optimised using the RNA control and Twistamp nfo kit. Minimum detection level was determined using 10-fold dilutions of known copy number of transcribed RNA.
Results: Transcribed RNA was initially confirmed using a conventional RT-PCR and amplification of a 371bp product visualised on an agarose gel. Optimal results were obtained from RT-RPA using transcribed RNA, primer, probe and performed at 40°C for 20 minutes. Amplicons were detected using lateral flow strips and confirmed by purification of the amplicons and visualised using agarose gel electrophoresis.
Conclusion: Transcribed WNV RNA was used to optimise a RT-RPA with detection of products on lateral flow strips. The assay can be performed without sophisticated equipment and hence has application in low resource settings or field work.

Keywords: Flaviviruses, RT-RPA, Lateral flow assay

LR - 4

Title: **PREVALENCE OF SINDBIS VIRUS INFECTIONS IN THE FREE STATE**

Authors: N Kennedy, D Goedhals, FJ Burt
Department: Virology
Presenter: Nicole Kennedy

Introduction and Aim: Sindbis virus (SINV) is a mosquito-borne virus associated with chronic arthritis and is endemic to South Africa. The exact prevalence in South Africa is not known and the association of arthritis is not well documented in South Africa. The aim of this study was to develop an in house ELISA for the detection of IgG antibody against SINV, to compare its performance against a commercial assay, and to screen select populations for evidence of previous infection.
Methodology: An in house ELISA was developed. Briefly a SINV cell lysate antigen and mock antigen were used to coat 96 well ELISA plates. The concentrations of each reagent were determined by checkerboard titration. A suitable cut off point to distinguish between negative and positive samples was determined from a panel of negative control samples. The ELISA was used to screen 165 stored serum samples collected from patients attending a local arthritis clinic in Universitas Hospital, 266 stored serum samples from patients with acute febrile illness, suspected of tickbite fever and with no diagnosis, as well as 136 serum samples from high risk populations (horse and stable workers in Bainsvlei area). The positive samples were tested using a commercial immunofluorescence assay (IFA).
Results: The results indicated that 31/165 samples from patients attending arthritis clinic, 13/136 samples from high risk populations, and 25/266 samples from acute febrile illness patients with no diagnosis tested positive for SINV antibodies using the in house ELISA. Commercial IFA results were as follows: 46/69 samples tested positive, 15/69 samples tested negative and 8/69 samples were indeterminate.
Conclusion: The results will be confirmed using a neutralisation assay. However the ELISA was more sensitive and is simpler to automate for surveillance. The prevalence of IgG antibody in targeted populations suggests more frequent occurrence of undiagnosed Sindbis virus infections.

Keywords: ;Sindbis, arbovirus, ELISA

LR -5

Title: **RADIOTHERAPY TREATMENT VERIFICATION: LOGFILES AS AN ALTERNATIVE TO MEASUREMENTS**

Authors: LJ Strauss, A van Eck, W Shaw
Departments: Medical Physics, High Performance Computing Unit
Presenter: Lourens Strauss

Introduction: Various detectors are available for linear accelerator (linac) and patient specific quality assurance tests. Although detector resolution is typically larger than measurement resolution, they should identify linac component positional deviations. Linacs operate under strict mechanical tolerances while recording actual component parameters in logfiles. In this study the correlation and sensitivity of different 2D array detectors and logfiles are tested extensively.
Methods: The Elekta© test beam package for Agility Multileaf Collimator (MLC) as well as clinical plans (Prostate, Nasopharynx and Brain) were measured with 3 different commercial detector systems whilst logging. A novel software package was developed to extract and filter logfile data for easy measurement comparison. Subsequently, intentional MLC bank offsets of ±0.2, ±0.5 and ±1mm were introduced, while the same measurements were repeated. An assessment was made to validate mutual information in all verification methods, as well as identifying variations in component set values.
Results: The measurements confirmed logfile data for the original test beam package as well as clinical plans. All methods could also verify the introduced errors at the level of ±0.2mm. The logfiles are sensitive to the level of 0.1mm in MLC and Jaw positional accuracy. Static MLC leaf stability was found to be ±0.1mm and the Jaws ±0.2mm. The largest MLC positional deviations were logged during fixed aperture arc beams and ranged from 0.7-1.3mm. These were always corrected within 25ms, confirmed by detector measurements. The detectors also confirmed output fluctuations recorded in the logfiles.
Conclusion: A high degree of correlation was found between these verification techniques and the logfiles. Differences in the detector systems' capabilities were also identified. All were able to detect very small component errors required for accurate dosimetric verification. Logfiles can be a very effective alternative for radiotherapy plan verification.

Keywords: 2D array, logfiles, verification

LR -6

Title: **COMPLETE GENOME SEQUENCE AND COMPARATIVE ANALYSIS OF HUMAN PAPILLOMAVIRUS TYPE 18 ISOLATED FROM A HEAD AND NECK CANCER BIOPSY**

Authors: Y Munsamy, RY Seedat, PA Bester, FJ Burt
Departments: Virology, Otorhinolaryngology, NHLS
Presenter: Yuri Munsamy

Introduction and aim: Limited genome data is available for human papillomavirus (HPV) implicated in the aetiology of head and neck squamous cell carcinoma (HNSCC). This study aimed to obtain and characterise the first whole genome sequence of an HPV 18 isolate from a patient with nasopharyngeal carcinoma using next generation sequencing (NGS).
Methodology: The complete genome sequence of HPV 18, designated VBD17/15, amplified from a patient with histologically confirmed nasopharyngeal carcinoma was determined using NGS. Phylogenetic relationships were inferred using reference strains for lineages A, B and C and sublineages A1–5, B1–3. Variations were identified by alignment with the reference strain. Multiple sequence alignments with HPV 18 whole genomes from cervical carcinomas were sorted according to variant lineage/sublineage to visually differentiate lineage/sublineage-specific SNPs.
Results: Comparison of 125 whole HPV 18 genomes indicated that VBD 17/15 mapped to the HPV 18 Lineage A1, with 99.8% nucleotide identity to the reference strain. A 4bp transversion identified in the E2 gene (TGCG→GCGT), resulted in an amino acid change from alanine to arginine. VBD17/15 displayed a unique change, T4315A transversion in the L2 gene.
Four amino acid changes were identified within the genome of VBD17/15: one in E6, one in E1/E2 and two in E2. One novel amino acid change was detected in the L2 protein coding sequence.
Regarding lineage specific SNPs, lineage C-specific SNPs were densely distributed throughout the whole genome, which is reflected in the phylogenetic distance of lineage C from other lineages.
Conclusion: Mutations novel to an HPV 18 isolate associated with nasopharyngeal carcinoma were identified. The change from trytophan to arginine, a hydrophilic amino acid, may influence papillomavirus assembly and the infectious process. Sequence diversity and phylogenies of HPV 18 provide the basis for future studies investigating genetic variation in HPV epidemiology and head and neck carcinogenesis.

Keywords: Human papillomavirus, Next generation sequencing, HPV18

LR -7

Title: **VALIDATION OF A RAPID VON WILLEBRAND FACTOR PROPEPTIDE ASSAY**

Authors: RB Maleka, SM Meiring
Departments: Haematology and Cell Biology
Presenter: Rethabile Maleka

Introduction: von Willebrand disease (VWD) is the most common inherited bleeding disorder caused by a deficiency or defect in von Willebrand factor (VWF). The qualitative defects include, type 1 VWD (partial deficiency) and type 3 VWD (complete deficiency). Type 1 VWD is either due to decreased synthesis and secretion or increased clearance of VWF. It is essential to diagnose individuals with an increased clearance rate of VWF, as treatment of these patients with 1-deamino-8-D-arginine vasopressin is not effective. The ratio between the von Willebrand factor propeptide (VWFpp) and von Willebrand factor antigen (VWF:Ag) is used to identify type 1 VWD with increased clearance. Currently, there is only one commercial assay that measures VWFpp levels. This assay is not only too expensive but is also time consuming.
Aim: With this research we developed and validated a rapid assay to determine VWFpp levels in patients' plasma.
Methodology: The commercial antibody pair CLB-Pro 35 and CLB-Pro 14.3 was used in an enzyme-linked immunosorbent assay (ELISA). While the commercial assay uses two hour incubations, our rapid assay uses 30 minute incubations, a time reduction of 78%. We compared our assay to the commercial assay using plasma of 20 type 1 VWD patients. Two samples, the WHO 6th IS for FVIII/VWF in plasma and a known type 1 VWD patient with an increased VWFpp/VWF:Ag ratio were tested 4 times in duplicate for 5 consecutive days to determine the inter- and intra-assay precision.
Results: This rapid assay has equal sensitivity as the commercial assay of detecting 1.5625% VWFpp. The intra- and inter-assay CV's of our assay were less than 10% that is acceptable according to the Food and Drug Administration guideline of 2013 of less than 15%.
Conclusion: This rapid ELISA test is as sensitive and precise as the commercial ELISA method and can be used to diagnose patients with increased VWF clearance.

Keywords: Increase clearance, CLB-Pro 35 and CLB-Pro 14.3 mAb, Rapid ELISA

LR -8

Title: **EVALUATION OF IMAGE QUALITY AND DOSE IN MAMMOGRAPHY USING CENTRAL COMPOSITE DESIGN**

Authors: M Moller, S Acho
Department: Medical Physics
Presenter: Mia Moller

Introduction & Aim: A central composite factorial experiment with two variables was preformed to determine if the average glandular dose (AGD) can be reduced and the image quality maintained by adjusting the kilovoltage peak (kVp) and tube current time product (mAs) for breast thicknesses of 4.5, 5.5 and 7.5 cm. This was done by investigating the factors that influences the image quality and AGD by using a central composite design. A central composite design is when more than one factor at a time is varied to determine the interactions between factors. The major effects that the factors have on the response variables (AGD and image quality) as well as the interaction effect were studied.
Materials and Methods: The CDMAM (3.4) phantom was exposed using automatic exposure control (AEC) on the Hological digital mammography unit available in Universitas Academic hospital. Three different breast thicknesses were simulated using PMMA (4.5, 5.5 and 7.5 cm). The optimal parameters were established from AEC. The mAs and kVp were then adjusted accordingly. The image quality was calculated using CDCOM (1.6) software.
Results and Discussion: The kVp and mAs had a big influence on the image quality and dose. The interaction between kVp and mAs mainly influenced the dose. The optimal parameters for each breast thickness was establish using overlaid contour plots. The verification images that were taken with the optimal settings had lower AGD and better image quality.
Conclusion: The study shows that optimization in mammography is possible by using a central composite design.

Keywords; Diagnostic Radiology, Mammography, Optimization

LR -9

Title: **ESTABLISHMENT OF RADIOCHROMIC FILM CALIBRATION CURVES FOR RADIONUCLIDES IN NUCLEAR MEDICINE.**

Authors: J van Tonder, EC Botha, K Ramonaheng
Departments: Medical Physics
Presenter: Johanet van Tonder

Introduction: Radiochromic film has proven to be successful for measuring dose in radiotherapy and diagnostic radiology, and thus may be applicable to nuclear medicine. Its success in the application of dosimetry for nuclear medicine, lies in the ability to relate activity to film darkening. In order to achieve this, isotope specific calibration curves must be set up. Aim: The aim of this study was to verify whether Gafchromic XRQA-2-film may be used to measure radioactivity of radionuclides used in nuclear medicine.
Materials and methods: Segments of Gafchromic XRQA-2-film were exposed to I-131 and Tc-99m in vials and a sealed Am-241 source, for various periods of exposure times. Exposures were repeated three times and maximum pixel values, that indicate film darkening, were plotted as a function of cumulated activity and exposure time (MBq·h).
Results: Film darkening was observed after exposure to radioisotopes. Calibration curves were obtained and both the Rodbard function and Gamma Variate function were successfully fitted to the data. The Rodbard fit had high regression values of 0.99931 and 0.99960 for the I-131 curve Am-241 curve respectively, whereas the Gamma Variate fit had a high regression value of 0.99928 for the Tc-99m curve. It was found that the film is energy dependent i.e. increased sensitivity for lower energy gamma rays. Film response to Am-241 and Tc-99m was found to be reproducible. As a result of beta and high energy gamma emission by I-131, longer exposures were required to achieve film darkening comparable to Tc-99m and Am-241.
Conclusion: The calibration curves can be used, if the setup is reproducible, to relate maximum pixel value to unknown activity and ultimately dose. The curves are only valid to a point of saturation, and are isotope specific. Further investigation is needed to determine film response to beta emission.

Keywords: Nuclear medicine, Activity measurement, Radiochromic film

LR -10

Title: **NON-STRUCTURAL CRIMEAN-CONGO HAEMORRHAGIC FEVER VIRUS PROTEIN PREVENTS IMMUNE ACTIVATION**

Authors: N Viljoen, D Goedhals, FJ Burt
Departments: Virology, NHLS
Presenter: Natalie Viljoen

Introduction and aim: Crimean-Congo haemorrhagic fever virus (CCHFV) causes severe disease and suppresses the innate immune response. CCHFV encodes various structural and non-structural proteins; however, the role of some CCHFV proteins remain unclear. The aim of this study was to investigate the role of the CCHFV NS_M protein in innate immune suppression.
Methodology: A codon-optimised CCHFV NS_M gene cloned into pcDNA3.1(+) was introduced into human embryonic kidney (HEK)-293 cells. After protein expression was confirmed, NS_M-expressing cells were harvested in RNAprotect Cell Reagent to preserve the RNA profile. RNA was extracted, the integrity and purity confirmed, and RNA transcribed to cDNA, which served as template for quantitative polymerase chain reaction (qPCR). Gene expression was normalised to the expression of glyceraldehyde-3-phosphate dehydrogenase (GAPDH), and gene modulation expressed relative to a negative control. Modulation of gene expression was determined using the delta-delta C_T method.
Results: The CCHFV NS_M protein from a non-reassortant South African isolate downregulated the expression of various innate immune response markers. The gene encoding the retinoic acid-inducible gene 1 (RIG-1) that is important for CCHFV recognition was downregulated 6-fold. The genes encoding interferon (IFN)-beta and the IFN-receptor were downregulated 4- and 2-fold, respectively, which play a crucial part in the innate immune response. The gene encoding the signal transducer and activator of transcription 1 (STAT1) that activates the IFN-response element that drives the expression of IFN-stimulated genes, which ultimately induces an antiviral state, was downregulated 2-fold.
Conclusion: The CCHFV NS_M protein contributes to the ability of CCHFV to suppress the innate immune response. The protein downregulates multiple innate immune response markers responsible for the recognition of the virus and subsequent activation of the innate immune response to induce an antiviral state. Without innate immune control, uncontrolled virus replication and spread throughout the host will occur, which may exacerbate disease.

Keywords: Crimean-Congo haemorrhagic fever, NS_M protein, Innate immune response

LR -11

Title: **DEVELOPMENT AND VALIDATION OF AN HIV DRUG RESISTANCE ASSAY USING DRIED BLOOD SPOT SAMPLES**

Authors: I Barakzai, PA Bester, J Frater, D Goedhals
Departments: Division of Virology, Faculty of Health Sciences, University of the Free State/NHLS; Nuffield Department of Clinical Medicine, University of Oxford
Presenter: Iqra Barakzai

Introduction and aim: South Africa has been reported to have the worst epidemic of human immunodeficiency virus (HIV) globally, with more than 7.1 million people estimated to be living with HIV in 2016. With improved access to treatment, levels of transmitted and acquired drug resistance are increasing. The availability of a drug resistance assay using dried blood spot (DBS) samples would improve access to laboratory testing for programmatic surveillance and patient management. The aim of this study was therefore to validate a Sanger sequencing assay for HIV drug resistance testing using DBS samples.
Methodology: An in-house Sanger sequencing HIV drug resistance assay was optimised to use DBS samples instead of plasma for nucleic acid extraction, using the EasyMag automated system. The assay was validated using the following parameters: 1) sensitivity, 2) specificity, 3) precision, 4) reproducibility and 5) accuracy.
Results: 86% of samples with a viral load >3000 RNA copies/ml were successfully amplified and all of these samples were sequenced, indicating acceptable sensitivity. Three negative HIV specimens were included in validation to ensure the assay does not produce false positive results. The assay successfully distinguished between positive and negative samples. Both precision and reproducibility were acceptable, with all the replicates showing >98% similarity at the nucleotide level. Accuracy was determined using thirteen samples with known HIV drug resistance profiles. Ten of the samples displayed >98% similarity, while two of the samples displayed 96% similarity at the nucleotide level. No differences were noted in the major resistance mutations and the mutations had no impact on the antiretroviral resistance profiles.
Conclusion: Specimens displayed similar resistance profiles when compared with the gold standard plasma assay and acceptance criteria were met for all paramters tested. The assay was therefore deemed acceptable for us in both the diagnostic and research laboratories.

Keywords: HIV drug resistance, Dried blood spot DNA extraction for HIV testing, Sanger sequencing

LR -12

Title: **SEROEPIDEMIOLOGIC SURVEY OF CRIMEAN-CONGO HEMORRHAGIC FEVER VIRUS IN SELECTED RISK GROUPS, SOUTH AFRICA**

Authors: S Vawda, D Goedhals, PA Bester, F Burt
Departments: Virology, NHLS
Presenter: Sabeehah Vawda

Introduction and aim: Crimean-Congo hemorrhagic fever virus (CCHFV), is a tickborne virus causing human disease in Africa, the Middle East, Asia, and southeastern Europe. Its seroprevalence differs geographically between and within these regions. CCHFV was first identified in South Africa (SA) in 1981 with sporadic cases reported subsequently.
While tick and animal studies in SA found a high prevalence of CCHFV and antibodies respectively, two human studies from the 1980's, conducted among farm workers, found low seroprevalences of 1.3% - 1.5%. The current seroprevalence in SA is unknown and it is unclear if subclinical cases occur. This study was performed to determine if the low seroprevalences previously identified among farm workers reflects the seroprevalence in other high-risk groups.
Methodology: A descriptive study was conducted in the Free State (FS) and Northern Cape (NC) provinces. Groups were selected based on risk of exposure due to occupational and/or recreational activity. A questionnaire including demographic, occupational and risk exposure data was completed for each volunteer. A total of 374 blood samples were collected from adult volunteers between April 2016 and February 2017, and 13 stored serum samples, collected from large animal veterinarians in 2012, were included. Specific IgG against CCHFV was detected using a commercial indirect immunofluorescence assay (IFA). All positive reactors were tested for IgM using IFA.
Results: A total of 2/387 participants had evidence of previous infection, without evidence of acute or recent infection. The two seropositive samples were collected from 27 year old, male abattoir workers, from an abattoir in rural FS. Neither participant reported any previous illness and both were healthy at the time the blood was collected.
Conclusion: This study conducted amongst groups at high-risk for CCHFV in endemic regions of SA, found that the seroprevalence of CCHFV remains low as previously shown, despite multiple potential routes of exposure in the cohort.

Keywords: Crimean-Congo hemorrhagic fever virus, Serosurveillance of CCHFV, South Africa CCHFV

LR -13

Title: **THE IN VIVO EFFECTS OF HIGH-DOSE STREPTOKINASE IN A PAPIO URSINUS BABOON MODEL OF ACQUIRED THROMBOTIC THROMBOCYTOPENIC PURPURA.**

Authors: J Joubert, WJ Janse van Rensburg, C Conradie, S Lamprecht, SM Meiring

Departments: Haematology and Cell Biology, National Health Laboratory Service, Universitas Academic Laboratories, Animal Experimentation Unit.

Presenter: Jaco Joubert

Introduction and aim: VWF multimer accumulation, central to the pathogenesis of TTP, is amenable to plasmin cleavage. The potential utility of the fibrinolytic drug streptokinase in the treatment of acquired TTP was demonstrated in humans in vitro, and in a mouse model in vivo, and was subsequently investigated locally in a pilot study using a Papio ursinus baboon model of acquired TTP. Results of this study suggested that streptokinase at doses higher than 900 000 IU may be required in this model to confirm proof-of-concept. We aimed to determine the in vivo effects of streptokinase in this model, at doses of 1 500 000 IU and higher.

Methodology: After induction of TTP with the anti-ADAMTS13 monoclonal antibody 3H9, high-dose streptokinase (1 500 000 to 3 000 000 IU) was administered intravenously to a 14 kg baboon, and the effects of streptokinase assessed on peripheral blood counts, fibrinolysis, and VWF multimer patterns.

Results: Administration of escalating intravenous streptokinase doses had no effect on the TTP phenotype, and only minimal effect on platelet counts, fibrinogen levels, fibrin(ogen) degradation products, PAP-complexes and VWF multimer patterns. Plasminogen levels dropped significantly after most streptokinase doses, suggesting possible consumption during fibrinolysis. However, plasmin activity curves and quantitative analyses showed meaningful increases from baseline only in the 30 minutes-post-dose samples suggesting a transient effect, with plasmin activity values only ranging from 0% to 12%.

Conclusion: Although streptokinase does appear to activate the fibrinolytic system in a Papio ursinus baboon model of acquired TTP, the resultant plasmin activity is low, with no effect on the TTP phenotype. This suggests fundamental differences between the Papio ursinus and human haemostatic systems, which require further investigation before streptokinase can be tested in human in vivo trials, or discarded as a therapeutic option.

Keywords: thrombotic thrombocytopenic purpura, baboon model, high-dose streptokinase

LR -14

Title: **ASSESSMENT OF GAMMA CAMERA CALIBRATION FACTORS FOR QUANTIFICATION OF NUCLEAR MEDICINE IMAGES**

Authors: EC Botha, K Ramonaheng, J van Tonder

Department: Medical Physics

Presenter: Elaine Botha

Introduction and Aim: Efforts towards activity quantification of SPECT images are aimed at achieving reliable dose calculations. One such effort in determining the activity uptake of Tc-99m within a patient is to obtain a calibration factor (CF) that converts image counts to activity. This study is aimed at determining a CF using four geometries: Sphere-in-air, sphere-in-water, a syringe and a cylinder. Results were compared to the NEMA sensitivity factor.

Methodology: True activity was measured with a dose calibrator. The spheres were filled with an activity concentration of 0.27 MBq/ml, the syringe with 2 MBq/ml and the cylinder with 0.052 MBq/ml. SPECT/CT images were acquired using clinical protocol on a Siemens Symbia T16. OSEM Flash 3D reconstruction software; with resolution recovery, TEW scatter correction and CT-based attenuation correction were used. The effect of different regions-of-interest (ROIs) on the CF was investigated; namely, a ROI with a 3 cm margin, to recover spill out counts, and a ROI drawn to actual size, as applied in clinical practice.

Results: The CFs, calculated with a 3 cm margin, were 91 cps/MBq, 103 cps/MBq, 90 cps/MBq and 93 cps/MBq for the sphere-in-air, sphere-in-water, the syringe and cylinder, respectively. The NEMA standard had a value of 98 cps/MBq. When the ROI was drawn to actual size, the CFs yielded; 72 cps/MBq, 76 cps/MBq, 58 cps/MBq and 81 cps/MBq, respectively. And the NEMA sensitivity factor was 61 cps/MBq.

Conclusion: A 3 cm margin yielded results that were comparable to the NEMA. The percentage difference amongst the geometries can be attributed to the discrepancy in the attenuation and scatter corrections for the in-air and water geometries. The sphere-in-water is the most representative of a clinical geometry, inducing the effects of scatter and attenuation. Of all the geometries, the sphere-in-water CF was the most comparable to the NEMA standard with a percentage difference of 4.9%.

Keywords: Nuclear medicine, SPECT/CT, Activity Quantification

LR -15

Title: **THE CONTRIBUTION OF LARGER REARRANGEMENTS IN BRCA1/2 TO FAMILIAL BREAST CANCER IN SOUTH AFRICA.**

Authors: KS Ntaita, J Oosthuizen, M Theron, NC van der Merwe
Department: Human Genetics
Presenter: Kholiwe Ntaita

Introduction and aim: Genetic alterations that occur in the familial breast cancer genes (BRCA1/2) may lead to truncated ineffective proteins. These mostly represent small deletions/insertions, nonsense mutations and splice-site mutations. A number of larger rearrangements have been documented internationally, but there are currently no frequency reports for South Africa. The aim is to determine the contribution of LGRs to the familial breast cancer mutation spectrum for South Africa.
Methodology: A total of 554 SA breast cancer patients (including 172 Black-, 120 Indian-, 67 non-Afrikaner Whites, 77 Afrikaner and 108 Coloureds) were screened for larger rearrangements using Multiplex Ligation-dependent Probe amplification (probe sets SALSA® P002-C1 & P087-C1 for BRCA1 with SALSA®P045-B3 & P077-A3 for BRCA2) or Next Generation Sequencing using the Oncomine™ BRCA Research Assay. A Pubmed search was performed to investigate the total contribution of larger rearrangements to the mutation spectrum of BRCA for the South African population.
Results: Four different larger rearrangements were detected (0.72%); three in BRCA1 (detected for 2 non-Afrikaner white- and 1 Coloured patient) with a single rearrangement detected for BRCA2 in an Indian patient. The mutations ranged from complete gene deletions to the duplication of a few exons. No rearrangements were detected for the Black nor Afrikaner populations. The literature revealed that a total of 813 patients have thus far been investigated. Of these, a mere six mutations (0.74%) were reported, with five involving BRCA1. All these represent pathological mutations which will result in the lack of a transcript.
Conclusion: Larger rearrangements involving BRCA1/2 are not common in the South African population. Although low, the spectrum includes internationally extremely rare deletions. With the advancement to Next Generation Sequencing, extreme care should be taken during analysis to accurately identify complete gene deletions. These should always be confirmed using alternative methodology.

Keywords: familial breast cancer, large genomic rearrangements, BRCA1/2

LR -16

Title: **SCREENING FOR MUTATIONS IN BRCA2 REVEAL BIALLELIC PATHOGENIC MUTATIONS FOR TWO FANCONI ANEMIA BABIES: A CASE STUDY.**

Authors: D Notani, J Oosthuizen, M Theron, NC van der Merwe
Department: Human Genetics
Presenter: Dorah Notani

Introduction and aim: Fanconi anaemia (FA) is a rare autosomal recessive genetic disorder resulting in impaired response to DNA damage. The condition is genotypically and phenotypically heterogeneous, characterized cytogenetically by chromosomal instability and breakage. Affected individuals typically manifest growth restriction and congenital physical abnormalities. Most progress to haematological disease including bone marrow aplasia. The disease has 21 complementation groups, of which the rare subtype FA-D1 is caused by bi-allelic mutations in the familial breast cancer gene BRCA2. This study describes the identification of two babies with FA, carrying various BRCA2 pathogenic mutations.
Methodology: DNA was extracted from blood received for the two triads (father, mother and child). Each of the individuals were screened for mutations in BRCA2 using genotyping assays and High Resolution Melting Analysis. Samples that deviated from the baseline were Sanger sequenced to confirm the presence of a variant. Clinical significance was determined based on the ENIGMA guidelines.
Results: Three pathogenic mutations were identified. For Family 1, the mother was heterozygous for the recurrent Xhosa/Coloured pathogenic mutation from the Western Cape (BRCA2 c.5771_5774delTTCA, p.Ile924Argfs*38), whereas the father carries a truncating mutation in exon 7 (BRCA2 c.582G>A, p.Trp194*). The baby was biallelic, for he carried both mutations, which confirmed a diagnosis of the rare subtype FA-D1. The mother representing Family 2 tested positive for a splice site mutation in intron 2, whereas the father carried the Xhosa recurrent mutation (BRCA2 c.5771_5774delTTCA, p.Ile924Argfs*38). The baby was bi-allelic as both mutations were identified, confirming the diagnosis.
Conclusion: Screening of BRCA2, a familial breast cancer gene, confirmed a diagnosis of the rare subtype FA-D1 in two babies. The presence of these pathogenic mutations proved to be lethal. Prenatal or partner testing has since been offered to these families for future pregnancies.

Keywords: BRCA2, Fanconi anemia, bi-allelic mutations

LR -17

Title: **VARIANT CLASSIFICATION: A DAUNTING TASK**

Authors: NC van der Merwe, M Theron, J Oosthuizen
Department: Human Genetics
Presenter: Nerina van der Merwe

Introduction and aim: Decades of familial breast cancer research and clinical testing have uncovered tens of thousands of BRCA1/2 genetic variants internationally. These variants range from pathogenic to those with unknown clinical significance, with the great majority being benign, conferring no increase in risk for cancer development. The American College of Medical Genetics (ACMG) issued guidelines for variant interpretation in an attempt to standardize results across diagnostic laboratories. This was needed as the specific class of a variant influence significant clinical decisions. Applying these mostly European and American based guidelines to a South African population with unique genetic backgrounds is complicated. This classification dilemma will be illustrated by reviewing a single case involving a truncating mutation detected for BRCA2.
Methodology: A total of 651 breast and/or ovarian cancer patients were screened for mutations in BRCA1/2 using High Resolution Melting Analysis (361 patients) or Next Generation Sequencing (300 patients). The variants detected were scrutinized using a multiple evidence based approach and the ACMG guidelines to confirm their clinical status and IARC class.
Results: A truncating mutation (BRCA2 c.9976A>;T, p.K3326X) was observed in exon 27. This variant was analysed using a combination of 15 international databases. In addition, a literature search was performed to obtain all information pertaining to this variant. The final classification varied from clinically likely benign to likely pathogenic, depending on the specific data base and interpretation.
Conclusion: Although more comprehensive guidelines are available, these guidelines still require personal experience and expert judgment in evaluating a variant's impact, therefore the classification of some may vary among laboratories. As VUS, likely benign and benign variants are not medically actionable, pathogenic and likely pathogenic variants are. This warrants consideration for additional screening, prevention or treatment options, as rigorous and consistent variant interpretation is critical to patient care.

Keywords: BRCA1/2, familial breast cancer, variant classification

LR -18

Title: **RESERVE STEM CELL POPULATION IN INTESTINAL CRYPTS FOUND TO BE CONSISTENTLY SMALL BY ANALYSIS OF IN VIVO CLONOGENIC ASSAYS WITH A BIOMATHEMATICAL DYNAMIC MODEL**

Authors: W Shaw, E Bahn, M van Heerden, J Gueulette, J P Slabbert, J Debus, M Alber
Departments: Medical Physics UFS; Radiation Oncology and Radiation Therapy, Heidelberg; Radiobiology Laboratory,Brussels; iThemba LABS, Somerset West
Presenter: Willie Shaw

Introduction and aim: The high plasticity of the intestinal epithelium is maintained by a resilient reserve stem cell population, whose extent and biology are a matter of ongoing debate. The in vivo clonogenic assay (IVCA), presents a well established and efficient analysis of radiation insult to the intestinal crypts. However, inadequate mathematical analysis in the past has led to systematic errors and contradictory results in estimates of radiosensitivity and size of the reserve stem cell pool.
Methodology: A refinement of the IVCA via development of a biomathematical model was devised that delivers a full statistical dynamic description of epithelial radiation injury and subsequent regeneration. This model was validated against cellular and crypt distribution statistics from IVCA experiments and through systematic re-analysis of experimental data from 27 publications.
Results: A full dynamic description of the evolution of stem cell niche population statistics is obtained. A systematic re-analysis reveals a consistent clonogenic content of the crypt of 31 ± 6 cells. The stem cell reserve manifests to be, contrary to prior predictions, radio-resistant: $\alpha = (0.22 \pm 0.04)\ Gy^{-1}$.
Conclusion: We established a precision tool for the quantitative analysis of radiation insult to the intestinal crypts, which we employ to show that the reserve stem cell population is small, radio- resistant, and remarkably immutable against a large variety of interventions. The increased resolution of the model allows not only a reduction of the number of animals by about 75 %, but also to quantify experimentally the influence of additional agents on damage and on regeneration of the stem cell niche.

Keywords: Intestinal Crypt, Stem cell, Clonogenic assay

LR -19

Title: **SURVEILLANCE OF WILD CAUGHT BIRDS FOR FLAVIVIRUS INFECTIONS IN THE LOWVELD REGION OF SOUTH AFRICA.**

Authors: TR Sekee, M Ndlovu, AD Perez-Rodriguez, E Bonnet, FJ Burt

Departments: Virology, Zoology and Entomology, School of Biology and Environmental sciences, University of Mpumalanga, National Health Laboratory Services

Presenter: Tumelo Sekee

Introduction and aim: Usutu virus (USUV) belongs to Flaviviridae family, genus Flavivirus. The virus was first isolated in South Africa (SA) in 1959. In 1996 the virus emerged in Italy and later throughout Europe causing large birds die-offs, mainly of blackbirds. Wild birds play a central role in flavivirus epidemiology as they represent the main amplifying hosts in the wild and may contribute to their dispersion through their migratory behaviour. Little information is available about the virus in SA and given that it was isolated in SA, it is important to understand its epidemiology and pathogenicity. Therefore the aim was to screen wild birds and look for evidence of the virus circulating by testing birds against USUV.

Methodology: A total of 54 blood samples were collected from various species of wild birds caught in the Kruger National Park (KNP). A commercial assay, anti-Usutu IgG kit, was used for screening blood samples. Briefly the wells on the ELISA plate are coated with a recombinant antigen, samples are incubated in the wells. In cases of positive samples for IgG, antibodies will bind to the antigens. To detect the bound antibodies, a second incubation is carried out using an enzyme-labelled goat anti-avian IgG catalyzing a colour reaction with a substrate.

Results: All wild birds captured were ringed using a uniquely marked SAFRING band and were released after being bled. A total of 2/54 (3.7%) bird samples tested positive for IgG against USUV.

Conclusion: The ecological and climatic changes and the possible adaptation of flaviviruses to new host species increase the potential of flavivirus emergence in previously unaffected regions of the world as is the case with USUV. The two positive samples may suggest that there is USUV circulating in KNP and therefore in SA. It warrants further investigation of birds and human population.

Keywords: Usutu virus, Wild bird USUV, Anti-Usutu Ig G Kit

LR -20

Title: **AN UPDATE AND EXPANSION OF THE FREE STATE AND NORTHERN CAPE INHERITED BLEEDING DISORDER REGISTRY**

Authors: MS Roux, MJ Coetzee, J Joubert

Department: Haematology and Cell Biology

Presenter: Mariska Roux

Introduction: Maintaining an updated registry on inherited bleeding disorders (IBD) is crucial for strategic planning and effective use of expensive treatment products. In South Africa, patients with bleeding disorders are treated at Haemophilia Treatment Centres (HTCs). Data on resource use and challenges facing haemophilia care in the Free State and Northern Cape HTCs are limited.

Aim: To update and expand the Free State and Northern Cape IBD Registry.

Methodology: All available clinic records at the Bloemfontein and Kimberley adult HTCs up to 30 June 2017 were reviewed. Results were analysed using descriptive statistics.

Results: Records were available for 81 patients: 57 (70%) had HA (severe: 61%, moderate: 18%, mild: 19%); 12 (15%) had HB (severe: 58%, moderate: 42%), 9 (11%) had Von Willebrand Disease (Type 1: 33%, type 2A: 11%, type 2B: 22%, type 2M: 33%), 2 (2%) had Bernard-Soulier Syndrome, and 1 had Factor XIII deficiency. Inhibitors were present in 25% and 11% of HA and HB patients respectively. No patient had received immune tolerance induction therapy. The most frequent bleeds were haemarthroses, at a median of 3 bleeds per patient per year (range 2-12) for HA, and 2 bleeds (range 1-3) for HB. Fourteen (34%) HA and four (36%) HB patients received low-dose prophylaxis. In active patients, mean annual factor consumption was higher in patients on prophylaxis than those treated on demand (104 000 IU vs 30 000 IU) but median bleeding rates were similar (4 vs 3 bleeds per year).

Conclusions: This is the first update of the adult Free State and Northern Cape IBD registry since 2009. As is the case elsewhere, inhibitor patients present a significant challenge, which may benefit from wider use of immune tolerance induction therapy. Although the impact of low-dose prophylaxis on bleeding rates appears limited, further studies are required to identify the contributing factors.

Keywords: Inherited bleeding disorders, Registries, haemohilia treatment centres

LR -21

Title: **DNA EXTRACTION: THE DEVIL IS IN THE DETAIL**

Authors: C Booysen, CD Viljoen
Department: GMO Unit
Presenter: Chantelle Booysen

Introduction and aim: Discerning consumers may want to avoid specific animal species in food due to health, lifestyle and religious reasons. Animal species detection using DNA-based analysis such as Real-time PCR, depends on the extraction of detectable DNA. However, extracting DNA from processed food can be difficult due to the presence of degraded DNA and chemical inhibitors. Although methods are available for the extraction of DNA from processed foods, the inherent extraction efficiency of these methods is currently unknown. The aim of this study was to determine the inherent extraction efficiency of 10 methods (intended for food matrices) with regard to DNA yield and Real-time PCR amplifiability.
Methodology: Naked calf thymus DNA (5 µg) was used as input material for 10 different extraction methods including modified CTAB and nine food extraction kits. The concentration of extracted DNA was determined using fluorometry and quantitative Real-time PCR. The quality and quantity of DNA was confirmed by gel electrophoresis.
Results: The efficiency of extracted DNA ranged from 0.00% to 43.16%, compared to the amplifiability that ranged from 0.01% to 44.91%. Six methods (FoodProof, GeneSpin, NucleoSpin, FavorPrep, modified CTAB and Dneasy) were statistically the most efficient in terms of yield (8.57% to 43.16%) and Real-time PCR amplifiability (20.97% to 44.91%) whereas the remaining four methods (First Magnetic, SureFood, Gelatin and Wizard Magnetic) had low extraction efficiencies of 0.00% to 0.58% (DNA yield) and 0.01 to 4.23% (Real-time PCR amplifiability).
Conclusion: There are significant differences in the capability of the methods tested in this study to extract naked DNA. Thus, these methods may not extract sufficient amounts of DNA from processed food for animal species identification. However, the DNA extraction efficiency of these methods may differ when extracting DNA from different food matrices compared to naked DNA.

Keywords: DNA extraction, Processed food, Animal species detection

LR -22

Title: **DNA QUANTIFICATION: THE GOOD AND THE BAD**

Authors: CD Viljoen, C Booysen
Department: GMO Unit
Presenter: Chris Viljoen

Introduction and aim: Following DNA extraction, determining the concentration of DNA is usually an important step since molecular diagnostic applications require a minimum quantity of DNA in order to perform optimally. The most commonly used method to determine the concentration and purity of DNA is UV spectrophotometry at 260 nm. Fluorescent methods are considered more sensitive than spectrophotometry but require the use of fluorescent dyes. The aim of this study was to compare spectrophotometry and fluorescence to determine DNA concentration using 10 different DNA extraction methods.
Methodology: DNA was extracted with 10 different DNA extraction methods using naked calf thymus DNA (5 µg) as input DNA. Each extraction included an environmental control containing no DNA. The concentration of extracted DNA was determined using UV absorbance (BioDrop µLITE) and fluorescence (Qubit) and then compared to quantitative Real-time PCR.
Results: The linear correlation of DNA concentration to quantitative Real-time PCR was higher for the BioDrop (0.81) compared to the Qubit (0.49). However, up to 10 ng/µl, the linear correlation for the BioDrop (0.41) was lower than that of the Qubit (0.70). The environmental controls (no DNA) for the different extraction methods had a measured concentration of DNA ranging from 1.3 to 8.7 ng/µl using the BioDrop compared to undetected by the Qubit.
Conclusion: For extracted DNA, the BioDrop incorrectly estimated the concentration of DNA by an average of 152% above the LOD (1 ng/µl), compared to an average of 44% by the Qubit, that was more accurate across all concentrations. Furthermore, UV absorbance was affected by the method of DNA extraction resulting in erroneous detection of DNA in environmental controls (no DNA). Finally, determining the purity of DNA using spectrophotometry does not appear to have any practical benefit since there was no linear correlation between DNA purity and Real-time PCR amplification.

Keywords:

LR -23

Title: **IMMUNOGENICITY OF SINDBIS BASED REPLICONS FOR CRIMEAN-CONGO HEMORRHAGIC FEVER VIRUS**

Authors: T Tipih, FJ Burt
Department: Virology
Presenter: Thomas Tipih

Introduction and Aim:Crimean-Congo hemorrhagic fever virus (CCHFV) infrequently causes a hemorrhagic fever in humans with a case fatality rate of 30%. Currently there is neither an internationally approved antiviral drug nor vaccine against the virus.
The aim of the study was to investigate mechanisms of immunogenicity of Sindbis replicons encoding CCHFV glycoproteins and nucleoproteins for future development of an efficacious vaccine.
Methodology: Genes encoding the complete open reading frames of the CCHFV nucleoprotein and glycoprotein precursor proteins were amplified by the Reverse transcription polymerase chain reaction technique and cloned into a Sindbis virus replicon vector. Sanger sequencing was carried out to confirm gene sequences. Nucleoprotein and glycoprotein expression was demonstrated by transfecting baby hamster kidney cells. Groups of three NIH mice were immunised with 100µg of vaccine constructs three times intramuscularly. Two weeks after receiving the third dose mice were sacrificed; blood was collected for determination of humoral immune responses while harvested splenocytes were stimulated with a CCHFV antigen for cytokine responses.
Results: Two vaccine constructs expressing CCHFV glycoprotein (pSinCCHF-52M) and nucleoprotein (pSinCCHF-52S) were prepared. Protein expression was confirmed by immunofluorescence assays using serum from CCHF survivors. All immunised mice had detectable CCHFV IgG specific antibodies and higher levels of IgG2a in comparison to IgG1 responses were observed with the constructs. Vaccine construct pSinCCHF-52S resulted in superior interleukin (IL)-2, interferon gamma and tumour necrosis factor alpha responses which are associated with Th1-type cellular immune response.
Conclusion: The study demonstrated expression of CCHFV nucleoprotein and glycoprotein by a Sindbis virus vector. Vaccination of mice with constructs elicited high titers of CCHFV IgG antibodies and a predominantly Th1-type cellular immune response. Further studies in CCHFV susceptible animals are necessary to determine whether the immune responses are protective. However, this study shows the utility of Sindbis replicons in vaccine development against CCHFV.

Keywords: CCHFV, Sindbis Replicons encoding CCHFV glycoproteins, Vaccine constructs

LR -24

Title: **MOLECULAR CHARACTERISATION AND PREVALENCE OF TUBERCULOSIS IN ADOLESCENTS IN THE FREE STATE, JANUARY 2016 – JUNE 2017.**

Authors: C Butcher, M Mahloane, J Musoke, Y Coovadia, A Van der Spoel van Dijk
Departments: Universitas Academic Laboratory, NHLS, Medical Microbiology,
Presenter: MasingoanengMahloane

Background: The World Health Organisation does not report specifically on the prevalence of tuberculosis (TB) and multi-drug resistant TB (MDR-TB) amongst adolescents (aged 10-19 years). However, hormonal influences and social behavior may possibly increase the risk of TB infection and transmission in this age group. Furthermore, reports indicate increased virulence associated with the Beijing type TB strains. Therefore the aim of this study was to document the prevalence, strains, and associated drug resistance in MTB isolates in the Free State, South Africa.
Methodology: Data from January 2016 to June 2017 was used to determine the prevalence of TB and MDR-TB in adolescents while strain variation was determined using spoligotyping.
Results: Of the 627 adolescents with TB, 54% were females. Overall, the number of TB and MDR-TB cases increased with increasing age. In adolescents 10-14 years, susceptible versus resistant cases of TB per 100 000 population was 13 and four respectively, whereas, in the age group 15-19, it was 8 and 10 respectively. The correlation of susceptible versus resistant cases with age was not found to be significant (p-value = 0.24387), whereas the correlation between resistant TB and age was highly significant (p-value= 0.001193). Fifty-one strains were spoligotyped. Beijing was the most prevalent (31.37%), followed by Latin-American-Mediterranean (LAM; 25.49%) and the T family (15.69%). The X and S family accounted for 9.8% and 5.88% strains respectively. LAM3 was the largest clone amongst the LAM family (21.57%), whereas T1 (11.76%) and X3 (5.88%) were the commonest amongst the T and X subfamilies respectively.
Conclusions: Our findings suggest that there is significant transmission of Beijing strains amongst adolescents. In contrast, the high diversity amongst MDR-TB and susceptible strains, suggest that there is no association with either a specific lineage nor higher rates of transmission.

Keywords: TB in Adolescents, Beijing strains, Molecular epidemiology of MTB

LR -25

Title: **WHOLE GENOME SEQUENCING A TOOL TO ASSIST IN THE MANAGEMENT OF COMPLICATED TB CASES**

Authors: A van der Spoel van Dijk, UM Hallbauer, M Nyaga, K Baba, J Musoke, Y Coovadia
Departments: Universitas Academic Laboratory, National Health Laboratory Service
Presenter: Anneke van der Spoel van Dijk

Introduction: Whole genome sequencing (WGS) provides a complete genome analysis of tuberculosis (TB), but the data analysis is time-consuming. Patients with multi-drug-resistant (MDR) TB are followed-up monthly with microscopy, culture and drug susceptibility testing of sputum specimens and occasionally discordant results are obtained between the initial and subsequent specimens. This poses a major challenge for clinicians responsible for the management of these patients. WGS provides rapid and comprehensive analysis and has the potential to provide solutions in such cases. The study aimed to resolve discordant TB results with WGS and KvarQ analysis rapidly.
Methodology: DNA was isolated from TB cultures and WGS performed using an Illumina MiSeq platform (UFS). Query reads for WGS were processed with KvarQ bioinformatics using pre-compiled "testsuites" of SNPs to identify spoligotypes and short sequences for DR mutations without prior data assemble. We tested isolates (initial and follow-up sample) from a child (case 1) on treatment for MDR-TB, and from the grandmother (maternal index case). A follow-up sample from the child was drug susceptible (GenoType MTBDRplus). Samples from another child (case 2) with MDR-TB responded well to treatment with negative sputum results for five months. However, the follow-up sample at six months was culture positive, presenting a challenge for further treatment. The original and follow-up cultures were sequenced.
Results: WGS results found concordance of DR mutations and Latin America-Mediterranean (LAM) lineage from the grandmother (case 1) and the first sample from the child. The second sample from the child indicated a susceptible Beijing type strain. Similarly, in case 2 the follow-up sample indicated Beijing lineage compared to an initial LAM, and different mutations consistent with an extremely resistant strain. Re-infection was therefore identified in both cases.
Conclusion: WGS and analysis with pre-compiled "testsuites" for KvarQ software can be used to resolve challenging cases of TB rapidly.

Keywords: TB Management, WGS, MDR-TB

LR -26

Title: **GENOMIC INVESTIGATION OF THE FAECAL RNA VIROME IN CHILDREN FROM OUKASIE CLINIC, NORTH WEST PROVINCE, SOUTH AFRICA**

Authors: MT Mogotsi, PN Mwangi, LB Mosime, SP Rasebotsa, PA Bester, HG O'Neill, MM Nyaga
Departments: Next Generation Sequencing Unit, Medical Virology
Presenter: Milton Mogotsi

Introduction and aim: Establishing a diverse gut microbiota after birth is essential in preventing illnesses later in life. However, little knowledge exists about the total viral populations (virome) present in the gut of infants during this developmental stage, with RNA viruses being generally overlooked. This study is aimed at characterizing the gut RNA virome in South African children under one-year-old.
Methodology: Faecal samples (n=12) were collected from four healthy infants at three time intervals (7, 13 and 25 weeks old) and enriched for viral particles. RNA extraction and RT-PCR was performed, followed by library construction using Nextera XT library preparation kit. Sequencing was done on Illumina MiSeq platform to generate 251bp paired-end reads. Using an in-house analysis pipeline, raw reads were assessed for quality using Prinseq and de novo assembled using Metaspades. Contigs were BLASTx searched against the NCBI database using DIAMOND. Viral sequences were extracted for further diversity analysis.
Results: Diverse human enteric viruses were detected in all samples. Rotaviruses (Reoviridae) were the most predominant, followed by viruses within the Picornaviridae family such as parechoviruses, echoviruses, coxsackieviruses, enteroviruses and polioviruses. Astroviruses (Astroviridae) and Norwalk viruses (Caliciviridae) were detected at low abundance. Additionally, few sequences matched to plant viruses (pepper mild mottle virus), which was likely introduced through diet.
Conclusions: This study proves that viral metagenomics can be very useful in characterization of the virome of humans, providing insight into viral community structure and diversity. It is evident that the infants' gut is colonized by distinct viral populations irrespective of their health state. However, a significant portion of the sequences showed no similarity to sequences in databases showing our limited knowledge of the total scope of viral diversity present on earth, especially the largely unexplored RNA virome. This approach can be applied to a wide range of living hosts and environmental samples.

Keywords: Enteric viruses, next generation sequencing, diversity

LR -27

Title: **OPTIMIZATION OF IMAGE PROCESS PARAMETERS IN DIGITAL MAMMOGRAPHY USING THE TAGUCHI METHOD**

Authors: M Morphis, S Acho
Department: Medical Physics
Presenter: Michaella Morphis

Introduction: In the field of mammography, determining the optimum exposure parameters will always be a compromise between image quality and dose. Taguchi experiment can be performed, with the goal of maximizing one or more of the process specifications (image quality), while keeping others within limits (dose). The aim of the study was to find the optimum exposure parameters for various breast thicknesses, using Taguchi experiments.
Materials and Methods: Images of the CDMAM test object (mimicking breast thicknesses of 4.5cm, 5.5cm and 7.5cm) were acquired using combinations of exposure parameters (kVp, mAs, exposure compensation factor, filter material and field size) in level combinations as described by the Taguchi method, using the automatic exposure control (AEC) auto-filter mode, AEC auto-time mode and manual exposure mode. The images were assessed and scored based on image quality.
Results and Discussion: Adjusting the exposure parameters for AEC auto-filter mode to those obtained with the manual exposure mode (27 kV, 150 mAs, Ag, 24×29 cm^2), for breast thickness 4.5 cm, resulted in a 5.41% decrease in dose and a 15.21% increase in image quality. The exposure parameters for breast thickness 5.5 cm, using the AEC auto-time mode (29 kV, Ag, exposure compensation factor of 1, 24×29 cm^2), resulted in a 20.58% decrease in dose and a 17.62% increase in image quality, compared to the AEC auto-filter mode. The exposure parameters for the AEC auto-time mode for breast thickness 7.5 cm resulted in a decrease in dose of 27.59% and a decrease in image quality of 31.92%. The optimum exposure parameters for breast thickness 7.5 cm remain those used in the AEC auto-filter mode.
Conclusion: Optimizing exposure parameters in digital mammography can successfully be performed using Taguchi experiments. Taguchi experiments provide a simple, systematic and efficient methodology for optimizing exposure parameters, with a limited number of experiments.

Keywords: Taguchi, Mammography, CDMAM

LABORATORY POSTERS

LP-1

Title: **CANNABIS SATIVA L. AERIAL PLANT PARTS EXTRACTS REVERSE DRUG RESISTANCE IN LS513 MDR COLON CANCER CELLS IN VITRO**

Authors: I Mangoato, CP Mahadevappa, MG Matsabisa
Department: Pharmacology
Presenter: Innocensia Mangoato

Introduction: Multidrug resistance (MDR) to chemotherapeutic agents is on the increase with the current drugs being old and no new safe and effective drugs being developed fast enough. Anticancer properties of *C. sativa L*. have been extensively studied against various cancer cell lines but research on its effectiveness on their role in reversing MDR in cancer is less documented.
Aim: To determine the potential doxorubicin anticancer resistance reversal effects by *C. sativa L*. extracts in an in vitro test system.
Methodology: The cytotoxic effect of the *C. sativa L.* extracts was assessed against a panel of human colon cancer cells, namely HT-29, Caco-2, HCT-15, LS513 and normal colon (CCD-18Co). Drug-extract combination studies were performed on HCT-15 and LS513 MDR cells through a mixture of doxorubicin with a fixed sub-efficacious concentration of *C. sativa L*. extracts and verapamil (positive control).
Results: DCM: methanol-, methanol- and H2O extracts potently inhibited Caco-2, HT-29, HCT-15 and LS513 cell growth with IC50 values ranging from 0.1-30µg/ml. Hexane- and DCM extracts potently inhibited Caco-2, HT-29 and LS513 cell growth. Combination of C. sativa L. extracts and doxorubicin resulted in synergistic growth inhibitory effects against HCT-15 and LS513 cells. Cannabis extracts reversed MDR in HCT-15 and LS513 cells through decreased IC50 values compared to verapamil. The effect of *C. sativa L*. extracts in reversing doxorubicin resistance in the HCT-15 and LS513 MDR cells improved the effectivity of doxorubicin by shifting the IC50 on the dose-response curve to the left by 4.59- and 300.7-fold, respectively, compared to verapamil which improved it by 1.41-fold and 0.03-fold, respectively.
Conclusion: *C. sativa L*. extracts have shown their potential in the treatment of cancer through direct selective cytotoxic effect on colon cells and in combination with doxorubicin.

Keywords: Cannabis, colon cancer, Multidrug resistance in cancer cells

LP -2

Title: **MUTATION DETECTION IN THE ENDOGLIN GENE IN A FAMILY WITH HEREDITARY HAEMORRHAGIC TELANGIECTASIA (HHT)**

Authors: KT Peta, MJ Coetzee, G Marx
Departments: Genetics, Natural and Agricultural Sciences; Haematology and Cell Biology
Presenter: Marius Coetzee

Introduction and aim: Hereditary haemorrhagic telangiectasia (HHT) is a rare autosomal dominant bleeding disorder. It manifests as mucocutaneous telangiectases, visceral arteriovenous malformations and epistaxis. The phenotype is diagnosed using the Cura® criteria. HHT has been linked to the endoglin, activin kinase 1 (ALK1) and SMAD4 genes in numerous studies. Most studies are centred on European and American population groups. There are few publications of HHT on people of African descent, none of which are family-based studies. To our knowledge, this is the first study presenting mRNA expression sequence data of the endoglin (ENG) gene in a population of African descent. The aim of the study is to detect splice site and exon region mutations present in the ENG gene of the family members affected by HHT.
Methodology: RNA was isolated from blood, using the Ribopure blood kit after stabilisation in RNAlater. The RNA was converted to cDNA that served as a template molecule for sequence mutation detection. In total 11 primer pairs were designed and used to amplify 15 exon regions of the endoglin gene. Sanger sequencing was employed to determine ENG mutations.
Results: Four mutations were identified, two in exon 1 and two missense mutations in exons 5 and 11. The missense mutations were previously described in participants with and without HHT in literature, resulting in conflicting interpretations regarding HHT causality. No splice site variant were found in the study.
Conclusion: The identified mutations were present in individuals who were formerly diagnosed with HHT but none of them can be proved to be pathogenic since they were not present in all the affected family members. Future studies should focus on the mutation detection of other HHT associated genes like SMAD4, ALK1, BMP9 and RASA1 genes to decipher HHT pathogenesis in this family of African descent.

Keywords: Hereditary haemorrhagic telangiectasia, Endoglin, Vascular diseases

EDUCATIONAL PAPERS

ER -1

Title: **EMPLOYER-GENERATED COMPLAINTS TO THE STATUTORY REGISTRATION AUTHORITY - A BRIEF REVIEW OF THE REGULATORY FRAMEWORK FOR THE SUPERVISION OF EMPLOYED HEALTH PROFESSIONALS IN THE SOUTH AFRICAN PUBLIC SECTOR**

Authors: DT Hagemeister
Departments: Family Medicine
Presenter: Dirk Hagemeister

Purpose and background: Health professionals are often oblivious to the legal and regulatory framework that governs their employment situation. This paper aims to illustrate the different legal frameworks relevant for the employer-employee relationship regarding the healthcare workers' conduct.
Methods: Based on two case vignettes where the health profession-specific legislation has been used by the employer against the employed health professional, rather than the legislation regulating the employer-employee relationship, it will be illustrated how the three acts relevant to this relationship and their respective regulations are structured. This will be followed by a discussion of the potential impact of such 'employer-generated cases' (EGCs) on the employer-employee relationship and on the system at large.
Results: At least three legal frameworks are of relevance for the employer-employee relationship in the South African public health care sector, namely the Labour Relations Act (LRA), the Public Service Act and the profession-specific acts such as the Health Professions Act, the Nursing Act or the Pharmacy Act. EGCs deny the employed healthcare professional the procedural fairness provided for by the LRA and substitute instead proceedings of an often less than effective statutory registration authority. With resultant fear regarding professional future and the lack of corrective spirit, EGCs damage the employee's motivation and the employer-employee relationship.
Conclusions: Given the potentially devastating effect of EGCs for the health services, the reporting of employed healthcare workers by the employer should be governed by sound processes as to balance the protection of patients' and employer's interests with those of the professional.

Keywords:

ER -2

Title: **NOMINAL-GROUP-TECHNIQUE REVIEW OF THE EMERGENCY CARE CONTENT OF THE 3RD YEAR CLINICAL SKILLS MODULE (MCLI3713) IN THE UNDERGRADUATE MEDICAL PROGRAMME AT THE UNIVERSITY OF THE FREE STATE**

Authors: DT Hagemeister,
Departments: Family Medicine, Health Science Education
Presenter: Dirk Hagemeister

Introduction and aim: Managing medical emergencies is essential for medical practitioners. Medical students at the University of the Free State have a three-month emergency care block during the Clinical Skills Module, consisting of 4 hours of lectures or practical sessions per week for twelve weeks. Nominal-group technique (NGT) has been developed as a tool for program development, and has repeatedly been used for the assessment and improvement of educational programs.
Methodology: A two staged NGT was used to first identify strengths and weaknesses of the program from the 'clients' (students) and then for the 'experts'(academic clinicians and educators) to suggest possible improvements. Two nominal-group sessions were conducted with students that had either recently (3rd year students) or two years ago (5th year students) been exposed to the emergency care content of the module. The students were asked to identify positive aspects and matters that could be improved. Based on the results from these NGTs, two further NGTs were conducted with groups of 'experts' from the School of Medicine, asking firstly for suggestions for improvement with the current resources and secondly for additional resources deemed necessary.
Results: Ten and eighteen students participated in the student NGTs respectively, and seven and eight experts in the second-round. Students valued the practical skills obtained and some of the format of the teaching, but requested the increase of practical content as well as additional tools and modes of teaching such as videos and mock exams. Lecturers suggested to clearly spell out and coordinate outcomes, to clarify basic concepts and to use additional media, but emphasised the need for sufficient human resources, teaching tools and functional clinical equipment.
Conclusions: NGT provides a valuable tool to obtain critical suggestions from students and lecturers for improvement of clinical teaching of emergency care.

Keywords:

ER -3

Title: **USING EDUCATIONAL DESIGN RESEARCH TO DESIGN A CURRICULUM FOR A PROFESSIONAL OCCUPATIONAL THERAPY MASTER'S DEGREE IN THE FIELD OF SENSORY INTEGRATION**

Authors: A van Jaarsveld, N Scheepers, S van Vuuren, J Raubenheimer
Departments: Occupational Therapy, School of Higher Education Studies, Biostatistics
Presenter: Annamarie van Jaarsveld

Background: Currently no master's level qualification is available in South Africa for occupational therapists wanting to specialise in Ayres Sensory Integration (ASI®) and no international training currently provide for attainment of competencies in ASI®, relevant for third world settings. This research addressed the question of what would be an international acknowledged curriculum for postgraduate training in sensory integration, relevant for a developing country.
Methodology and Results: An educational design research (EDR) approach allowed for the use of sequential mixed methods. EDR not only framed the scientific enquiry, it also required the design of an intervention (a curriculum) and creation of design knowledge for future use. The research process consisted of an analysis and exploration- and a design and construction phase. The two phases included four micro-cycles of research activities with each micro-cycle leading to an evolved prototype of the curriculum. Multiple data generation and collection activities were used and included national and international experts in the field of ASI®, clinicians working in diverse settings, as well as curriculum experts. Prototype four of the curriculum served as the final intended curriculum. Amongst others, core competencies needed were determined, the importance of the South African context and its realities concerning service delivery identified and calculated in the design process. Qualification outcomes, modules and themes were established and module outcomes inclusive of teaching and learning activities with relevant assessment activities described. Knowledge was created in the form of theoretical understandings serving as 'foundational' theory, which can be expanded in future educational design research in this field.
Conclusion: Through use of EDR it was possible to obtain real world knowledge and opinions of various stakeholders on what would be the best curriculum for a professional master degree level for occupational therapists, wanting to deliver ASI® services in a third world context.

Keywords: Curriculum design, sensory integration, occupational therapy

ER -4

Title: **MULTIPLE TRANSITIONS OF UNDERGRADUATE FIRST-YEAR STUDENTS IN THE MBCHB PROGRAMME: EXPECTATIONS, EXPERIENCES AND EMOTIONS**

Authors: N Tlalajoe, MP Jama
Departments: Student Learning and Development
Presenter: Nokuthula Tlalajoe

Introduction and aim. The transition from school to tertiary study can be daunting and overwhelming. Many students who have potential are underprepared for this transition. However, institutions are equally as underprepared. Studies on transition into medical programmes have only focused on the "state of being a first-year medical student" rather than the "transition process" itself. The focus of this paper will not only be on the transition process, however, on the multiple transition phases within the first year of the MBChB programme at the University of the Free State (UFS). The aim was to determine the first-year undergraduate medical students 'perception of their multiple transitions within the first year.
Methodology. Two focused group discussions were held in 2017 with 19 first-year undergraduate medical students who went through multiple transitions within their first year of the MBChB programme. Three transitional phases were investigated; (i) the beginning of the first year (phase 1), (ii) six months later (phase 2), (iii) back into the beginning of the first year for the second time (phase 3). The focus during the discussions was on their perceptions of the multiple transition phases. Three main themes were identified namely the expectations and experiences, emotions and recommendations during analysis of data.
Results. According to the results, most students stated that during the initial transition, lecturers and senior students did not provide them with a "big picture" regarding expectations in the MBChB programme. Instead, expectations shared did not match their "real" experiences in the programme. Eventually, they experience different forms of emotions. The main recommendation from the students was the importance of social integration and relationships in the faculty and with lecturers.
Conclusion. Medical schools such as the UFS should consider the multiple transitions that students go through within their first year, and design strategies that will ease these transitions.

Keywords: Experiences, first–year medical students, transition

ER -5

Title: **THE ETHICAL ASPECTS OF PEER PHYSICAL EXAMINATION (PPE)**

Authors: MGM Hattingh

Departments: Simulation and skills unit

Presenter: Maryna Hattingh

Background: Peer physical examination (PPE) is used globally to facilitate clinical physical examination training. Due to the diverse student population consideration must be given to the application of PPE in ethical aspects such as beneficence, non-maleficence, autonomy and justice or fairness as describe by Beauchamp and Childress.

Method: A qualitative research design was followed with three focus group interviews with students and lecturers from the Faculty of Health Sciences. Transcription of focus groups was done, themes, categories and subcategories identified, compared and discussed with the findings and recommendations of the literature review in mind.

Results and Discussion: Most participants agreed that the use of PPE is beneficial to students. Participation in PPE provided a safe environment to improve the competence and confidence of students without fear of embarrassment. Non-maleficence is demonstrated by the safe environment where students can practise under supervision until they feel competent. Autonomy is confirmed by the choice students have whether to participate in PPE and the value different students put on the amount of body exposure they allow. Justice or fairness is verified by the fact that informed consent must be obtained from all participants who need adequate time to read through the documents before agreeing to participate. Professional attributes such as respect for others, communication skills and building a trust relationship with patients are enhanced by PPE.

Conclusion: The use of PPE supports the ethical principles of Beauchamp and Childress. Students learn the importance of moral values and ethical behaviour.

Take home message

Participation in PPE teaches students the ethical principles and professional attributes they will apply throughout their careers.

Keywords: Beneficence, Non-Maleficence, Justice Or Fairness

ER -6

Title: **INSTITUTIONAL CAPACITY DEVELOPMENT IN THE START-UP OF A LARGE COHORT CARDIOVASCULAR / HIV STUDY. A SWOT ANALYSIS.**

Authors: CL Barrett, WF Mollentze, AM van Staden, TRP Mofokeng, D Steyn, GM Marx, R Nhiwatiwa, KG Tsie, WJ Janse van Rensburg, J Dave

Departments: Internal Medicine (UFS), Department of Genetics (UFS), Farmovs (UFS), GMO Unit, Department of Haematology and Cell Biology (UFS), Internal Medicine (UCT)

Presenter: Claire Barrett

Introduction: A grant was awarded by the Free State Department of Health to the Department of Internal Medicine to perform a large HIV/cardiovascular risk study. “The incidence of modifiable cardiovascular risk factors in HIV-infected subjects initiated on antiretroviral treatment in the Free State: A cohort study”, is a large study and regular internal review processes are necessary to ensure good scientific governance.

Methodology: A SWOT (strengths, weaknesses, opportunities, threats) analysis was undertaken to identify internal strengths and weaknesses as well as external opportunities and threats after enrolment of the first 50 participants. A focus group of nine of the twelve investigators performed the SWOT analysis.

Results: Intra- and inter-institutional collaboration was identified as a strength and opportunity. Other strengths include commitment, multi-disciplinary team-work, a robust protocol and three linked PhD projects. There is opportunity to develop checklists to ensure stricter protocol compliance. Completeness of and access to baseline laboratory results drawn at the referral clinic resulted in delay in initiation of antiretroviral therapy, which is a weakness, threat and also an opportunity to train referral clinic staff. Referral site training has to be repeated frequently due to high staff turn-over. Other weaknesses are long visit time for subjects, the use of an off-site laboratory (which caused sample processing delays and some sample misplacement), study staff turnover (retirement, changed employment status, poor remuneration, better opportunities), as well as a complicated / constrained financial administration system of the host institution. Clinical and academic work-load, poor subject recruitment and long distance travel for some investigators threaten the sustainability of the project.

Conclusions: Grant funding to conduct this study has provided our institution with an opportunity to develop research experience, although not without challenges. Strengths and opportunities identified help to overcome weaknesses and threats encountered. Internal review processes are critical for scientific governance.

Keywords: Scientific governance, SWOT analysis, HIV/Cardiovascular risk

ER -7

Title: **A CRITICAL ANALYSIS OF THE MULTIPLE-CHOICE QUESTION BANK FOR UNDERGRADUATE MEDICAL STUDENTS IN ANAESTHESIOLOGY AT THE UNIVERSITY OF THE FREE STATE**

Authors: LM Pheiffer, CL Odendaal, FHS Schoeman
Department: Anaesthesiology
Presenter: Marius Pheiffer

Introduction and aim: Assessment is a critical component of medical education. Developing high-quality MCQs as part of assessment is a complex and tedious process. A well-set examination reflects positively on a curriculum, which has been taught and demonstrates to the students that the faculty values all aspects of the course. This is in keeping with an assessment for learning approach compared to an assessment of learning approach.

Methods: Data were collected from the questions that formed part of the MCQ bank by June 2016. MCQ Items were categorised into the specific MCQ subgroups i.e. multiple true/false(T/F), single best answer(SBA), SBA with T/F characteristics or matching. Thereafter, items were categorised according to the cognitive domain of the item content, i.e. whether the item tested either simple recall of knowledge or application of knowledge. Finally, the items of the SBA type were rated for item-writing flaws and classified as either standard or flawed.
Results: Study results revealed that of the 1 999 MCQs evaluated, 34% were of the multiple T/F category, 7.6% were of the SBA category, 24.7% were of the SBA with true/false characteristics, and 33.7% were of the matching category. Furthermore, of the 1 999 items evaluated, 97.2% tested recall of knowledge, and 2.8% tested application of knowledge. Lastly, of the 152 SBA-type questions, 80.9% were evaluated as flawed, and 19.1% were evaluated as standard.
Conclusion: The overall quality of the bank was found to be of a sub-optimal standard. The frequency/percentage of items in the MCQ bank that meet requirements for the SBA type is low, and of those SBAs, the presence of item-writing flaws are high. Another important conclusion that can be drawn from this study is that most of the MCQs require the examinee to recall isolated facts, i.e. low cognitive level.

Keywords: Assessment, Multiple-choice questions, anasthesiology

ER -8

Title: **THE PSYCHOLOGICAL IMPACT OF PROVIDING THE FETICIDE PROCEDURE: HEALTH SERVICE PROVIDERS' EXPERIENCES.**

Authors: AC Vorster, C Macleod
Departments: Undergraduate Programme Management, Rhodes University Critical Studies in Sexualities and Reproduction (Research Unit)
Presenter: Angela Vorster

Introduction/ aim: Within the South African context, 'feticide' and late termination of pregnancy are offered to certain women carrying a foetus diagnosed as having a congenital abnormality or condition that is 'incompatible with life'. 'Feticide' is regarded internationally as an essential step in ensuring a stillbirth rather than a 'wrongfully alive' baby once the pregnancy has progressed past the point of foetal viability. These are common medical procedures that take place more frequently within the public than private healthcare systems in South Africa. This research aims to explore and describe health service providers'; experiences of these procedures as interpreted through a feminist health psychology lens.
Methodology: 10 participants were interviewed and these interviews were coded and analysed using the social constructionist grounded theory methodology developed by Cathy Charmaz. Theory-building follows qualitative analysis of the content.
Results: A significant number of medical personnel leaving the public health sector increases pressure on the remaining personnel. Consequently there are fewer health service providers willing to assist with or perform the feticide procedure and there is increased pressure to perform these procedures even with limited training. Conscientious objection further reduces the number of eligible medical personnel involved with patient care. Availability of a complete multi-disciplinary team greatly reduces the weight of decision-making on individual personnel and stigma associated with the procedure. Medical personnel place service delivery above their personal health, to their detriment.
Conclusion: Immense need for psychological support for health care providers involved with these procedures. In order to address psychological trauma and burnout it is vital for staff deficits to be addressed and physicians to be assisted in acquiring specialised skills required to perform these procedures. Psychoeducation is required amongst all obstetrics/gynaecology staff to reduce stigma and prejudice with regard to late termination of pregnancy due to foetal abnormality.

Keywords: Feticide, Psychology, Health providers

ER -9

Title: **PRESENCE OF HEALTH DIALOGUE ELEMENTS DURING COMMUNICATION BETWEEN PATIENTS AND NURSES**

Authors: LJ Talbot, M Reid, M Nel

Departments: School of Nursing, Biostatistics

Presenter: Lesley Talbot

Introduction and aim: Nurse and patient communication aims to improve health outcomes. Such shared communication is characterised by health dialogue sanctioning mutual participation of both parties. The extent to which health dialogue is currently incorporated into individual nurse-patient communication is unknown. A conceptual analysis of "health dialogue" laid the foundation for the assessment of the presence of health dialogue elements during health communication between nurses and patients.

Methodology: A quantitative, non-experimental, descriptive, cross-sectional research design was used. A structured observational checklist, aided by a guideline, was used to observe and question nurses (n=22) and patients with diabetes (n=88) in public and private health facilities (n=16). Each nurse was observed interacting with more than one patient. Descriptive statistics, namely, frequencies and percentages for categorical data and medians, were calculated per group, comparing the nurse and patient responses per health dialogue element.

Results: Nurses and patients were unable to consistently demonstrate the elements positive attitude (64.2%) and sensitivity and respect during interaction (33.3%). In the training element nurses displayed inadequate training in diabetes (19.3%) and in communication skills (30.6%). Patients received more diabetes training (48. 7%) than nurses, but communication skills training (3.4%) was low. In spite of the inconsistent presence of some health dialogue elements, nurses and patients sensed the presence of shared responsibility/decision-making (67%, 68.2%), a health plan of mutual benefit (79.5%, 81.6%) and the use of context-sensitive communication strategies (73.6%, 67.8%).

Conclusion: Nurses and patients appear to be unprepared to incorporate health dialogue elements during interaction. Capacity building is recommended for both patients and nurses.

Keywords: Health dialogue, patients, nurses

ER -10

Title: **THE USEFULLNESS OF THE MOVEMENT ABC-2 CHECKLIST AND DEVELOPMENTAL COORDINATION DISORDER QUESTIONNAIRE'07 FOR PARENTS' AS SCREENING TOOLS TO IDENTIFY DEVELOPMENTAL COORDINATION DISORDER IN GRADE 1 LEARNERS**

Authors: M de Milander, AM du Plessis, FF Coetzee

Department: Exercise and Sport Sciences

Presenter: Monique de Milander

Introduction: Developmental coordination disorder (DCD) is a neuro-motor developmental disorder that interferes with a child's ability to perform daily tasks.

Aim: The Aim of the study was to examine the convergent validity of motor difficulties by a therapist using the MABC-2 Performance Test and the identifying of motor difficulties by parents when completing the (i) MABC-2- Checklist and (ii) DCDQ'07. This was done to determine if parents possess the competency to identify grade 1 learners with DCD and to determine which screening tool yields the best results.

Methodology: Two hundred and eighty one (N = 281) grade 1 learners in Bloemfontein, South Africa, between the ages of five and eight years took part. There were 160 girls and 121 boys. The ethnic groups consisted of 176 Caucasian and 105 Black learners.

Results: The MABC-2- Checklist for parents a kappa coefficient of 0.159, and thus had a small effect size (r = 0.15). There was only a 16% convergent validity. The DCDQ'07 for parents indicated a kappa coefficient of 0.175, also a small effect size (r = 0.18). There was only a 17.5% convergent validity.

Conclusion: It can be argued that parents using the DCDQ'07 and the MABC-2- Checklist could not identify learners with DCD.

Keywords: Developmental Coordination Disorder, Children, Movement Assessment Battery for Children – 2 Checklist

ER -11

Title: **IDENTIFICATION OF DEVELOPMENTAL COORDINATION DISORDER (DCD) IN GRADE 1 LEARNERS: A SCREENING TOOL FOR PARENTS AND TEACHERS**

Authors: M de Milander, AM du Plessis, FF Coetzee
Department: Exercise and Sport Sciences
Presenter: Monique de Milander

Introduction: Developmental Coordination Disorder (DCD) is a motor disorder of unclear etiology that severely affects a child's everyday motor abilities.
Aim: The study examined the convergent validity of the Movement Assessment Battery for Children-2, Checklist (MABC-C) completed by parents and teachers, with the Movement Assessment Battery for Children-2, Performance Test (MABC-2) completed by a therapist, to determine if parents and teachers were competent to identify learners with DCD.
Methodology: A total of 323 5–8-year-old Grade 1 learners (183 girls, 57.7%; 193 Caucasian, 59.8%; 130 Black, 40.2%) participated in the study.
Results: The MABC-C for parents demonstrated a specificity of 71.4%. The convergent validity between the two assessment tools when completed by the parents indicated a kappa coefficient of 0.143, with medium effect size (r = 0.240). The MABC-C for teachers demonstrated a specificity of 72.6%. The convergent validity between the two assessment tools when completed by the teachers indicated a kappa coefficient of 0.161, with a medium effect size (r = 0.228).
Conclusion: It is clear that parents and teachers using the MABC-C could not identify DCD in children.

Keywords: Developmental Coordination Disorder, Children, Movement Assessment Battery for Children -2 Checklist

ER -12

Title: **IMPLEMENTING OF A COMPETENCY-BASED MIDWIFERY PROGRAMME IN LESOTHO: A GAP ANALYSIS**

Authors: CN Nyoni, Y Botma
Department: School of Nursing
Presenter: Champion Nyoni

Introduction and aim: Global reforms in health professions education, including midwifery, support the transformation of professional education programmes to adopt competency-based models. Lesotho, a small sub-Saharan African country, with perennially high maternal and neonatal mortality, adopted a competency-based education model in the design and subsequent implementation of a one-year post-basic midwifery programme. Disparities in the implementation of the new programme were observed within two years of implementation. This study sought to describe the implementation of the competency-based midwifery (CBM) programme in Lesotho.
Methodology: This study was executed through a qualitative research design, appraising the performance of the CBM programme in five nursing education institutions in Lesotho against the International Confederation of Midwives (ICM) global standards for midwifery education and the described curriculum. Primary stakeholders from the five institutions were clustered into three groups namely, the administrators, facilitators and the students. Data were gathered from administrators and facilitators through semi-structured interviews while, focus groups were used to generate data from students. Programme documents used in the CBM programme in each institution were also reviewed. Data was analysed thematically through deductive reasoning.
Results: The findings revealed a vast gap between the ICM global standards for midwifery education, the described curriculum, and what was enacted in the nursing education institutions. The essential components of the midwifery programme had not been transformed to accommodate competency-based education.
Conclusion: We argue that structural and operational elements of a programme should be adjusted before and during the implementation of such a curriculum innovation to enhance a positive teaching and learning experience, further sustaining the programme. Contextually relevant frameworks should therefore be developed that are aimed at implementing and sustaining the entire programme.

Keywords: Competency-based education, Midwifery Programme, Implementation

ER -13

Title: **UNDERGRADUATE MEDICAL STUDENTS'; PERCEPTIONS OF RESILIENCE**

Authors: A Botha, LJ Van der Merwe
Departments: Psychology, Programme Director, School of Medicine
Presenter: Anja Botha

Introduction and aim: Burnout is common among medical students and has a negative impact on their academic performance, well-being, and the quality of care they provide for their patients. In addition, medical students' well-being seems to decrease as they progress with their studies. Resilience may serve as a buffer against stress, and enable these students to better meet the demands associated with medical studies. The aim of this paper is to explore undergraduate medical students' perceptions of the factors that play a role in their resilience.
Methodology: The participant group consisted of first to fifth year undergraduate medical students. They completed an open-ended question explaining their stated level of resilience as part of a larger survey. The data was analysed by means of thematic analysis.
Results: The findings indicate that for students who consider themselves resilient, factors such as intrinsic motivation, and family support contribute to their resilience. The most common theme was the importance of coping skills for developing resilience. For students who consider themselves not resilient, factors such as an inability to cope and self-doubt hampered their resilience. The most common theme in this group was that their pre-existing mental health challenges seem to hamper resilience.
Conclusion: These findings can guide medical schools towards early intervention: both to develop student's resilience, and offer support to at-risk students. By providing students with resilience enhancing resources, medical schools may improve student's academic performance, as well as the quality of patient care provided by future healthcare professionals.

Keywords: Resilience, medical students, education

ER -14

Title: **ARE UFS MEDICAL STUDENTS SUFFERING FROM BURNOUT?**

Authors: LJ Van der Merwe LJ, A Botha, G Joubert
Departments: Undergraduate medical programme management, Psychology, Biostatistics
Presenter: Lynette Van der Merwe

Introduction and aim: Medical students are at risk for burnout due to various demands placed on them. The aim of this study was to investigate burnout and associated factors among undergraduate medical students at the UFS.
Methodology: A cross-sectional study was done using an anonymous self-administered questionnaire. Data were collected on the Copenhagen Burnout Inventory (CBI), as well as demographic and other information related to resilience, and associations between burnout subscales and various factors were determined.
Results: Five-hundred students (n=270 pre-clinical, response rate 79.2%; n=230 clinical, response rate 62.0%) completed the questionnaire. CBI mean scores for pre-clinical and clinical students, respectively, were 17.9 and 17.4 (personal), 22.3 and 21.9 (work-related) and 24.8 (patient-related; clinical students only). High scores on the subscale reflect low levels of burnout in related areas. Male gender and students with high self-reported resilience and low stress had significantly lower burnout levels. White pre-clinical students had lower personal and work-related burnout and Black clinical students had lower patient-related burnout. Pre-clinical students who perceived a high level of holistic institutional staff support, and reported a collaborative learning environment, had significantly lower personal and work-related burnout, and satisfaction with the learning environment was associated with significantly lower personal and work-related burnout.
Conclusions: In this study, high mean scores in all three burnout subscales indicated low burnout levels among medical students. Students who reported academic and personal stress, and perceived poor support from institutional structures, also had significantly higher personal and work-related burnout. This was not the case for patient-related burnout in clinical students. Students reporting major life events or financial stress did not have higher burnout. Lower burnout was associated with a collaborative learning environment prioritising student academic development. Findings from this study emphasise that student wellbeing should be prioritised in the teaching and learning environment.

Keywords: Burnout, medical students, student wellbeing

ER -15

Title: **BREAKING NEW GROUND: ESTABLISHING AN ACADEMY FOR CONTINUING NURSING EDUCATION**

Authors: DE van Jaarsveldt, A Joubert
Departments: School of Nursing
Presenter: Deirdre van Jaarsveldt

Introduction and purpose: The transforming higher education and training system in South Africa included short learning programme (SLP) provisioning. The purposes of SLPs were to: enable access to higher education; support continuing professional development (CPD) and generate third stream income for the institutions. Concurrently, efforts were made to include nurse practitioners in the awarding of CPD points. Having established an academy for continuing nursing education in response to these directives, it was important to determine the effectiveness of this venture. Research was conducted in two phases to: i. Determine the extent to which the national purposes envisioned for SLPs were achieved, and ii. Explore and describe the key factors contributing towards the effective establishment of the academy.
Methodology: Phase one involved a single, evaluative case study and Phase two, which forms the focus of this presentation, employed a single explorative case study design. In-depth individual interviews were conducted with the management team of the academy. The benefits, challenges, lessons learnt in the process, as well as recommendations for the establishment an academy in other contexts were explored. A thematic content analysis of the data was conducted.
Findings: Both an educational and a business component were identified as two strong pillars and quality management emerged as an overarching theme throughout the process. Being flexible and including other healthcare professions, as well as the corporate sector, contributed greatly to the success of the academy.
Conclusion: Ultimately, social responsiveness ostensibly ensures a healthy balance by contributing to the vibrancy of the academy. It is legitimate to ask to what extent the identified key factors would apply to other contexts.

Keywords: Continuing professional development, nursing education, short learning programmes

EDUCATIONAL POSTERS

EP -1

Title: **STRATEGIES TO REDUCE STILLBIRTHS IN THE FEZILE DABI DISTRICT, SOUTH AFRICA**

Authors: SR Noge
Department: School of Nursing
Presenter: Sesi Noge

Introduction and aim: Fezile Dabi District is situated in the Free State and faced with challenges of reducing perinatal deaths. The PPIP tool has been rolled out in the Province to identify possible causes of perinatal deaths and develop preventative healthcare interventions to address identified causes. The aim was to explore beliefs and practices of women who gave birth to stillbirths, significant others and midwives in maternity units in order to develop healthcare strategies that aim to reduce stillbirths.
Methodology: The study design was qualitative and multiple methods were used. The study comprises of two phases, purposes were to understand stakeholders' perspectives regarding causes of stillbirths and to develop and validate healthcare preventative strategies. Atlas Ti. Computer Software analysed data which resulted into six themes and further reconstructed into a manageable format.
Findings: Three themes that emerged, namely, empowerment, social norms and flexible environment were used to analyse and compile report. Lack of empowerment and social norms, beliefs, and practices, such as traditional practices, traditional role players, and abuse by partners, traditional restrictions or prescriptions, contribute to poor attendance of clinics, including avoiding seeking medical assistance by pregnant women, causing stillbirths.
The EDM model and feminist perspective demonstrated that some pregnant women were oppressed and exploited by traditional norms and that empowerment may influence pregnant women's healthcare choices positively. Inflexible environment, included healthcare professional's incompetency, EMS transport and call centre challenges, inaccessible quality healthcare, poor communication and referral and caesarean sites policies. Negative personnel attitudes and inadequate operational hours, lead to pregnant mothers not attending healthcare facilities or seeking assistance when in labour, causing stillbirths.
Conclusion: This study's recommendations and the preventive healthcare strategies, will assist relevant stakeholders to reduce stillbirths. The impact of implementation of preventive strategies will be realised through collective approach and support from stakeholders.

Keywords: Stillbirths, Maternity units, Preventive strategy.

EP -2

Title: **PERSPECTIVES OF ACADEMIC STAFF ON THE ROLES OF THE NEWLY APPOINTED TEACHER IN HEALTH SCIENCES**

Authors: C van Wyk, MM Nel, GJ van Zyl
Departments: Division Health Sciences Education, Office of the Dean, FoHS
Presenter: Chantel van Wyk

Introduction and aim: The health sciences teachers wear many "hats" in the key roles we portray in the educational process. Staff development initiatives can assist the newly appointed teacher to gradually obtain the necessary competencies required for these various roles. The aim of this study was to identify which of the roles to focus on first during training and what additional support structures should be put in place to best support the newly appointed teacher.
Methods: An adaptation of the 12 roles of the medical teacher model framed by Harden and Crosby (2000) was used in this study. The research methodology was quantitative in nature, using a questionnaire to obtain data from 256 academic staff members from the Faculty of Health Sciences. Staff were asked to indicate (on a four-point scale) their perception of the level of importance of each role with specific reference to the newly appointed health sciences teacher. A 50.4% response rate was obtained.
Results: Academic staff considered the roles of a role model for students (99.2%), an information provider in the classroom (98.4%), facilitator of learning (97.6%) and assessor (97.6%) most important for the newly appointed teacher. The roles of curriculum planner and evaluator were deemed not important at all by 28.9% and 22.7% of academics. The academics strongly agreed that competencies in the various roles should be gradually obtained through continued support within departments and from the DHSE.
Conclusion: Several staff development initiatives, staggered over time should effectively demonstrate all the roles of the medical teacher. However, directed on-the-job training within departments as it pertains to the specific roles the newly appointed teacher will be involved in, is advised for further identification with the roles and continued skills development.

Keywords: Staff development, newly appointed academics, roles of the lecturer

EP -3

Title: **ASSESSMENT OR ASSASSINATION? PHARMACY STUDENTS' OPINIONS REGARDING THE CAUSES OF THEIR ASSESSMENT ANXIETY AND POOR ACADEMIC PERFORMANCE.**

Authors: CS Mostert, C van Wyk
Department: Health Sciences Education
Presenter: Chantel van Wyk

Introduction and Aim: Assessment is a means of judging evidence students provide regarding their achievement of the required competencies of a qualification (SAQA 2014:4). Assessment has multiple profound effects on learning and anxiety levels (Ziedner 1998:17, Dochy et al. in Boud & Falchikov 2007:90, Cilliers et al. 2012:45). Results were reported on questions, in a self-administered questionnaire, inquiring into modules in which pharmacy students experience the most assessment anxiety and the worst performance, as well as the reasons for their anxiety and poor academic performance in these modules.
Methodology: A quantitative study was conducted using a self-administered questionnaire. The target population included 170 final year North West University pharmacy students of whom 110 completed questionnaires which were utilised for statistical analysis.
Results: Pharmacy students reported that they experience the most assessment anxiety in Pharmacology (54%) and Pharmaceutics (30%) modules. Pharmacology (72%) and Pharmaceutics (19%) were also reported to be the modules in which pharmacy students performed the worst. The top three reasons for assessment anxiety experienced, were cited as follows: Workload (67%), communication constraints (36%) and content difficulty (33%). Reasons reported by a majority of pharmacy students for poor academic performance in modules, were workload (45%) and communication constraints (26%).
Conclusion: The same factors which cause assessment anxiety for final year pharmacy students also cause poor performance. This information may be useful in enhancing assessment practices and learning in the NWU School of Pharmacy.

Keywords: Assessment anxiety, assessment performance, pharmacy education, student perceptions

EP -4

Title: **CONTINUOUS PROFESSIONAL DEVELOPMENT ECHOCARDIOGRAPHY TRAINING IN SOUTH AFRICA**

Authors: M van Schalkwyk, Chantel van Wyk
Departments: Health Sciences Education
Presenter: Chantel van Wyk

Introduction and Aim: In South Africa, the requirements for continuous development (CPD) only specify CPD in general and not field-specific, although the HPCSA recognises and endorses CPD as a means of ensuring provision of best possible practice to the public. This lack of field specific CPD for echocardiography provided evidence for the need to investigate the possible prerequisites for CPD of echocardiography training in South Africa. The overall goal of the study was to determine what is needed to implement echocardiography-specific CPD, and how it can be implemented.
Methodology: A literature study was done to gain a deeper understanding of CPD with reference to health professionals and specifically echocardiography. A questionnaire was compiled, considering some barriers that were identified and which affect compliance with CPD regulations. The questionnaire was compiled electronically and printed in a hard copy using the Evasys system. The target population was echocardiographers who attended the annual New Horizons in Echocardiography congress during 2016, and echocardiography practitioners through reference from the attendees of the New Horizons in Echocardiography congress.
Results: The study revealed that improved communication and access to continuous professional development activities, with specific reference to practical hands-on activities, were the main needs of echocardiographers. It also revealed that formal accreditation and training need to be monitored more closely and that most echocardiographers did not feel up to date with the latest technology and procedures in the field. Although there were some limitations during this study, it was evident that CPD accreditors, and CPD service providers need to plan, organise and provide information in advance for echocardiography practitioners to plan and be able to attend the CPD activities.
Conclusion: Addressing the needs of echocardiography practitioners with regard to CPD will contribute positively not only towards the workplace and profession, but to the community at large.

Keywords: Echocardiography training, CPD regulations, Echocardiography-specific CPD

EP -5

Title: **MANUSCRIPTS FINALISED FOR JOURNAL SUBMISSION BY THE UNIVERSITY OF THE FREE STATE SCHOOL OF MEDICINE MEDICAL EDITOR: JOURNAL RESPONSE TYPES AND TIMES**

Authors: G Joubert, T Mulder, WJS Steinberg, J Botes
Departments: Biostatistics, Family Medicine
Presenter: Theanette Mulder

Introduction and aim: Thorough peer review of research manuscripts is a cornerstone of research publishing. From an author's perspective, manuscript submission and review processes, however, seem fraught with time delays and obstacles. The aim of this study was to describe journal response types and times for manuscripts finalised for journal submission by the University of the Free State School of Medicine (SoM) medical editor from 2014 to 2017.
Methods: This descriptive cohort study with an analytical component included all manuscripts finalised for journal submission by the SoM medical editor from 2014 to 2017. The medical editor's Excel spreadsheets capturing all the stages and activities of the manuscript process were used to confidentially note information related to the manuscript submission to a journal and subsequent communication with/from the journal.
Results: Ninety-five manuscripts were submitted. Since only 48% of manuscripts were accepted by the first journal submitted to, the total number of submissions was 163. Submissions were made to 72 different accredited journals. Rejected submissions (n=81) had a median journal response time of 14 days (range 0 to 381 days), with only 32% being sent for review. Only 1% of finally rejected submissions were rejected after the authors had submitted a revision. Nine manuscripts were accepted with no revisions needed, with a median journal response time of 88 days (range 0 to 182 days). The majority of manuscripts accepted (n=71) had one round of revision before acceptance. For successful submissions the median time from submission to final acceptance was 119 days (range 0 to 674 days).
Conclusion: Within this setting, the majority of first submissions were unsuccessful, but rejection of a manuscript usually occurs rapidly and only rarely after revisions were requested. Accepted manuscripts were accepted at a median time of 4 months, after one round of revision. However, extreme response times did occur.

Keywords: Journal response time, journal response type, journal submissions

EP -6

Title: **#FEESMUSTFALL2016: THE PERCEIVED AND MEASURED EFFECT ON CLINICAL MEDICAL STUDENTS**

Authors: H Brits, G Joubert, L Lomberg, P Djan, G Makoro, M Mokoena, P Malate, D Tengu
Departments: Family Medicine, Biostatistics
Presenter: Hanneke Brits

Introduction and aim: Medical students are under immense academic stress. Campus unrest can contribute to added stress and influence academic performance, social behaviour, emotional stability and financial expenses. The aim of this study was to investigate the effects of the #FeesMustFall2016 on the 2016 semester 6 clinical medical students at the University of the Free State.
Methodology: In part 1 of the project anonymous questionnaires were completed by the clinical students that experienced physical test disruption during #FeesMustFall2016. Opinions regarding academic performance, financial expenses, behaviour changes and stress levels were gathered. The students also completed a formal post-traumatic stress screening assessment. In part 2 of the project the academic performance of these students was compared with students not affected by #FeesMustFall2016.
Results: 87% of the target population of 138 students completed the questionnaires. Three quarters reported a negative effect on academic performance and most did not believe that the delivering of lectures on Blackboard was a good way of training. Alcohol consumption increased in 30% of the respondents. Criteria for post-traumatic disorders were met in 12.7% of respondents. Compared to previous and later cohorts of students there were no clear differences regarding marks but there was a tendency towards poorer performance and more failures the next year.
Conclusion: Semester 6 medical students at the UFS reported that the #FMF2016 protests had a negative effect on academic, social, financial and stress aspects. Post-traumatic stress disorder was present in 12.7% of students compared to 7.8-9.2% in similar populations.

Keywords: #Feesmustfall, undergraduate students, academic performance

EP -7

Title: **HOW RELIABLE IS OUR MMED(FAM MED) OSCE ASSESSMENT?**

Authors: H Brits, G Joubert
Department: Family Medicine and Biostatistics
Presenter: Hanneke Brits

Introduction and aim: The Colleges of Medicine of South Africa (CMSA), the examining body for the exit exams of the MMed programmes in South Africa, introduced Objective Structured Clinical Examinations (OSCE's) to enhance the validity and reliability of assessment. According to the guidelines the marks of examiners should not differ with more than 10%. The aim of this study was to investigate the agreement between MMed Family Medicine examiners' OSCE global percentage and calculated marks based on different weightings and categories.
Methodology: This was a cross-sectional study. Seven students rotated through nine stations (five skills and four consultations) and were assessed by three examiners at each station regarding various categories, one of which was clinical competence. Each category was rated as: Not competent (0), Competent (1) or Good (2). The calculated mark consisted of the total of the category marks. Each examiner also gave a global percentage. The average of the three calculated marks was used as the examination mark.
Results: A total of 63 stations were evaluated. Twice as many stations were failed using the calculated marks (34.9%) compared to the global percentage (17.5%). The global percentages were 4-6% higher than the calculated marks for trained examiners and 12-14% higher for untrained examiners. The difference between the global marks of examiners varied between 2 and 9%, with an average of 5.4% while the calculated marks varied between 1 and 22%.
Conclusion: The current MMed OSCE assessment is not reliable using the calculated marks. The marks for the same assessment varied with more than 10% between different examiners. Double the number of stations were failed using the calculated marks compared to the global mark for the same assessment and examiner.

Keywords: Assessment, post-graduate, reliability

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