



# CVJ AFRICA

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CardioVascular Journal of Africa (official journal for PASCAR)

## BIENNIAL CONGRESS

# SOUTHERN AFRICAN HYPERTENSION SOCIETY

## Hypertension Beyond Blood Pressure Management

16 – 18 SEPTEMBER 2022







### Disclaimer

The Abstracts for the Southern African Hypertension Society was reviewed by the SAHS Scientific Committee and not by the Editor-in-Chief, Regional Editors or reviewers of the **Cardiovascular Journal of Africa**. Only accepted abstracts are published.



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SOUTHERN AFRICAN HYPERTENSION SOCIETY

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16 - 18 SEPTEMBER 2022

14 Clinical &amp; 2 Ethical CEU's

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# WELCOME



Dear SAHS Members, Colleagues, and Industry Partners,

Welcome to the SAHS Biennial Congress 2022. The scientific programme will provide opportunities for interdisciplinary learning, interaction, and networking with delegates, International Faculty and local Key Opinion Leaders involved in Hypertension Management.

Sessions will include multiple lectures and debates on Hypertension Beyond Blood Pressure Management of current clinical interest as well as research oral- and poster presentations. On behalf of the Southern African Hypertension Society congress management committee, thank you and welcome to our international and local faculty, delegates, and industry sponsors.

We are looking forward to hosting you at the SAHS biennial Congress, the next 2.5 days.

Prof Nash Ranjith  
SAHS President





# INTERNATIONAL FACULTY



## Professor Claudio Borghi

### Department of Medical and Surgical Sciences

Head of division of Cardiovascular Medicine and Hypertension  
University of Bologna  
Via Massarenti, 9Bologna, Italy

### Biography

Professor Claudio Borghi is Full Professor of Medicine and Head of the Department of Medicine and the ESH Excellence Center for Hypertension and Atherosclerosis at the University of Bologna.

He is director of the post-graduate school on Emergency Medicine and chairman of the PhD program of Health and Technology of the University of Bologna

His research activities have been mainly focused on clinical epidemiology and on the therapeutic approach to cardiovascular risk, with special interests in hypertension, dyslipidemia and related risk factors, including serum uric acid.

Professor Borghi is Past President of the Italian Society of Hypertension. He is currently President of the Italian Foundation for Hypertension. He is chairman of the Research, Science and Educational Committee of the International Society of Hypertension and ex-officio member of the Council of the ESH. He is member of the Nucleus of the ESC Working Group on Pharmacotherapy and Pharmacology.

Dr.Borghi has received the Talhal Zen Award from the European Society of Hypertension for his research on risk factors and cardiovascular disease and the 2022 WHL Peter Sleight Excellence Award in Hypertension Clinical Research from World Hypertension League.



## Professor Alta Schutte

### Professorial Fellow, The George Institute, Australia

Principal Theme Lead: Cardiac, Vascular and Metabolic Medicine, UNSW Sydney

### Biography

Alta (Aletta E.) Schutte is a UNSW SHARP Professor and Principal Theme Lead of Cardiac, Vascular and Metabolic Medicine in the Faculty of Medicine and Health at the University of New South Wales, Sydney, Australia; with a joint appointment as Professorial Fellow at the George Institute for Global Health.

She has been the Principal Investigator of several multidisciplinary studies and has published over 300 papers on the topic of hypertension, and supervised over 85 postgraduate students. She is involved in numerous international consortia, and was one of 20 authors to join the Lancet Commission of Hypertension.

She has received multiple awards including the Distinguished Woman Scientist in the Natural, Engineering and Life Sciences award, the NSTF South 32 TW Kambule Award; the British Association Medal; the Meiring Naude Medal; the AU-TWAS (African Union & The World Academy of Sciences) Award, and the 2019 African Union Kwame Nkrumah Regional Award for Scientific Excellence.

She serves as Editor of the European Journal of Preventive Cardiology and on the Editorial Board of cardiovascular journals, such as Hypertension, the Journal of Hypertension, Journal of Clinical Hypertension, Journal of Human Hypertension, Current Hypertension Reports and BMC Medicine. She is a Fellow of the European Society of Cardiology and the Royal Society of South Africa; the Past President of the Southern African Hypertension Society (SAHS); and Immediate Past President of the International Society of Hypertension (ISH).



## Professor Neil Poulter

### Faculty of Medicine, School of Public Health

Professor of Preventive Cardiovascular Medicine.

### Biography

Professor Neil Poulter qualified at St Mary's Hospital, London, in 1974, following which he trained in General Medicine. He then spent 5 years in Kenya co-ordinating a collaborative hypertension research programme at the Wellcome Trust Research Laboratories in Nairobi.

He gained an MSc in Epidemiology with distinction at the London School of Hygiene and Tropical Medicine. He was Co-PI of the WHO Oral Contraceptive case-control Study at University College London Medical School.

He is co-Director of the International Centre for Circulatory Health and Director of the Imperial Clinical Trials Unit. He is an Honorary Consultant Physician and Epidemiologist at the Peart-Rose (CVD Prevention) Clinic based at Hammersmith Hospital, London, where he is actively involved in the treatment of patients with hypertension and related problems.

He was President of the British Hypertension Society from 2003-2005 and is the immediate Past-President of the International Society of Hypertension. In 2008, he was elected as one of the Inaugural Senior Investigators of the NIHR and also elected as a fellow of the Academy of Medical Sciences in 2009.

He has contributed chapters to several major textbooks and published over 500 papers in peer-reviewed medical journals, including co-authoring several sets of national and international guidelines. Professor Poulter was identified as being among the top 1% most cited academics in clinical medicine in 2014 (Thomson Reuters Highly Cited Researcher report) and among the top 0.1% most cited researcher between 2008-2018 (Web of Science Group Highly Cited Researcher 2019 report).

He has played a senior management role in several international trials including the ASCOT, ADVANCE, EXSCEL, DEVOTE, LEADER and CREOLE trials; other research activities include the optimal investigation and management of essential hypertension and dyslipidaemia; the association between birth weight and various cardiovascular risk factors; the cardiovascular effects of exogenous oestrogen and progesterone; the prevention and aetiology of type 2 diabetes and abdominal aortic aneurism; and ethnic differences in cardiovascular disease. He is the Chief Investigator of the May Measurement Month, an annual global blood pressure screening campaign initiated by the International Society of Hypertension.





# LOCAL FACULTY

Dr Rajendra Bhimma

Dr Tony Dalby

Dr Riaz Dawood

Dr Meagan Dudley

Prof Lebo Gafane-Matemané

Prof Erika Jones

Prof Ruan Kruger

Dr Karishma Lowton

Prof Carina Mels

Prof Girish Modi

Dr Rajen Moodley

Dr Martin Mpe

Ms Nonhlanhla Mthembu

Ms Nonkululeko Navise

Prof Gavin Norton

Dr Vernice Peterson

Prof Nash Ranjith

Prof Brian Rayner

Prof Nqoba Tzabedze

Dr Bridget Vermeulen

Dr Lisa Ware

Prof Angela Woodiwiss



## SAHS Congress 2022 Key Partners

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## Scientific Programme

Southern African Hypertension Society Biennial Congress - Hypertension Beyond Blood Pressure Management  
16 - 18 September 2022, Sandton (Gauteng)

**14 Clinical & 2 Ethics CEU's**

International Faculty: Prof Neil Poulter (UK), Prof Claudio Borghi (Italy), Prof Alta Schutte (Australia) & Local Key Opinion Leaders

### Friday, 16 September 2022

Time	Topic	Speakers   Chair	Venue
08:00 - 09:20	Arrival & Registration		
09:20 - 11:00	<b>Plenary Session 1: Guidelines and Controversial Issues</b>	<b>Chairs:</b> Prof Nash Ranjith   Dr Martin Mpe	Pandora
09:20 - 09:30	Opening & Welcome	Prof Nash Ranjith	
09:30 - 10:00	Recent diabetic trials on SGLT2 inhibitor effects related to cardiovascular risk and heart failure and renal protection	Prof Nash Ranjith	
10:00 - 10:30	How to measure blood pressure in the light of new technologies <b>[OMRON]</b>	Prof Alta Schutte	
10:30 - 11:00	Non-adherence as a cardiovascular risk factor and how to detect and improve adherence <b>[SANDOZ]</b>	Prof Brian Rayner	
11:00 - 11:30	TEA & COFFEE BREAK		Aurora-Exhibition Hall   Conference Foyer
11:00 - 11:30	<b>Poster Presentations</b>	<b>SAHS Adjudicators:</b> Prof Ruan Kruger   Dr Vernice Peterson   Prof Lebo Gafane - Matemane   Sr Adele Burger	Comet
11:00 - 11:05	A comparison of retinal vessel functional responses between people living with HIV and HIV-free South Africans: Findings from the EndoAfrica-NWU study	Dr Catharina Elizabeth Myburgh-Jacobsz	
11:05 - 11:10	Selenium and cardiovascular protection in young adults: The African-PREDICT study	Dr Yolandi Breet	
11:10 - 11:15	Posterior inferior cerebellar artery impingement on the medulla oblongata: a case report	Poobalan Naidoo	
11:15 - 11:20	Kidney dysfunction: prevalence and associated risk factors in a community-based study from the North West Province of South Africa	Nonkululeko Navise	
11:20 - 11:25	Emotional and social contributors to higher blood pressure in children with a low quality of life: The ExAMIN Youth SA study	Chanelle Volschenk	
11:25 - 11:30	Association between central blood pressure and arterial stiffness and low cognitive scores in South African adults	Dr Feziwe Mpondo	
11:30 - 13:00	<b>Plenary Session 2: Innovative Approaches to improve Treatment and Control</b>	<b>Chairs:</b> Prof Claudio Borghi   Prof Erika Jones	Pandora
11:30 - 12:00	What's new in the hypertension guidelines <b>[PHARMA DYNAMICS]</b>	Prof Neil Poulter	
12:00 - 12:15	May Measurement Month South Africa	Prof Angela Woodiwiss	
12:15 - 12:35	Population based approaches to reduce BP <b>[OMRON]</b>	Prof Alta Schutte	
12:35 - 13:00	Managing Hypertension: Importance of lifestyle changes in conjunction with medication <b>[PHARMA DYNAMICS]</b>	Prof Neil Poulter	
13:00 - 14:00	LUNCH AND MEET THE EXPERTS	Prof Claudio Borghi   Prof Alta Schutte	Aurora-Exhibition Hall   Conference Foyer
14:00 - 15:30	<b>Plenary Session 3: Hypertension and co-morbidities</b>	<b>Chairs:</b> Dr Rajen Moodley   Dr Meagan Dudley	Pandora
14:00 - 14:20	Facing the challenge of lowering blood pressure and cholesterol in the same patient <b>[SERVIER]</b>	Prof Claudio Borghi	
14:20 - 14:40	Patient with hypertension and heart failure <b>[BAYER]</b>	Prof Nqoba Tsabedze	
14:40 - 15:00	Chronic kidney disease: Hypertension management and treatment targets	Prof Erika Jones	
15:00 - 15:30	Gaps between evidence and guideline recommendations for hypertension diagnosis and targets <b>[SERVIER]</b>	Prof Claudio Borghi	
15:30 - 16:00	TEA & COFFEE BREAK		Aurora-Exhibition Hall   Conference Foyer
15:30 - 16:00	<b>Poster Presentations</b>	<b>SAHS Adjudicators:</b> Prof Ruan Kruger   Dr Vernice Peterson   Dr Meagan Dudley   Sr Adele Burger	Comet
15:30 - 15:35	Deprescribing to Improve Polypharmacy	Miss Precious Ncayiyana	
15:35 - 15:40	The Value of Admission HbA1c in patients with Acute Myocardial Infarction	Dr Dhayanee Sigamoney-Mudaly	
15:40 - 15:45	Determinants of functional capacity in patients with chronic heart failure: Role of filling pressure and systolic and diastolic function	El Mousaid Meriem	
15:45 - 15:50	Hemoglobinopathies and dilated cardiomyopathy at the CHU Ibn Rochd-Casablanca	El Mousaid Meriem	
16:00 - 17:00	<b>Plenary Session 4: Hypertension and Infectious Diseases</b>	<b>Chairs:</b> Prof Brian Rayner   Dr Lebo Gafane-Matemane	Pandora
16:00 - 16:20	HIV and cardiovascular risk in South Africans	Prof Carina Mels	
16:20 - 16:40	Drug treatment of hypertension and adverse effects in the hypertensive HIV patient	Dr Martin Mpe	
16:40 - 17:00	Hypertension and COVID	Prof Nqoba Tzabedze	
17:00 - 18:00	<b>Plenary Session 5: Gender and Special Populations</b>	<b>Chairs:</b> Prof Neil Poulter   Prof Ruan Kruger	Pandora
17:00 - 17:20	Gender related issues in hypertension	Dr Vernice Peterson	
17:20 - 17:40	Hypertension in pregnancy - How to implement the guidelines	Prof Erika Jones	
17:40 - 18:00	Hypertension- oncology A new clinical problem	Dr Rajen Moodley	
19:00	FACULTY DINNER		The Capital on Park Restaurant

## Scientific Programme

Southern African Hypertension Society Biennial Congress - Hypertension Beyond Blood Pressure Management

16 - 18 September 2022, Sandton (Gauteng)

14 Clinical & 2 Ethics CEU's

International Faculty: Prof Neil Poulter (UK), Prof Claudio Borghi (Italy), Prof Alta Schutte (Australia) & Local Key Opinion Leaders

### Saturday, 17 September 2022

Time	Topic	Speakers   Chair	Venue
07:30 - 08:30	Breakfast		
08:30 - 10:15	<b>Plenary Session 6: Hands-on Hypertension</b>	<b>Chairs:</b> Prof Ranjith   Prof Brian Rayner	Pandora
08:30 - 09:05	Debate: Heart rate an independent risk factor in heart disease <b>[MERCK]</b>	Prof Claudio Borghi   Dr Martin Mpe	
09:05 - 10:15	<b>Oral Presentations: (Basic, Clinical and Population)</b>	<b>SAHS Adjudicators:</b> Prof Ruan Kruger   Prof Angela Woodiwiss   Prof Carina Mels   Prof Brian Rayner	
09:05 - 09:12	Cardiovascular risk and kidney function profiling using conventional and novel biomarkers in young adults: The African-PREDICT study	Anja Degenaar	
09:12 - 09:19	Perfusion and pulsatile pressure and the relationship with target organ damage: The African-PREDICT study	Donavan Rooi	
09:19 - 09:26	Carotid arterial stiffness associates with endothelial activation in young adults: The African-PREDICT study	Prof Shani Le Roux	
09:26 - 09:33	Risk factor profile of female patients presenting with acute myocardial infarction: a South African perspective	Prof Naresh Ranjith	
09:33 - 09:40	Comparison of cardiovascular health profiles across population surveys from five high- to low-income countries	Dr Bridget Vermeulen	
09:40 - 09:47	Independent Relationship Between Volume Overload and Aortic Stiffness in a Community with Prevalent Volume-Dependent Primary Hypertension	Grace Tade	
09:47 - 09:54	Relative Impact of Volume-Dependent Variations in Aortic Reservoir Function Versus Pressure Wave Effects on Pulse Pressure and Cardiac Mass at a Community Level	Gavin R Norton	
09:54 - 10:01	Impact of Thiazide-Like Diuretic Based Therapy on Increases in Systemic Blood Flow in Volume-Dependent Hypertension in Africa	Vernice R Peterson	
10:01 - 10:08	Proximal Aortic Stiffness Modifies the Relationship between Heart Rate and Backward Wave and hence Central Arterial Pulse Pressure	Nonhlanhla Mthembu	
10:08 - 10:15	Marked Increases in Proximal Aortic Characteristic Impedance and hence Forward Wave Pressures Beyond Brachial Blood Pressure in Patients with Angiographic Proven Coronary Artery Disease	Danelle Els	
08:30 - 10:15	<b>Nurses   Doctors Parallel Session 1</b>	<b>Chair:</b> Prof Erika Jones	Pandora 1
08:30 - 09:00	How to diagnose hypertension - Current criteria, tips and tricks	Dr Rajen Moodley	
09:00 - 09:25	Lifestyle Interventions & Patient counselling <b>[OMRON]</b>	Prof Ruan Kruger	
09:25 - 09:45	The nutrition source - salt and sodium	Dr Lisa Ware	
09:45 - 10:15	Devices validation and calibration <b>[OMRON]</b>	Prof Alta Schutte	
10:15 - 10:45	TEA & COFFEE BREAK		Aurora-Exhibition Hall   Conference Foyer
10:15 - 10:45	<b>Poster Presentations</b>	<b>SAHS Adjudicators:</b> Dr Vernice Peterson   Prof Erika Jones   Prof Lebo Gafane - Matemane   Dr Meagan Dudley	Comet
10:15 - 10:20	Results for the May Measurement Month global campaign from a university campus	Ane' Orchard	
10:20 - 10:25	L-homoarginine, cardiovascular function and mortality risk in Black South Africans	Maserame Cleopatra Mokhaneli	
10:25 - 10:30	Influence of different grades of CKD and HD on cardiac function using myocardial strain: Longitudinal Global Strain	El Mousaid Meriem	
10:30 - 10:35	Obesity paradox in patients with stable angina	El Mousaid Meriem	
10:45 - 12:00	<b>Plenary Session 7</b>	<b>Chairs:</b> Dr Martin Mpe   Prof Angela Woodiwiss	Pandora
10:45 - 11:10	How to stratify CV risk   Resistant HPT <b>[SERVIER]</b>	Prof Claudio Borghi	
11:10 - 11:35	Mechanisms of how intense BP lowering is beneficial in high risk populations	Prof Gavin Norton	
11:35 - 12:00	Systolic vs Diastolic BP as predictors of CV risk <b>[PHARMA DYNAMICS]</b>	Prof Neil Poulter	
10:45 - 12:00	<b>Nurses   Doctors Parallel Session 2</b>	<b>Chair:</b> Prof Carina Mels	Pandora 1
10:45 - 11:00	Side effects of commonly used anti-hypertensive drugs. What to look for?	Dr Meagan Dudley	
11:00 - 11:15	The importance of BP control (basic) & HPT definitions - When to refer? <b>[OMRON]</b>	Prof Alta Schutte	
11:15 - 12:00	<b>Ethics:</b> Mental health for the cardiovascular patient and medical personnel	Dr Karishma Lowton	
12:00 - 13:00	LUNCH		Aurora-Exhibition Hall   Conference Foyer
13:00 - 14:30	<b>Plenary Session 8: Device Therapy for Hypertension</b>	<b>Chairs:</b> Prof Brian Rayner   Prof Ngqoba Tsabedze	Pandora
13:00 - 13:30	Renal denervation - Review of the latest data <b>[MEDTRONIC]</b>	Dr Riaz Dawood	
13:30 - 14:00	Device therapy for acute stroke management	Prof Girish Modi	
14:00 - 14:30	Hypertension and acute coronary syndrome focus on cardiac intervention	Dr Tony Dalby	
14:30 - 15:00	TEA & COFFEE BREAK		Aurora-Exhibition Hall   Conference Foyer



## Saturday, 17 September 2022

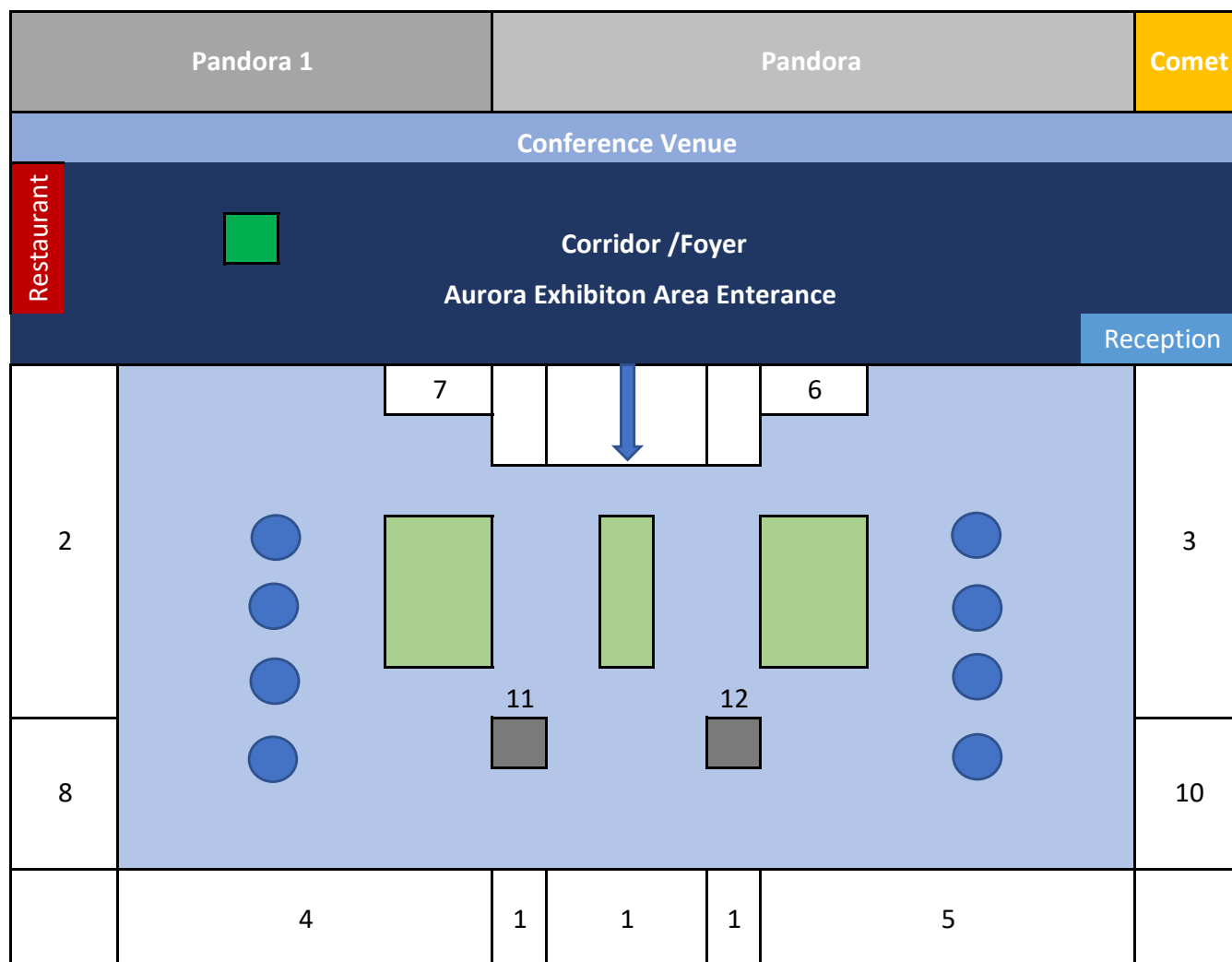
Time	Topic	Speakers   Chair	Venue
14:30 - 15:00	<b>Poster Presentations</b>	<b>SAHS Adjudicators:</b> Prof Erika Jones   Prof Carina Mels   Prof Gavin Norton   Sr Adele Burger	Comet
14:30 - 14:35	Eradication of Helicobacter spp. in spontaneously hypertensive rats reduces blood pressure to that of ancestral Wistar Kyoto rats	Sarhana Dinat	
14:35 - 14:40	Understanding the inter-relationships between socio-economic, socio-demographic, behavioural, and environmental factors for multimorbidity: a structural equation modelling approach	Glory Chidumwa	
14:40 - 14:45	Assessment of left ventricular systolic and diastolic function in patients with asymptomatic Type 2 diabetes	Mahoungou Mackonia Noel Maschell	
14:45 - 14:50	Intracardiac stenosing mass of the mitral valve: a case report.	Mahoungou Mackonia Noel Maschell	
14:50 - 14:55	Longitudinal global strain as a prognostic element in moderately reduced ejection fraction heart failure	Mahoungou Mackonia Noel Maschell	
14:55 - 15:00	Cognitive disorders: Atherosclerosis of the carotid artery in elderly non-stroke patients	Mahoungou Mackonia Noel Maschell	
15:00 - 16:50	<b>Plenary Session 9: Hypertension in Special Populations</b>	<b>Chairs:</b> Prof Gavin Norton   Dr Vernice Peterson	Pandora
15:00 - 15:20	Early vascular aging in the young	Prof Ruan Kruger	
15:20 - 15:45	Practical approach to a young hypertensive	Prof Neil Poulter	
15:45 - 16:10	Pathogenesis of hypertension in Africa	Prof Angela Woodiwiss	
16:10 - 17:20	<b>Oral Presentations: (Basic, Clinical and Population)</b>	<b>SAHS Adjudicators:</b> Prof Erika Jones   Prof Ruan Kruger   Dr Vernice Peterson   Prof Brian Rayner	Pandora
16:10 - 16:17	Independent Relationship between Circulating Atrial Natriuretic Peptide Concentrations and Endothelial Function in a Population with Age-Related Systemic Volume Overload.	Nico Malan	
16:17 - 16:24	Associations between kidney function and the soluble (pro)renin receptor in young adults: The African-PREDICT study	Lebo F Gafane-Matemané	
16:24 - 16:31	Contribution of Increases in Late Systolic Ejection Volume to the Impact of Heart Rate on Central Arterial Pulse Pressure in a Community Sample	Angela J Woodiwiss	
16:31 - 16:38	Hypertension perspectives and health behaviours among African youth: the impact of health education and employment.	Mimi Mhlaba	
16:38 - 16:45	Attenuated Relationships Between Indexes of Volume Overload and Atrial Natriuretic Peptide in Uncontrolled, Sustained Volume-Dependent Primary Hypertension.	Suraj M. Yusuf	
16:45 - 16:52	Influence of Diabetes Mellitus on Early and Late Outcome After Percutaneous Transluminal Coronary Angioplasty	El Mousaid Meriem	
16:52 - 16:59	Causes of Hypertension at a Children's Hospital in Cape Town, South Africa	Bonisiwe Chauke-Mkamba	
17:20 - 17:50	<b>SAHS AGM 2022</b>	<b>SAHS members</b>	Pandora
19:00	<b>CONGRESS DINNER</b>	Prof Ranjith Welcome & Open Awards: Dr Mpe   Prof Brian Rayner - Vote of thanks	Pandora 1

## Sunday, 18 September 2022

Time	Topic	Speakers   Chair	Venue
07:00 - 08:40	<b>Breakfast</b>		The Capital on Park Restaurant
08:45 - 10:00	<b>Plenary Session 10</b>	<b>Chairs:</b> Angela Woodiwiss   Prof Ruan Kruger	Pandora
08:45 - 09:05	A practical approach to syncope	Prof Girish Modi	
09:05 - 09:25	The heart and hypertension	Prof Gavin Norton	
09:25 - 09:30	Introduction to the SAHS NextGen	Prof Ruan Kruger	
09:30 - 09:40	Left ventricular remodelling and growth differentiating factor-15 in overweight and obesity: The African-PREDICT study.	Dr Bridget Vermeulen	
09:40 - 09:50	The association of von Willebrand factor and its cleaving protease (ADAMTS13) with health behaviours in young black and white adults: The African-PREDICT study	Ms Nonkululeko Navise	
09:50 - 10:00	Mechanisms of Heart Rate Effects on Central Arterial Pressure: Overinflation of the Role of Flow in an African Community	Ms Nonhlanhla Mthembu	
10:00 - 10:30	<b>TEA AND COFFEE BREAK</b>		Aurora-Exhibition Hall / Conference Foyer
10:30 - 12:05	<b>Plenary Session 11: Hypertension and Relevant Clinical Problems</b>	<b>Chairs:</b> Prof Nash Ranjith   Prof Alta Schutte	Pandora
10:30 - 10:50	Should white coat hypertension be left untreated?	Prof Brian Rayner	
10:50 - 11:10	Hypertension in the very elderly [epidemiological aspects and treatment]	Prof Ngoba Tsabedze	
11:10 - 11:55	<b>Ethics:</b> Informed consent in clinical studies	Dr Rajendra Bhimma	
11:55 - 12:05	<b>CLOSING ADDRESS AND DEPART</b>	Prof Nash Ranjith	Pandora

# SAHS Biennial Congress 2022

## EXHIBITION HALL LAYOUT



*Basement Parking Available*

### Exhibition Room: Aurora

#### Platinum:

- 1 Omron
- 2 Servier
- 3 PharmaDynamics


#### Gold:

- 4 Sandoz
- 5 Merck

#### Silver

- 7 Cipla
- 8 Novartis
- 9  Bayer
- 10 Aspen

#### Bronze:

- 6 Medtronic
- 11 Boehringer-Ingelheim
- 12 Astra Zeneca
-  Tea/Coffee & Lunch Stations



Pillars



Meet Expert



Reception



Restaurant



Comet



Pandora  
Plenary



Pandora 1  
Parallel





# GENERAL INFORMATION

## REGISTRATION

Situated in the exhibition foyer of The Capital on the Park and is open from 08h00 daily.

## NAME BADGES

Delegates are required to display their Congress badge at all times during the meeting. Only participants wearing a Congress badge will be admitted. No exceptions to this rule will be made due to security reasons. Your co-operation is appreciated.

## CONGRESS DINNER

Name Badges of Delegates attending the congress dinner have a unique identifier. Delegates are required to display their Congress badge when attending the Congress Dinner.

## CPD ACCREDITATION

We will require all Delegates, Faculty & Trade that wish to receive CPD points to complete the electronic Confirmation of Attendance Affidavit. A Scan with Smartphone Camera option is available at the Congress and an email will be sent to all delegates at the end of the Congress.

## DRESS CODE

Congress Sessions - Smart Casual.

## EXHIBITION

The Exhibition will take place in the Aurora Venue. Companies will exhibit their products and will be available to answer questions. We encourage delegates to meet and interact with the companies daily.

## MEET THE EXPERTS

We encourage delegates to meet and interact with our international speakers during lunch, please join them. An area is set-up in Venue Foyer.

## TEA & LUNCHES

Refreshments and lunches will be served in the Aurora Venue and Foyer throughout the Congress.

## VENUE CAPACITY

Each session room has limited capacity, and we are unable to reserve seats, therefore, once the room is full, for security reasons we will be unable to permit further access.

## DISCLAIMER

The Organising Committee and the Congress Organiser accept no liability for any damages, injuries, and/or losses of whatever nature incurred by the participants and/or accompanying persons.

For assistance or emergencies, contact the Congress Organising Team or visit the reception for assistance.  
Precious Kgomo: +27 074 693 3553

## Congress Venue Address

The Capital on the Park Sandton, 101 Katherine St, Sandton | Tel: 010 443 0000









## ORAL PRESENTATION

Entry Id	Page no	Name:
1344	16	Anja Degenaar
1345	18	Donavan Rooi
1346	19	Prof Shani Le Roux
1361	20	Prof Naresh Ranjith
1362	21	Angela J Woodiwiss
1363	23	Gavin R Norton
1364	25	Suraj M. Yusuf
1365	27	Vernice R Peterson
1368	29	Nonhlanhla Mthembu
1369	30	Bonisiwe Chauke-Mkamba
1371	31	Danelle Els
1372	33	Mimi Mhlaba
1374	34	Nico Malan
1375	36	Grace Tade
1386	38	Lebo F Gafane-Mateman
1391	39	EL Mousaid Meriem
1397	40	Dr Bridget Vermeulen

## POSTER PRESENTATION

Entry Id	Page no	Name:
1356	42	Mahoungou Mackonia Noel Maschell
1340	43	Miss Precious Ncayiyana
1341	44	Nonkululeko Navise
1342	45	Dr Dhyanee Sigamoney-Mudaly
1343	46	Dr Catharina Elizabeth Myburgh-Jacobsz
1348	48	Dr Yolandi Breet
1349	50	Dr Feziwe Mpondo
1353	52	EL Mousaid Meriem
1357	53	Mahoungou Mackonia Noel Maschell
1359	54	Mahoungou Mackonia Noel Maschell
1366	55	EL Mousaid Meriem
1367	56	EL Mousaid Meriem
1370	57	Poobalan Naidoo
1377	58	Chanelle Volschenk
1380	59	Mahoungou Mackonia Noel Maschell
1381	60	Glory Chidumwa
1382	61	Ane' Orchard
1383	62	Sarhana Dinat
1384	63	Alexander G. Arutyunov
1385	65	Maserame Cleopatra Mokhaneli
1388	66	EL Mousaid Meriem

## SAHS Congress 2022 Key Partners

### PLATINUM



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### BRONZE



Boehringer  
Ingelheim

**Medtronic**

Engineering the extraordinary

Submission ID: 1344

## Presenting Author Information

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## Article

### Category

Basic Sciences

### Abstract Title

Cardiovascular risk and kidney function profiling using conventional and novel biomarkers in young adults: The African-PREDICT study

### English Abstract

#### Introduction

Low- and middle-income countries experience an increasing burden of chronic kidney disease. Cardiovascular risk factors, including advancing age, may contribute to this phenomenon. We i) profiled cardiovascular risk factors (age, adiposity, blood pressure, glucose, lipid profiles and lifestyle factors) and biomarkers of kidney function (in young adults aged 20-30 years); and ii) investigated whether these biomarkers differed across age groups.

#### Methods

Biomarkers of kidney function, including estimated glomerular filtration rate (eGFR), urinary albumin-to-creatinine ratio, alpha-1 microglobulin, neutrophil gelatinase-associated lipocalin (NGAL), uromodulin and the CKD273 urinary proteomics classifier, were used to divide the total population into quartiles to compare extremes (25th percentiles) on the normal kidney function continuum. The lower 25th percentiles of eGFR and uromodulin and the upper 25th percentiles of urinary albumin-to-creatinine ratio, alpha-1 microglobulin, NGAL, and the CKD273 classifier represented the more unfavourable kidney function groups.

#### Results








In the more unfavourable kidney function groups, adiposity markers and blood pressure were higher and adverse lipid profiles (all  $p < 0.05$ ) were present. Age was only higher in the more unfavourable eGFR and CKD273 classifier groups (all  $p < 0.001$ ). In the total group, eGFR declined while the CKD273 classifier score increased with increasing age (both  $p$ -trend  $< 0.05$ ). Lower eGFR ( $p < 0.001$ ) and NGAL ( $p < 0.05$ ) levels increased the odds of being in the upper CKD273 classifier percentile.

#### Conclusion

Even in a young and healthy cohort a more unfavourable kidney function profile was associated with cardiovascular risk factors.

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### Cardiovascular risk and kidney function profiling using conventional and novel biomarkers in young adults: The African-PREDICT study

Cohort	Methods	Results
 Cross sectional study (N=948)  Participants of the African-PREDICT study  Healthy individuals aged 20-30 years	 <b>Measures of kidney function:</b> <ul style="list-style-type: none"> <li>eGFR</li> <li>uACR</li> <li>A1M</li> <li>NGAL</li> <li>UMOD</li> <li>CKD273</li> </ul> <b>More unfavorable kidney function:</b> <ul style="list-style-type: none"> <li>↓ eGFR, UMOD</li> <li>↑ uACR, A1M, NGAL, CKD273</li> </ul>	 <b>Profiling of cardiovascular risk factors</b> In the more unfavorable kidney function groups <ul style="list-style-type: none"> <li>↑ Age</li> <li>↑ Blood pressure</li> <li>↑ Adiposity</li> <li>↑ Adverse lipid profiles</li> </ul>  <b>Comparing biomarkers across age groups</b> <ul style="list-style-type: none"> <li>eGFR ↓ with age (<math>p &lt; 0.001</math>)</li> <li>CKD273 classifier score ↑ with age (<math>p &lt; 0.05</math>)</li> </ul>  <b>↑ Odds of being in the upper 25<sup>th</sup> percentile of the CKD273 classifier</b> <ul style="list-style-type: none"> <li>↓ eGFR (<math>p &lt; 0.001</math>)</li> <li>↓ NGAL (<math>p &lt; 0.05</math>)</li> </ul>

eGFR, estimated glomerular filtration rate

uACR, urinary albumin-to-creatinine ratio

A1M, alpha-1 microglobulin

NGAL, neutrophil gelatinase-associated lipocalin

UMOD, uromodulin

Degenaar et al., 2022

**CONCLUSION** More unfavourable kidney function is associated with several cardiovascular risk factors. Furthermore, even in young apparently healthy adults, different kidney function biomarkers can already identify a decline in kidney function.

Submission ID: 1344 *continued*

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## Article

### Category

Basic Sciences

### Abstract Title

Perfusion and pulsatile pressure and the relationship with target organ damage: The African-PREDICT study

### English Abstract

#### Introduction

Hypertension and increased blood pressure can cause pathophysiological changes that result in subclinical target-organ damage (TOD). Pulsatile pressure (pulse pressure (PP)) has been associated with cardiovascular disease (CVD) but research is incongruent regarding the association of perfusion pressure (mean arterial pressure (MAP)) with CVD. Furthermore, limited literature exists on the strength of associations between different pressure measures with subclinical TOD, especially in young populations. Thus, the researchers aimed to compare the strength of associations of subclinical TOD markers with perfusion and pulsatile pressure in young South African adults.

#### Methods

This study included 1 187 young (aged 20-30 years), normotensive black and white participants from the African-PREDICT study. Twenty-four-hour MAP and 24-hour PP measurements were obtained, as well as measures of subclinical TOD: echocardiography, to determine left ventricular mass index (LVMI), carotid intima-media thickness (cIMT) with ultrasound, carotid-femoral pulse wave velocity (cfPWV) using a femoral cuff and applanation tonometry, central retinal arteriolar equivalent (CRAE) from fundus images and albumin to creatinine ratio (ACR) determined from spot urine samples.

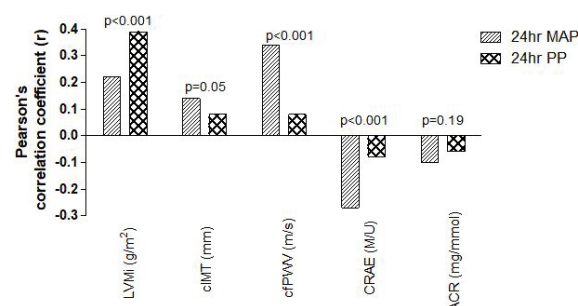
#### Results

Stronger correlations were found between cIMT, cfPWV, and CRAE with perfusion pressure (all  $p < 0.001$ ) when compared to pulsatile pressure. Stronger independent associations were found with cfPWV (adjusted  $R^2 = 0.26$ ) and CRAE (adjusted  $R^2 = 0.12$ ) with perfusion pressure (all  $p \leq 0.001$ ) when compared to pulsatile pressure.

#### Conclusion

In young, healthy adults, perfusion pressure correlated stronger with subclinical TOD markers when compared to pulsatile pressure.

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## Article

## Category

Basic Sciences

## Abstract Title

Carotid arterial stiffness associates with endothelial activation in young adults: The African-PREDICT study

## English Abstract

## Introduction

The role of endothelial activation in atherosclerosis is known, but limited studies exist on endothelial activation in asymptomatic individuals. We investigated the relationship between carotid arterial stiffness and markers of endothelial activation in young healthy adults.

## Methods

We included 1197 individuals with a median age of 24 years (25th & 75th percentiles: 22-27).

Carotid strain, distensibility, compliance, beta-stiffness index (BSI), Peterson's elastic modulus (PEM), Young's elastic modulus (YEM) and carotid intima-media thickness (cIMT) were determined from B-mode ultrasonography. Intercellular adhesion molecule-1 (ICAM-1), vascular cell adhesion molecule-1 (VCAM-1), P-selectin and monocyte chemoattractant protein 1 (MCP-1) were analysed.

## Results

VCAM-1 was highest and P-selectin lowest in the lowest tertile of strain, distensibility and compliance, and in the highest tertile of BSI, PEM and YEM (all  $p \leq 0.028$ ), but not cIMT. In multivariable-adjusted and binomial logistic regression analyses, stiffness measures associated with higher VCAM-1 [strain ( $\beta = -0.14$ , OR=0.73); distensibility ( $\beta = -0.12$ , OR=0.72); compliance ( $\beta = -0.11$ , OR=0.76); BSI ( $\beta = 0.10$ , OR=1.32); PEM ( $\beta = 0.10$ , OR=1.30); YEM ( $\beta = 0.10$ , OR=1.25); all  $p \leq 0.001$ ] and higher ICAM-1 [compliance ( $\beta = -0.06$ ), strain (OR=0.88); all  $p \leq 0.045$ ], but lower P-selectin [strain ( $\beta = 0.10$ , OR=1.17); distensibility ( $\beta = 0.08$ , OR=1.18); compliance ( $\beta = 0.09$ ); BSI ( $\beta = 0.11$ , OR=0.82); PEM ( $\beta = -0.09$ , OR=0.82); YEM ( $\beta = 0.09$ , OR=0.85); all  $p \leq 0.016$ ] as well as lower MCP-1 [strain ( $\beta = 0.07$ ); distensibility ( $\beta = 0.06$ , OR=1.17); compliance ( $\beta = 0.08$ , OR=1.23); BSI ( $\beta = 0.07$ , OR=0.85); YEM ( $\beta = -0.06$ , OR=0.86); all  $p \leq 0.043$ ].

## Conclusion

We found adverse relationships between measures of carotid arterial stiffness and markers of endothelial activation in healthy adults, suggesting that the development of arterial stiffness may be mediated by early onset endothelial activation.

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## Article

### Category

Clinical

### Abstract Title

Risk factor profile of female patients presenting with Acute Myocardial Infarction: A South African perspective

### English Abstract

#### Introduction

Coronary artery disease [CAD] is a major cause of morbidity and mortality, and although previously reported to be more common in men, is now identified as a leading cause of death and disability in women. Significant differences occur between men and women with respect to the epidemiology, diagnosis, treatment, and prognosis of CAD. In the past, women were often under-represented in many CAD studies, leading to misdiagnosis and inappropriate treatment. There is a paucity of data on the prevalence and mortality outcome of CAD in women from developing countries like South Africa.

This study investigated the incidence of acute myocardial infarction [AMI] in women in a regional hospital in Durban, South Africa, with respect to risk profiles and major adverse cardiac events [MACE].

#### Methods

This was a single-center retrospective study conducted at the Coronary Care Unit at RK Khan Hospital, between 2003 to 2016 in female patients with acute myocardial infarction [AMI].

Demographic and clinical data stored in an electronic database were obtained from all patients. Patients with ST elevation MI (STEMI) who were eligible for thrombolysis received Metalyse as a reperfusion therapy. Only patients who consented for both coronary angiography and revascularization were referred to a tertiary hospital due to limited resources. The occurrence of MACE was recorded during hospital admission and 6 months post-discharge. Routine biochemistry was performed on admission using standardized techniques.

#### Results

A total of 1311 females were screened of whom 1160 patients were eligible for analyses. The mean age of the study population was  $61.6 \pm 10.7$  years and they were stratified into 2 age groups; < than 65 years [n= 666 (57.4%)] and  $\geq 65$  years [n= 494 (42.6%)].

The commonest risk factors included dyslipidaemia [97.4%], hypertension [77%], diabetes [75.6%], and a family history of premature atherosclerosis [59%]. When adjusted for age, a significantly greater number of patients < 65 years had dyslipidaemia [P=0.038], obesity [P<0.001], smoking [P<0.001], and family history of premature atherosclerosis [P<0.001]. In contrast, patients  $\geq 65$  years were significantly more likely to present with hypertension [P<0.001], a previous history of AMI [P=0.004] and angina [P= 0.03].

MACE were observed in 40.2% [n=466] with older patients having a significantly higher prevalence compared to their younger counterparts [46.8% vs 35.3%, P< 0.001]. Cardiac failure [54.4%] and death [28.1%] were the most common adverse events seen. Most patients presented with ST elevation MI [74%] with 28% receiving pharmacological reperfusion.

Only 337 patients [29%] were subjected to angiographic studies with the majority having triple vessel disease [48.7%], double vessel disease [22.6 %], single vessel disease [22.6%] and normal coronary epicardial vessels [6.2%]. Following multivariable logistic regression analysis, hyperglycaemia [p=0.006], hyperuricaemia [p= 0.001] and hypertriglyceridaemia [p= 0.014] were significantly associated with MACE.

#### Conclusion

Our study showed that women presented at a younger age and have multiple risk factors for AMI. A high proportion of patients experienced MACE particularly cardiac failure and death. This highlights the importance of vigilant screening and earlier intervention in women with risk factors that predispose them to CAD.

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## Article

### Category

Population Sciences

### Abstract Title

Contribution of Increases in Late Systolic Ejection Volume to the Impact of Heart Rate on Central Arterial Pulse Pressure in a Community Sample

### English Abstract

#### Introduction

Heart rate (HR) lowering agents such  $\beta$ -adrenoreceptor blockers used for the management of hypertension in patients with cardiac conditions, increase central arterial (PPc), but not brachial pulse pressure (PP). However, the mechanisms of this effect are uncertain. A lower heart rate (HR) increases left ventricular (LV) ejection volume and hence systemic flow. Whether this contributes to the adverse effects of HR on central pulse pressure (PPc) through reservoir volume effects, is unknown.

#### Methods

Using non-invasive central pressure, aortic velocity and diameter measurements in the outflow tract (echocardiography), we assessed the role of LV ejection volume as a determinant of HR relations with PPc in 824 community participants.

#### Results

A lower HR was independently associated with both stroke volume (SV) ( $p < 0.001$ ) and a shift in ejection volume from early (until the first systolic shoulder) to late (from first systolic shoulder to peak PP) systole ( $p < 0.05$  to  $p < 0.005$ ). Adjustments for LV end diastolic volume (EDV) markedly diminished HR relations with SV and indexes of the shift in ejection volume to late systole. A lower HR was also independently associated with increases in both forward travelling pressure waves (Pf) and PPc ( $p < 0.0001$ ). However, adjustments for neither SV, nor indexes of a shift in ejection volume to late systole modified HR-Pf or PPc relations. This was despite relationships between indexes of a shift in left ventricular ejection volume to late systole and both Pf and PPc ( $p < 0.0001$ ). In contrast, adjustments for the increases in re-reflected and backward travelling wave pressures with a lower HR, eliminated HR-Pf and PPc relations.

#### Conclusion

In contrast to current thought, a lower HR is not associated with increases in PPc through an impact of increases in late systolic ejection volume on aortic reservoir volume, but rather through increases in backward wave pressures. These data suggest that increases in systemic flow, which may have beneficial effects in cardiac disease, are not responsible for increases in PPc with HR reduction. In contrast, increases in impedance to flow, which have deleterious effects in cardiac disease, are responsible for HR-associated increases in PPc.

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## Article

## Category

Population Sciences

## Abstract Title

Relative Impact of Volume-Dependent Variations in Aortic Reservoir Function Versus Pressure Wave Effects on Pulse Pressure and Cardiac Mass at a Community Level.

## English Abstract

## Introduction

Although renal mechanisms are well-recognised as contributing to primary hypertension, this has until recently, never been demonstrated to translate into sustained volume-dependent hypertension. However, recent studies indicate that in Africa, renal-related sustained volume-dependent primary hypertension is the dominant form of hypertension. The exact mechanisms through which a volume load determines increases in BP is nevertheless uncertain. We therefore aimed to identify the relative contribution of volume-dependent increases in aortic reservoir function, assessed from late systolic ejection volume, versus pressure wave (forward and backward) effects to variations in pulse pressure (PP) and LV mass index (LVMI) in a community with volume-dependent primary hypertension.

## Methods

From central pressure, aortic velocity and diameter measurements (outflow tract) and echocardiography, we determined LV ejection dynamics, arterial wave morphology and LVM in an African community (n=734).

## Results

LV end diastolic volume and circulating atrial natriuretic peptide concentrations were independently associated with both peak aortic flow (Q) and a shift in ejection volume from early (up to the first systolic shoulder, P1) (V1) to late (between P1 and peak PP) (V2) systole ( $p<0.0001$ ). Independent of the component of forward wave pressures generated by the product of Q and characteristic impedance (Zc) to flow (PQxZc) and backward wave pressures (Pb), through V2 effects, V2/V1 was independently associated with peak central arterial PP (PPc) ( $p<0.0001$ ). Relationships between V2/V1 and PPc were independent of stroke volume (SV). The impact of V2/V1 on PPc was second (standardized  $\beta$ -coefficient=0.166 $\pm$ 0.017) to max PQxZc (0.417 $\pm$ 0.030,  $p<0.001$ ) and similar to Pb (0.244 $\pm$ 0.034,  $p<0.0001$ ). Independent of PQxZc, Pb and SV, through V2 effects, V2/V1 was also independently associated with LVMI and mean wall thickness (MWT) ( $p<0.0001$ ), and in the same regression models, PQxZc ( $p<0.01$ ), but not Pb showed significant relationships with LVMI.

## Conclusion

In a community with prevalent and sustained volume-dependent primary hypertension, volume-dependent increases in reservoir function (late systolic ejection volume) contribute less than pressure waves to PP, but reservoir function is a primary determinant of LV structure. Targeting volume overload is essential in the management of volume-dependent hypertension.

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## Article

### Category

Basic Sciences

### Abstract Title

Attenuated Relationships Between Indexes of Volume Overload and Atrial Natriuretic Peptide in Uncontrolled, Sustained Volume-Dependent Primary Hypertension.

### English Abstract

#### Introduction

Although an increased blood pressure (BP) response to a Na<sup>+</sup> load is associated with an attenuated atrial natriuretic (ANP) response, Na<sup>+</sup>-sensitive hypertension is not associated with a volume overload. However, recent work provides the first evidence for a prevalent marked and sustained, volume-dependent form of primary hypertension in Africa. We aimed to determine whether systolic BP (SBP) control in sustained volume-dependent primary hypertension in Africa is associated with a blunted ANP relationship with indexes of volume load

#### Methods

Systemic hemodynamics (central pressure, echocardiographic aortic velocity and diameter measurements in the outflow tract), circulating ANP concentrations (ELISA assays) and renal function (24-hour urine collections [n=519]) were determined in a community of African ancestry (n=772).

#### Results

As compared to those with a controlled SBP, those with an uncontrolled SBP (n=198) showed lower ANP concentrations (p<0.005) despite a higher stroke volume (SV) and cardiac output (CO) (p<0.0001) and renal differences consistent with enhanced fluid retention. In those with a controlled SBP, fractional Na<sup>+</sup> excretion (p<0.0005) and creatinine clearance (p<0.005) were inversely associated with ANP concentrations independent of several confounders. Moreover, in those with a controlled SBP, SV and CO (p<0.0001) were independently and positively associated with ANP concentrations. In addition, in those with a controlled SBP, ANP concentrations were independently and inversely associated with systemic vascular resistance (SVR)(p<0.0001) and aortic characteristic impedance (Zc)(p<0.005). By contrast, in those with uncontrolled SBP, no relationships between either SV (p>0.25), CO (p>0.29) or renal function (p>0.47) and ANP concentrations were noted. Furthermore, in those with an uncontrolled SBP, no relationships between ANP concentrations and SVR or Zc were observed (p>0.34).

#### Conclusion

In a population where primary hypertension is strongly volume-dependent, in those with an uncontrolled SBP an attenuated relationship exists between ANP and both renal and hemodynamic indexes of volume overload and the vascular effects of ANP. These data suggest that agents that target increases in circulating ANP concentrations may be essential in the management of volume-dependent primary hypertension.

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## Article

### Category

Population Sciences

### Abstract Title

Impact of Thiazide-Like Diuretic Based Therapy on Increases in Systemic Blood Flow in Volume-Dependent Hypertension in Africa.

### English Abstract

#### Introduction

Although renal mechanisms are well-recognised determinants of primary hypertension, this has only recently been demonstrated to translate into persistent volume-dependent primary hypertension in some populations (African ancestry). Diuretic agents have never been demonstrated to produce persistent reductions in systemic flow, but the effect of these agents in volume-dependent primary hypertension has never been assessed. We aimed to determine the effect of the thiazide-like diuretic, indapamide on systemic flow in a population with persistent volume-dependent hypertension.

#### Methods

After a 2-week washout period in those receiving therapy, mild hypertensives of African ancestry were randomized to receive either indapamide (2.5 mg)(n=28) or amlodipine (10 mg) (n=24) daily for one month and then to receive the angiotensin-converting enzyme inhibitor, perindopril (8 mg) as add-on therapy if target office pressures had not been achieved, for a further 5 months. We assessed arterial hemodynamics from non-invasive central arterial pressure, aortic velocity and diameter measurements (outflow tract)(echocardiography) at baseline, 1 month and 6 months.

#### Results

Both groups showed decreases in systemic vascular resistance (SVR)( $p<0.05$ ) and characteristic impedance ( $Z_c$ )( $p<0.05$ ), and increases in total arterial compliance (TAC)( $p<0.05$ ) However, amlodipine-based therapy produced increases in stroke volume (SV)( $p<0.05$ ), cardiac output (CO)( $p<0.005$ ), and peak aortic flow (Q)( $p<0.05$ ), effects which were not noted in the group receiving indapamide therapy. However, indapamide failed to reduce SV, CO or Q.

#### Conclusion

In volume-dependent mild hypertension, the thiazide-like diuretic, although preventing vasodilator-associated increases in systemic flow, is unable to reduce BP through reductions in systemic flow. These data suggest that presently available diuretic agents are unable to adequately manage the volume-dependent hemodynamic component of primary hypertension in Africa.

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## Article

### Category

Clinical

### Abstract Title

Proximal Aortic Stiffness Modifies the Relationship between Heart Rate and Backward Wave and hence Central Arterial Pulse Pressure.

### English Abstract

#### Introduction

$\beta$ -adrenergic receptor blockers are required for the management of hypertension in patients with cardiac conditions. However, through a lower heart rate (HR), they increase central (PPc), but not brachial pulse pressure through enhanced backward wave pressures (Pb). Those patients most at risk of HR effects on PPc have not been identified. We aimed to determine whether these relationships are modified by increases in aortic stiffness.

#### Methods

Using non-invasive central pressure, aortic velocity and diameter measurements in the outflow tract (echocardiography), we assessed the impact of aortic stiffness on relationships between HR and arterial wave morphology in 603 community participants <60 years of age, 221  $\geq 60$  years, and in 287 participants with arterial events (stroke and critical limb ischaemia).

#### Results

As compared to community participants <60 years, those  $\geq 60$  years or with events had increased multivariate adjusted proximal aortic characteristic impedance (Zc) and carotid femoral pulse wave velocity (PWV) ( $p < 0.05$  to  $< 0.0001$ ). Community participants  $\geq 60$  years and those with events also had a greater slope of the inverse relationship between HR and Pb ( $p < 0.001$  for comparison). While in community participants <60 years, no interaction between indexes of aortic stiffness and HR occurred, in those  $\geq 60$  years ( $p < 0.02$ ) and in those with arterial events ( $p = 0.001$ ), beyond aortic root diameter, an interaction between Zc and HR, but not between PWV and HR independently associated with Pb. This translated into stepwise increases in the slope of HR-Pb relationships at incremental tertiles of Zc. Although HR was inversely associated with the systemic reflection coefficient in community participants  $\geq 60$  years ( $p < 0.0001$ ), adjustments for the reflection coefficient failed to modify HR-Pb relations.

#### Conclusion

Beyond the impact on systemic wave reflection, increases in proximal aortic stiffness enhance the adverse effects of HR on Pb and hence central BP. Approaches to minimize the effect of a lower HR on Pb and hence PPc in cardiac patients with a high aortic stiffness require identification.

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## Article

### Category

Clinical

### Abstract Title

Causes of Hypertension at a Children's Hospital in Cape Town, South Africa

### English Abstract

#### Introduction

Traditionally, hypertension in children is due to secondary causes, with renal-related diseases being the most common cause. With the onset of the obesity epidemic, primary hypertension has become increasingly more common.

The aim of this study was to determine the causes of hypertension at Red Cross War Memorial Children's Hospital (RCWMCH) and the risk factors associated with hypertension.

#### Methods

A retrospective medical record review of children < 18years old diagnosed with persistent hypertension in the paediatric nephrology unit at RCWMCH from January 2000 - December 2019. The time line was divided into 2 decades; the 1st decade from 2000 to 2009 and the 2nd decade 2010 to 2019. Patients with an acute hypertensive crisis were excluded.

#### Results

A total of 156 children were enrolled in the study, 41 children and 115 children in the first and second decades respectively. The mean age at presentation was 7years 6 months. Overall, 112 children (72%) had secondary hypertension. The frequency of primary hypertension was significantly higher ( $p=0.01$ ) in the second decade compared with the first decade, noted in 41 (35%) and 3 (8%) children respectively. Among those with primary hypertension, 20 were obese, 1 from the first decade and 19 (46%) in the second decade.

The commonest presentation at diagnosis, was stage 2 hypertension in all age groups. Of the children with secondary hypertension, the majority (54%) were in the age group 6-12 years. Glomerulopathy (24%), renovascular disease (23%) and obstructive uropathy (9%) were the commonest causes of secondary hypertension. Hereditary cystic disease (36%) was the commonest cause of hypertension in children <1 year of age.

The most commonly used anti-hypertensive agents were amlodipine (79%) followed by enalapril (39%) then furosemide (25%)

#### Conclusion

There was a 3-fold increase in the number of children referred to our renal clinic over the last 2 decades. The number of children with primary hypertension increased exponentially in the last decade and a larger percentage of these children are obese. Secondary hypertension still remains more common. The causes of hypertension in our setting, were similar when compared internationally, except in infants.

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## Article

### Category

Clinical

### Abstract Title

Marked Increases in Proximal Aortic Characteristic Impedance and hence Forward Wave Pressures Beyond Brachial Blood Pressure in Patients with Angiographic Proven Coronary Artery Disease

### English Abstract

#### Introduction

Although indexes of aortic stiffness increase the risk for coronary artery disease (CAD), the extent to which increases in proximal aortic stiffness enhance central arterial forward wave pressures beyond changes in peripheral pressures, is uncertain. We aimed to determine whether increases in proximal aortic stiffness, as indexed by aortic characteristic impedance (Zc) translate into an enhanced central arterial pressure for a given brachial BP.

#### Methods

From central pressure, aortic velocity and diameter measurements (outflow tract) and echocardiography, we determined Zc and arterial pressure wave morphology in 71 patients with angiographic proven CAD and with all other cardiac pathology excluded. We compared central arterial function in these patients with 230 age and sex-matched controls from a community study, and in patients with stroke and CLI (n=287) diagnosed in a hospital setting.

#### Results

With adjustments for confounders, including mean arterial pressure, and aortic root diameter, as compared to age- and sex-matched controls, both Zc and the pressures generated by the product of peak aortic flow (Q) and Zc (PQxZc) were markedly increased in patients with CAD ( $p<0.0001$ ) and those with stroke or CLI ( $p<0.005$ ). Moreover, as compared to patients with stroke and CLI, those with CAD also had marked increases in both Zc and PQxZc ( $p<0.0001$ ). As a consequence, with adjustments for the same confounders, the pressures generated by forward wave pressures (Pf) were markedly increased in patients with CAD as compared to controls and to patients with alternative arterial diseases ( $p<0.0001$ ). Importantly, after further adjustments for brachial PP or SBP, the higher Pf values in patients with CAD were retained ( $p<0.005$  to  $<0.0001$ ). In contrast, with adjustments for brachial SBP and confounders, central aortic PP did not differ between groups.

#### Conclusion

Independent of confounders and aortic root diameter, a marked increase in proximal aortic Zc occurs in patients with CAD as compared to both age and sex-matched controls and patients with arterial disease in alternative beds. This translates into a strikingly greater central arterial pulsatile load determined by forward travelling pressure waves, but not peak central PP than that predicted by brachial BP measurements. These data support a need for intense brachial BP lowering in CAD.

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## Article

### Category

Clinical

### Abstract Title

Hypertension perspectives and health behaviours among African youth: the impact of health education and employment.

### English Abstract

#### Introduction

In South Africa between 1998 and 2016, hypertension rates in young adults (15-34 years) more than doubled calling for preventive interventions. However, with many youths not in employment, education, or training (NEET), young adults struggle to prioritize health or implement healthy behaviours. It is not clear if changing a NEET status changes behavioural intentions.

This study aimed to explore young adults' intention to change behaviour by comparing hypertension-related risk perceptions and beliefs between NEET (n=20) and previously NEET youth (n=20) on a health education training initiative (HETI).

#### Methods

A cross-sectional study was performed. Data were collected through six focus group discussions from August to October 2021, utilising the Health Belief Model (HBM) as the conceptual framework.

#### Results

While all youth viewed hypertension as life threatening leading to cardiovascular disease or death, especially if left untreated, only youth undertaking health education felt empowered to implement healthy behaviours for disease prevention. These youth reported BP self-checks and the practical application of their knowledge as motivating factors for preventive behaviour, making it personally important for them. In contrast, NEET youth felt hypertension was inevitable and described negative experiences at clinics and fear of being diagnosed with hypertension as reasons not to be screened. The fear of lifelong medication use was expressed by all youth.

#### Conclusion

Our results suggest that personal relevance is key for youth to engage in preventive health behaviour for chronic diseases. Health education programmes with practical self-testing may be useful to aid to such efforts.

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## Article

### Category

Population Sciences

### Abstract Title

Independent Relationship between Circulating Atrial Natriuretic Peptide Concentrations and Endothelial Function in a Population with Age-Related Systemic Volume Overload.

### English Abstract

#### Introduction

Preclinical evidence suggests that atrial natriuretic peptide (ANP) improves endothelial function through direct effects, but clinical evidence is lacking. We assessed if ANP concentrations in a population with a striking age-related volume overload, and volume-dependent hypertension, are independently associated with endothelial function.

#### Methods

Systemic hemodynamics (echocardiography and central arterial pressure), circulating concentrations of ANP and biomarkers of endothelial function (ELISA) were determined in 601 participants from a population with marked age and renal-related increases in systemic flow.

#### Results

ANP was independently associated with stroke volume (SV) and cardiac output (CO) derived from both left ventricular outflow tract and dimension measurements ( $p < 0.0001$ ). Beyond blood pressure and additional confounders, ANP, but not systemic flow was independently and inversely associated with asymmetric dimethyl arginine (ADMA) ( $p < 0.0005$ ), but not V-CAM, I-CAM or E-selectin ( $p > 0.24$ ). An interaction between SV and ANP was associated with ADMA ( $p < 0.05$ ), with strong ANP-ADMA relationships noted in those with the highest ( $p < 0.0005$ ), but not the lowest ( $p = 0.11$ ) tertile of SV. Although ANP was independently and inversely associated with systemic vascular resistance (SVR) ( $p < 0.001$ ) and aortic characteristic impedance ( $Z_c$ ) ( $p < 0.01$ ), neither SVR,  $Z_c$ , nor interactions between ANP and resistance were independently associated with ADMA or alternative indexes of endothelial function. Although ANP was also independently associated with adiponectin ( $p < 0.005$ ), but not pro-inflammatory cytokine concentrations, neither adiponectin, diabetes mellitus, nor insulin resistance (homeostasis model) explained relationships between ANP and ADMA.

#### Conclusion

At a population level, independent of metabolic or hemodynamic effects, circulating ANP is independently associated with an improved endothelial function, as indexed by ADMA. Agents that target increases in ANP concentrations in the management of volume-dependent primary hypertension, such as is frequently noted in Africa, may produce cardiovascular benefits beyond BP control.

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## Article

### Category

Basic Sciences

### Abstract Title

Independent Relationship Between Volume Overload and Aortic Stiffness in a Community with Prevalent Volume-Dependent Primary Hypertension

### English Abstract

#### Introduction

Although renal mechanisms are well-established causes of hypertension, this has only recently been recognized as causing sustained volume-dependent, primary hypertension. This observation was documented in the SOWETO community. Although no current antihypertensive agent can produce sustained volume reduction, targeting pressures has generally been accepted as sufficient therapy. However, whether volume overload causes cardiovascular damage beyond pressure effects is uncertain.

#### Methods

In 734 participants of African descent randomly selected from SOWETO, we aimed to determine whether volume effects in primary hypertension cause vascular damage beyond BP. Haemodynamics were determined from central pressure, aortic velocity and diameter measurements (outflow tract)(echocardiography) and arterial structure and function from several end-organ measures.

#### Results

Independent of age, sex, conventional risk factors and both mean arterial pressure and central arterial pulse pressure or systolic BP, several indices of volume overload were associated with aortic pulse wave velocity (PWV) and index of aortic stiffness. These included aortic stroke volume (SV) ( $p<0.0001$ ), peak aortic flow ( $p<0.0001$ ), the volume ejected from the left ventricle in late systole ( $p<0.0001$ ), and left ventricular end diastolic volume ( $p<0.001$ ). These associations were explained by an increase in aortic diameter ( $p<0.0001$ ) which increases aortic wall stress. Independent of confounders, SV was also independently associated with markers of endothelial function including V-CAM-1 and I-CAM1 ( $p<0.05$ ). However, no independent relations were noted between indices of volume overload and carotid intima-media thickness.

#### Conclusion

Independent of confounders, and BP load, volume overload in sustained volume-dependent primary hypertension, is strongly associated with aortic stiffness. These effects may be explained by increases in wall stress and consequently endothelial dysfunction. These data indicate that beyond BP changes, reductions in volume overload in volume-dependent primary hypertension are essential for risk reduction.

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## Article

### Category

Basic Sciences

### Abstract Title

Associations between kidney function and the soluble (pro)renin receptor in young adults: The African-PREDICT study

### English Abstract

#### Introduction

The soluble (pro)renin receptor [s(P)RR], a receptor for both prorenin and renin is associated with kidney dysfunction, possibly due to its proinflammatory and profibrotic effects. s(P)RR is elevated in individuals with hypertension, type 2 diabetes, preeclampsia and chronic kidney disease, with evidence of ethnicity- and sex-specific differences. Despite being known as part of the renin-angiotensin system (RAS) for the past two decades, studies on the role of s(P)RR in kidney function remain scant, particularly in young healthy populations. The aim of the current study was to compare s(P)RR and markers of kidney function between black and white participants grouped according to sex and investigate associations of estimated glomerular filtration rate (eGFR), urinary albumin-creatinine ratio (uACR) and alpha 1-microglobulin (A1M) with s(P)RR in young black and white men and women.

#### Methods

We included apparently healthy black (men, N=283; women, N=301) white (men, N=297; women, N=310) participants aged 20-30 years. Participants were normotensive at screening (clinic blood pressure <140/90 mmHg). We recorded 24-hour blood pressure and measured albumin and creatinine in urine and calculated uACR. Creatinine, s(P)RR and A1M were measured in serum and eGFR was calculated.

#### Results

eGFR was higher in both black men and women as compared to white men and women, while uACR was higher in black men compared to white men (all  $P \leq 0.006$ ). A1M was higher in white women compared to black women ( $P=0.001$ ). s(P)RR was higher in both white men and women as compared to their black counterparts (both  $P \leq 0.001$ ). After multiple adjustments for covariates, an independent positive association was observed between A1M and s(P)RR in white women only (Adjusted R-squared=0.130;  $\beta=0.195$ ;  $P=0.007$ ). There were no associations of eGFR and uACR with s(P)RR in any of the groups.

#### Conclusion

We found higher s(P)RR levels in young healthy white men and women as compared to their black counterparts. In this group of white women, s(P)RR associated positively with A1M, a marker of kidney function known to be upregulated by oxidative stress, and not with conventional markers of kidney function. Our results suggest that s(P)RR activation may contribute to kidney damage through inflammation and oxidative stress in young white women.

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## Article

### Category

Population Sciences

### Abstract Title

Influence of Diabetes Mellitus on Early and Late Outcome After Percutaneous Transluminal Coronary Angioplasty

### English Abstract

#### Background

Although patients with diabetes mellitus constitute an important segment of the population undergoing coronary angioplasty, the outcome of these patients has not been well characterized.

#### Methods

Data for 1133 diabetic and 9300 nondiabetic patients undergoing elective angioplasty from 1980 to 1990 were analyzed.

#### Results

Diabetics were older and had more cardiovascular comorbidity. Insulin-requiring (IR) diabetics had diabetes for a longer duration and worse renal and ventricular functions compared with non-IR subjects. Angiographic and clinical successes after angioplasty were high and similar in diabetics and nondiabetics. In-hospital major complications were infrequent (3%), with a trend toward higher death or myocardial infarction in IR diabetics. Five-year survival (89% versus 93%) and freedom from infarction (81% versus 89%) were lower, and bypass surgery and additional angioplasty were required more often in diabetics. In diabetics, only 36% survived free of infarction or additional revascularization compared with 53% of nondiabetics, with a marked attrition in the first year after angioplasty, when restenosis is most common. Multivariate correlates of decreased 5-year survival were older age, reduced ejection fraction, history of heart failure, multivessel disease, and diabetes. IR diabetics had worse long-term survival and infarction-free survival than non-IR diabetics.

#### Conclusion

Coronary angioplasty in diabetics is associated with high success and low complication rates. Although long-term survival is acceptable, diabetics have a higher rate of infarction and a greater need for additional revascularization procedures, probably because of early restenosis and late progression of coronary disease. The most appropriate treatment for these patients remains to be determined.

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## Article

### Category

Population Sciences

### Abstract Title

Comparison of cardiovascular health profiles across population surveys from five high- to low-income countries

### English Abstract

#### Introduction

Cardiovascular diseases (CVD) remain the leading cause of global mortality and morbidity, with nearly 80% of global CVD related deaths occur in low- and middle-income countries (LMICs). In 2010, the American Heart Association (AHA) expanded the focus of addressing existing CVD risk factors, to rather focus on strategies that would directly promote cardiovascular health (CVH) of individuals. Ideal CVH were based on 7 health behaviours and factors that, when optimal, were associated with greater CVD-free survival and higher quality of life. The 7 CVH components, better known as Life's Simple 7, included dietary quality, physical activity, cigarette smoking, body mass index (BMI), fasting blood glucose, total cholesterol, and blood pressure (BP) measurements. Each metric was defined as either poor, intermediate or ideal, with ideal CVH having all 7 metrics at an ideal level.

Previous studies showed that ideal CVH strongly associated with lower risk of CVD and all-cause mortality in young, middle-aged, and older adults. The prevalence of ideal CVH in adults is generally quite low worldwide, although most studies come from high-income countries. Moreover, how the prevalence of CVH and its pattern during adulthood varies across high and LMICs have not yet been explored. Understanding similarities and specificities of different countries might help tailor public policies to encourage better CVH. Nationally representative surveys from countries with distinct characteristics are a good opportunity for exploiting the gaps described. As such, harmonisation of individual-level data from these surveys is a challenge to be addressed. The harmonisation would also permit the study of variables that may be potential determinants of achieving ideal CVH in adulthood across and within countries. We aimed to 1) compare prevalence of ideal CVH across five high- to low-income countries using nationally representative surveys, (2) to compare country CVH trends during adulthood, and (3) to identify the factors that may be associated with CVH prevalence and trends across these five countries. To address these aims we harmonised cross-sectional data from the World Health Organisation (WHO) STEPwise approach to surveillance (STEPS) program, (Bangladesh and Ethiopia), the United States (US) National Health and Nutrition Examination Surveys (NHANES), Health Survey for England (HSE) and the National Health Survey for Brazil (PNS-Brazil).

#### Methods

We compared CVH variables from five nationally representative population surveys (aged 18 - 65 plus years) from STEPS Bangladesh (2018), STEPS Ethiopia (2015), NHANES (pre-pandemic data; 2017-2020), HSE (2016) and Brazil-PNS (2013). Surveys were examined for primarily of the 8 CVH metrics (healthy sleep, diet, physical activity, cigarette smoking, BMI, fasting blood glucose, total cholesterol, and BP measurements). To investigate whether harmonisation of each variable across the countries were possible, we defined each variable according to the AHA guidelines as either ideal, intermediate, or poor health. Each variable was converted to a CVH score using cut-points based on the AHA criteria. The scores ranged from ideal (2 points), intermediate (1 point), or poor (0 point) CVH. Participant characteristics was described by country with continuous variables reported as means and standard deviation, or median and interquartile range as appropriate. The CVH metrics patterns in each country and across country was examined. We performed weighted analysis to retain representativeness of the survey data. The CVH score was examined over age per country. Weighted prevalence of each CVH metric category was reported. The prevalence of CVH was described across and within the countries. Age-sex adjusted prevalence of ideal CVH was determined within and across surveys. Logistic regression was used to assess the association between ideal CVH, and participant characteristics adjusted for relevant variables. In June 2022, the AHA updated the guidelines for CVH from Life's Simple 7 to Life's Essential 8, which included healthy sleep and introduced a new point system for the 8 metrics. Although the AHA has updated the guidelines and point system for CVH metrics, this secondary data analysis used the previous guidelines and point-system for Life's Simple 7.



Submission ID: 1397 *continued*

### Results

The number of participants included in this secondary data analysis are as follow: Bangladesh – n=8144 (18-69 years, 50.9% male); Ethiopia – n=8010 (18-69 years, 55.6% male); US – n=10220 (18-80 years, 48.5% male); England – n=4847 (18-90 years, 47.9% male), and Brazil – n=8856 (18-104 years, 47.5 % male). The weighted prevalence of hypertension was 19% in Ethiopia, in comparison to 36% in the US, with other LMICs presenting between these two countries. Further presentation of other CVH metrics will be given at the congress.

### Conclusion

The prevalence of hypertension in LMICs is growing fast and intensive efforts are urgently needed to combat this emerging hypertension burden. Shifting the focus globally from disease detection to the promotion and maintenance of ideal cardiovascular health across the life course would support such efforts and relieve stress on already overburdened LMIC healthcare systems. Global guidelines for the collection, interpretation and harmonisation of the cardiovascular health metrics required to monitor ideal CVH support this move.

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## Article

### Category

Clinical

### Abstract Title

Assessment of left ventricular systolic and diastolic function in patients with asymptomatic Type 2 diabetes

### English Abstract

#### Introduction

The prevalence of type 2 diabetes mellitus (T2DM) has more than doubled since the 1980s. Diabetes increases the risk of new heart failure (HF) by a factor of 2-5 in a Framingham study. The left ventricular (LV) dysfunction associated with diabetes is multifactorial, however, myocardial damage resulting from chronic metabolic disturbances and systemic inflammation is a major contributor to the progressive development of cardiomyopathy until symptoms appear. Screening for heart failure in patients at risk can detect the condition and predict outcomes. Thus, we sought to understand the associations between impaired left ventricular systolic-diastolic function in patients with T2DM.

#### Methods

A total of 108 patients with at least one risk factor for HF (hypertension, obesity or T2DM) were recruited from two community populations and divided into two groups: T2DM (n = 68, age  $61 \pm 8$  years) and non-T2DM (n = 40, age  $62 \pm 10$  years). Treatment combinations with metformin were assessed in the T2DM group. Full echocardiography was performed in all patients including global longitudinal strain (GLS) and diastolic function (transmitral flow [E], annular velocity [e']) at baseline and at follow-up (median 5 months).

#### Results

A reduction in GLS was observed in the T2DM group (baseline  $-16.5 \pm 2.5\%$  versus follow-up  $-16 \pm 2.3\%$ ;  $p = 0.003$ ), but not in the non-T2DM group ( $-18 \pm 2.5\%$  versus  $-17.6 \pm 2.4\%$ ;  $p = 0.01$ ). Estimated left ventricular filling pressures increased in both the T2DM group ( $p = 0.001$ ) and the non-T2DM group ( $p = 0.01$ ).

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## Article

### Category

Clinical

### Abstract Title

Deprescribing to Improve Polypharmacy

### English Abstract

#### Introduction

The concurrent use of multiple medications (Polypharmacy) has been shown to increase admissions to the hospital, and mortality due to interactions. Several components contribute to polypharmacy e.g. multiple prescriptions from different prescribers, as well as self-medication. This results in duplication of therapy, drug-drug interactions and disease-drug interactions.

Aims of the study are to Improve Patient Safety, Improve Compliance, Minimise Pharmaceutical Wastage and to Develop Strategies to Improve Polypharmacy.

#### Methods

Study Design. This was an observational study at a public hospital. Medscape's Interaction checker was used to verify interactions.

Study population. Patients on chronic medication serviced by the hospital.

Sample Size. 250 prescriptions were randomly selected over 3 years.

#### Results

The following drug interactions were observed:

- Amitriptyline and Indapamide: both increase QTc interval. This may increase risk of sudden death in elderly population.
- Perindopril and Allopurinol: There is a high risk of developing an anaphylaxis and Stevens Johnson Syndrome.
- Perindopril and Pregabalin: Co-administration results in additive risk of developing angioedema of the face, neck and mouth.

#### Conclusion

The study found numerous drug-drug interactions, disease-drug interactions and unused medicines returns. Periodic review of prescriptions with an intent to de-prescribe is recommended.

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## Article

## Category

Population Sciences

## Abstract Title

Kidney dysfunction: prevalence and associated risk factors in a community-based study from the North West Province of South Africa

## English Abstract

## Introduction

Chronic kidney disease (CKD) is in the top 10 leading causes of mortality globally. In South Africa where non-communicable diseases are the main cause of mortality the true prevalence of CKD is unknown, and its associated risk factors remain understudied in the general population. In this study we investigate the prevalence and identify the main risk factors involved in kidney dysfunction that will be helpful in guiding health care professionals in the planning of intervention studies.

## Methods

This cross-sectional study included 1999 participants older than 30 years. Kidney dysfunction was defined as (i) estimated glomerular filtration rate (eGFR)  $<90$  ml/min/1.73m<sup>2</sup>, or (ii) urine albuminuria-to-creatinine ration (uACR)  $\geq 3.0$  mg/mmol, or a combination (i and ii). The risk factors included are age, sex, locality, body mass index (BMI), blood pressure (BP), Lipids, hemoglobin A1c (HbA1C), C-reactive protein (CRP), gamma-glutamyl transferase (GGT), tobacco use and human immunodeficiency virus (HIV).

## Results

The mean age of all participants was 48.0 (42.0;56.0) years, and 656/1999 (33%) had kidney dysfunction. Those with kidney dysfunction were older, majority women, had higher measures of adiposity, systolic, diastolic, and mean arterial BP, higher lipids as well as higher CRP (all  $p < 0.024$ ). In multiple regression analyses, eGFR was associated with systolic BP ( $\beta = 0.11$ ) and HIV ( $\beta = -0.09$ ), while albuminuria was associated with elevated CRP ( $\beta = 0.12$ ) and HIV infection ( $\beta = 0.11$ ) (all  $p < 0.026$ ). In both groups (individuals with and without kidney dysfunction) eGFR associated with age ( $\beta = -0.29$ ,  $\beta = -0.49$ , respectively), male sex ( $\beta = 0.35$ ,  $\beta = 0.28$ , respectively), body mass index (BMI) ( $\beta = -0.12$ ,  $\beta = -0.09$ , respectively), low density lipoprotein cholesterol/ high density lipoprotein cholesterol ratio ( $\beta = -0.17$ ,  $\beta = -0.09$ , respectively) and CRP ( $\beta = 0.10$ ,  $\beta = 0.09$ , respectively) (all  $p < 0.005$ ); while uACR associated with female sex ( $\beta = 0.10$ ,  $\beta = -0.14$ , respectively), urban locality ( $\beta = -0.11$ ,  $\beta = -0.08$ , respectively), BMI ( $\beta = -0.11$ ,  $\beta = -0.11$ , respectively), and systolic BP ( $\beta = 0.27$ ,  $\beta = 0.14$ ) (all  $p < 0.017$ ).

## Conclusion

In this relatively young population kidney dysfunction prevalence is high. When compared to individuals without kidney dysfunction intervention strategies should be focused on controlling blood pressure, inflammation, and HIV.

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Clinical

**Abstract Title**

The Value of Admission HbA1c in patients with Acute Myocardial Infarction

**English Abstract****Introduction**

Diabetes mellitus (DM) and coronary artery disease (CAD) are associated with significant morbidity and mortality. The rising incidence of these non-communicable conditions and the subsequent complications, especially in developing nations, has highlighted the need for improved treatment strategies. This retrospective observational study investigated the role of admission glycated hemoglobin A1c (HbA1c) and its relation to major adverse cardiovascular events (MACE) in patients with acute myocardial infarction (AMI) during hospitalization and six months' follow-up.

**Methods**

The study cohort included 1000 patients with AMI who had been admitted to the coronary care unit (CCU) of RK Khan Hospital, Durban, South Africa from December 2016 to March 2018. The demographic, clinical and biochemical data for these patients were obtained from an electronic database and divided into three categories according to HbA1c levels: low (<5.7), medium (5.7-6.4) and high (≥6.5).

**Results**

The mean age of the study population was 56.7 with majority (71.6%) being males. Diabetic patients comprised 74.9% of the study cohort, 17.7% of whom were newly diagnosed based on HbA1c levels. There were 26.8% of patients that experienced MACE with cardiac failure occurring most frequently (12.6%;  $p=0.03$ ). Greatest incidence of MACE was observed in the group with lowest HbA1c (33.1%;  $p=0.051$ ). Although multivariable logistic regression analyses showed diabetes mellitus, hyperuricemia and family history of CAD to be significantly associated with MACE, no correlation was noted between HbA1c values and MACE.

**Conclusion**

This study shows that diabetes mellitus is the most common risk factor for AMI. Admission HbA1c is of value in detecting undiagnosed diabetes and excluding stress hyperglycemia as a cause of elevated admission glucose levels. Patients with low HbA1c had the highest incidence of MACE with cardiac failure occurring most frequently. This highlights the negative effects of hypoglycemia and the need to prevent it. However, this study shows that admission HbA1c is not predictive of in hospital and short-term MACE in AMI patients and further research is required in this area.

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## Article

### Category

Basic Sciences

### Abstract Title

A comparison of retinal vessel functional responses between people living with HIV and HIV-free South Africans: Findings from the EndoAfrica-NWU study

### English Abstract

#### Introduction

The effect of HIV and antiretroviral therapy (ART) on microvascular function is poorly explored. Data suggests that HIV can adversely influence microvascular function through endothelial cell apoptosis and neurovascular unit impairment. The retinal microvasculature offers the opportunity to non-invasively assess early changes in microvascular function, which may precede cardiovascular disease development. Thus, we compared retinal vessel functional responses to flicker light-induced provocation (FLIP) between treated people living with HIV (PLWH) and HIV-free participants, considering the influence of HIV-related characteristics on microvascular function.

#### Methods

This case-control study included 114 PLWH (all receiving the same first-line ART regimen) and 51 HIV-free South Africans from the North-West province (aged 18-60 years). Characteristics and retinal arteriolar and venular functional responses (dilation and constriction/minimum reaction parameters) to FLIP were compared between a) PLWH and HIV-free participants; and b) PLWH-groups that were stratified by the median of (i) CD4-count (515.50 cells/ $\mu$ L), (ii) viral load (50 copies/mL), and (iii) ART duration (59.2 months).

#### Results

PLWH were older ( $41.8 \pm 8.6$  years), smoked more (60.2%) and had a lower hypertensive prevalence (31.6%) than the HIV-free controls ( $p < 0.05$ ), but the sex distribution was similar. Almost half of PLWH were infected for more than five years. Retinal vessel parameters were similar between PLWH and HIV-free participants, even after adjusting for age, smoking and hypertensive status. The retinal vessel functional responses did not differ between the CD4-count, viral load, and ART duration groups.

#### Conclusion

Living with HIV and receiving ART did not contribute to altered microvascular function in the current study population.

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## Article

## Category

Population Sciences

## Abstract Title

Selenium and cardiovascular protection in young adults: The African-PREDICT study

## English Abstract

## Introduction

Early onset hypertension has been linked with changes in cardiovascular structure and function, whereas antioxidant intake may have beneficial effects against cardiovascular disease. Therefore, we aimed to determine the associations of left ventricular mass index (LVMI), relative wall thickness (RWT) and systemic vascular resistance (SVR) with selenium (an essential micronutrient with antioxidant properties) in young adults stratified as normotensive or masked hypertensive.

## Methods

In 1126 young adults, aged 20-30 years, we determined echocardiographic measurements including LVMI and RWT, calculated SVR and performed biochemical analyses to determine serum selenium levels by inductively coupled plasma mass spectrometry.

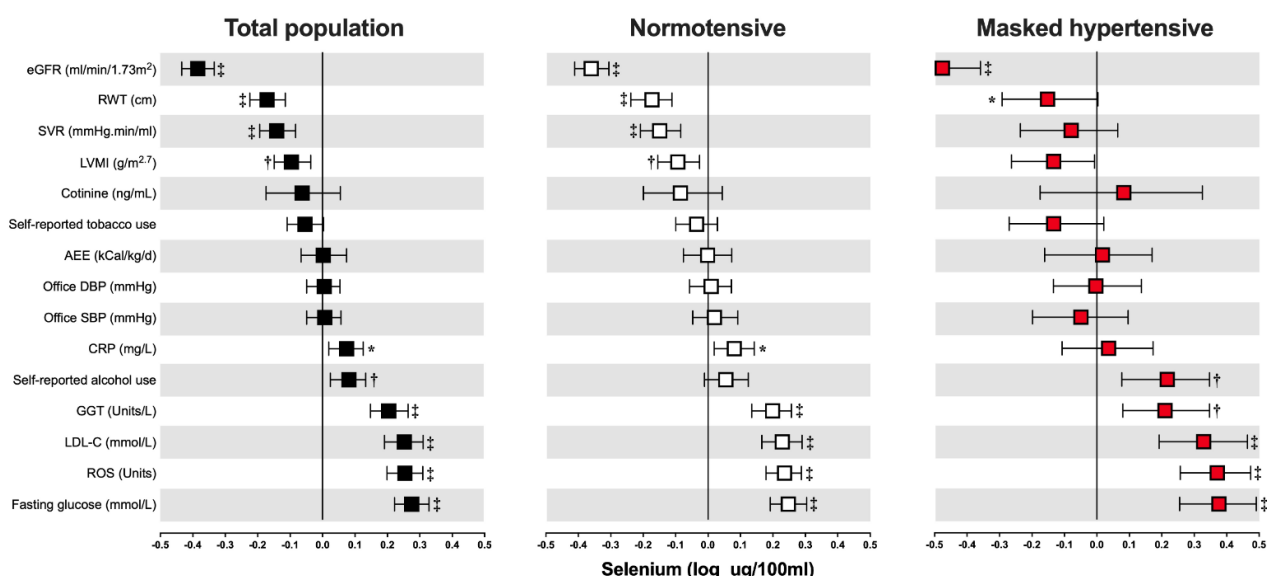
## Results

The study population had a mean age of 24.6 years with a normal mean selenium level of 13.3 µg/100ml serum with no significant difference (all  $p \geq 0.57$ ) between normotensive ( $n=928$ ) and masked hypertensive ( $n=198$ ) participants. In backward stepwise multivariable adjusted regression analysis, a beneficial relationship of LVMI (adj.  $R^2=0.19$ ;  $\beta=-0.091$ ;  $P=0.004$ ), RWT (adj.  $R^2=0.096$ ;  $\beta=-0.18$ ;  $P<0.001$ ) and SVR (adj.  $R^2=0.24$ ;  $\beta=-0.12$ ;  $P<0.001$ ) with selenium was observed in normotensive but not in masked hypertensive participants.

## Conclusion

Independent inverse associations of LVMI, RWT and SVR with selenium, in young, normotensive adults suggest that sufficient selenium levels may protect against the early development of left ventricular remodelling and increased vascular resistance, however this cardioprotective role of selenium is attenuated in the setting of masked hypertension.

Upload your slides or pictures illustrating the case



Submission ID: 1348 *continued*

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## Article

### Category

Population Sciences

### Abstract Title

Association between central blood pressure and arterial stiffness and low cognitive scores in South African adults

### English Abstract

#### Background

Even though there are higher levels of hypertension among South African adults, a chronic condition that is associated with early vascular aging and cognitive impairment, there is a paucity of studies that investigate this relationship.

#### Aims

To determine the association between blood pressure, arterial stiffness, and cognitive function in younger (29 yrs) and older adults (>47 yrs) from an urban South African cohort study.

#### Methods

A complete cross-sectional case study of  $n = 93$  young adults (index children) and their mothers from the Birth-to-Twenty Plus cohort was conducted. Peripheral and central blood pressure (BP) measurements were collected, mean arterial pressure (MAP) was calculated and an augmentation index was derived. Carotid-femoral pulse wave velocity (cfPWV), which reflects local arterial stiffness and has a direct impact on cerebral circulation was measured with applanation tonometry. Cognitive assessments were conducted using the Montreal Cognitive Assessment (MoCA) instrument were conducted to get a total test score and various domain-specific scores. Multiple logistic regressions to determine the association between the BP variables, global cognitive, and specific domains test scores were conducted.

#### Results

Forty percent of the sample had low MoCA total scores, and 32% of the total sample had hypertension [BP  $\geq 140/90$  mmHg (brachial)]. Significant differences between means of central pulse pressure, augmentation pressure, and cfPWV for the low and normal visual perception MoCA domain test scores were observed ( $p < 0.05$ ). Only cfPWV mean difference was observed for the low and normal verbal fluency MoCA domain. No associations were found between BP measurements and total MoCA scores ( $p < 0.01$ ). Also, no associations were found between peripheral and central BP variables with individual MoCA domains when stratified by age. A significant relationship was found between mean pressure (OR 1.47 95% CI [1.07-2.07]) and one MoCA domain (low visual perception).

#### Conclusion

Central mean pressure is associated with low visual perception MoCA domain among black women. These findings add to the growing evidence which suggests that central BP variables are important to explore as exposure proxies for studying the association between BP measurements and cognitive dysfunction, especially among younger and older adults.

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## Article

### Category

Clinical

### Abstract Title

Determinants of functional capacity in patients with chronic heart failure: Role of filling pressure and systolic and diastolic function

### English Abstract

#### Introduction

Previous work suggesting a better correlation of diastolic than systolic function with exercise capacity in heart failure may reflect the relative insensitivity and load-dependence of ejection fraction (EF). We sought the correlation of new and more sensitive methods of quantifying systolic and diastolic function and filling pressure with functional capacity.

#### Methods

We studied 155 consecutive exercise tests on 95 patients with congestive heart failure (81 male, aged  $62 \pm 10$  years), who underwent resting 2-dimensional echocardiography and tissue Doppler imaging before and after measurement of maximum oxygen uptake (peak VO<sub>2</sub>).

#### Results

The resting EF was  $31\% \pm 10\%$  and a peak VO<sub>2</sub> was  $13 \pm 5$  mL/kg•min; the majority of these patients (80%) had an ischemic cardiomyopathy. Resting EF ( $r = 0.14$ ,  $P = .09$ ) correlated poorly with peak VO<sub>2</sub> and mean systolic ( $r = 0.23$ ,  $P = .004$ ) and diastolic tissue velocities ( $r = 0.18$ ,  $P = .02$ ). Peak EF was weakly correlated with the mean systolic ( $r = 0.18$ ,  $P = .02$ ) and diastolic velocities ( $r = 0.16$ ,  $P < .04$ ). The mean sum of systolic and diastolic velocities in both annuli ( $r = 0.30$ ,  $P < .001$ ) and E/Ea ratio ( $r = -0.31$ ,  $P < .001$ ) were better correlated with peak VO<sub>2</sub>. Prediction of peak VO<sub>2</sub> was similar with models based on models of filling pressure ( $R = 0.61$ ), systolic factors ( $R = 0.63$ ), and diastolic factors ( $R = 0.59$ ), although a composite model of filling pressure, systolic and diastolic function was a superior predictor of peak VO<sub>2</sub> ( $R = 0.69$ ; all  $P < .001$ ).

#### Conclusion

The reported association of diastolic rather than systolic function with functional capacity may have reflected the limitations of EF. Functional capacity appears related not only to diastolic function, but also to systolic function and filling pressure, and is most closely associated with a combination of these factors.

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## Article

### Category

Clinical

### Abstract Title

Intracardiac stenosing mass of the Mitral Valve: a case report.

### English Abstract

#### Introduction

Cardiac tumours are intracardiac masses that are rarely encountered compared to pseudo-tumours. They are subdivided into secondary tumours, the most frequent, and primary tumours representing 5%. The latter are made up of 10% malignant tumours and 90% benign tumours, of which myxoma is the leader. Its size and in particular its location on the mitral tract is rare, in the order of 1-5%, associated with severe symptoms and a huge complication.

#### Methods

This was a 65-year-old diabetic patient who presented with worsening dyspnoea in whom a transthoracic echocardiography completed by a transesophageal echocardiography, a cardiac MRI, a cerebro-thoracoabdominopelvic PET-scan showed a cauliflower-like mass embedded on the small mitral valve, evoking the diagnosis of myxoma, confirmed by anatomopathological examination. A lumpectomy with mitral valve plasty was performed in association with coronary bypass surgery for a trituncal lesion. The evolution was marked by an improvement of the clinical and echographic state.

#### Results

Myxoma is the first benign tumour encountered in women between the 3rd and 6th decade, the diagnosis of which is evoked by a TTE, better by a TEE or more, by a CT or even a cardiac MRI which specify the visualization of the soft tissues with all the internal details of the myxoma, the confirmation of which is carried out on the histopathological analysis of the operative part.

#### Conclusion

The management is based on resection of the tumour completed by a mitral valve plasty. Early mortality is less than 5%, and in-hospital mortality is zero. The risk of recurrence is 1-4% in sporadic myxomas.

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## Article

### Category

Clinical

### Abstract Title

Longitudinal global strain as a prognostic element in moderately reduced ejection fraction heart failure

### English Abstract

#### Introduction

Global Longitudinal Strain (GLS) is a new and sensitive ultrasound indicator of left ventricular (LV) systolic function. It can not only assess the evolution of LV systolic function if it is impaired, but also predict the risk of future events in this population. Thus, what is its place in the prognosis of moderately reduced ejection fraction heart failure (mrVEF).

#### Methods

This is a prospective study of 6 months of HF patients with LVEF (40%-50%). LMS was assessed by two-dimensional speckle-tracking software on echocardiography. We recorded any cardiovascular events requiring or not requiring hospitalization and reported on LMS and LVEF.

#### Results

Among the 102 patients with HFimpEF, the median absolute values of SGL and LVEF were 14.1% (12.5%-16.7%) and 44% (40%-50%) respectively. In the 6 months following the baseline echocardiogram any 1% increase in SGL on echocardiography was associated with a lower probability of the composite endpoint of: heart failure in 73%; atrial fibrillation in 25%; intra left ventricular thrombus in 2%.

#### Conclusion

In patients with HFimpEF, GLS is an important predictor of cardiovascular events.

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## Article

### Category

Population Sciences

### Abstract Title

Hemoglobinopathies and dilated cardiomyopathy at the CHU Ibn Rochd-Casablanca

### English Abstract

#### Introduction

Cardiovascular complications of hemoglobinopathies are more and more common, including rhythm and conduction disorders, heart failure (HF), vascular disease and pulmonary hypertension. They constitute a prognostic factor. Study the association between hemoglobinopathies and dilated cardiomyopathy.

#### Methods

Prospective cross-sectional study conducted between May and October 2018, including patients >14 years old, with sickle cell disease and/or thalassemia followed in the adult and pediatric hematology department at Ibn Rochd University Hospital-Casablanca-Morocco. All patients had a complete clinical examination with an electrocardiogram and a cardiac ultrasound.

#### Results

52 patients were included, the average age was 24,19 ( $\pm 9,55$ ) years. Females accounted for 49.1% of patients. 30.2% of patients had homozygous thalassemia, 24.5% had heterozygous thalassemia, 22.6% had homozygous sickle cell disease, 17% had heterozygous sickle cell disease, and 5.7% had sickle cell disease and thalassemia. Echocardiographic analysis revealed dilated LV in 27,5% of cases. The mean value of tele-diastolic-diameter of LV was 50,04 ( $\pm 6,94$ )mm, homozygous sickle cell patients had significantly a ( $57 \pm 7,63$ mm) and heterozygous sickle cell patients had a larger diameter compared to the other groups ( $51,25 \pm 5,50$ mm)  $p=0,008$ . The mean LVEF was 59.64% ( $\pm 4,09$ ) and was impaired in one case with a LVEF of 48%. Mean LGS was -21.23% ( $\pm 3,19$ ). SGL was impaired in 5 patients. The RV was dilated in 2 homozygous sickle cell patients with systolic dysfunction in one case. The left atrium (LA) was dilated in 26,7% of cases the average volume of LA was 42,88 ( $\pm 16,14$ )ml/m<sup>2</sup> with no statistic significant difference between the groups. RA was dilated in 19,23% of cases.

#### Conclusion

The dilation of the LV is related to the increase in its volume caused by cardiac output elevation, which is explained by the severity of anemia in these patients that can lead to HF.

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## Article

### Category

Basic Sciences

### Abstract Title

Influence of different grades of CKD and HD on cardiac function using myocardial strain: Longitudinal Global Strain

### English Abstract

#### Introduction

The impact of chronic kidney disease (CKD) and hemodialysis (HD) on heart function is not fully understood.

Purpose: Assess the influence of different grades of chronic nephropathy and HD on the cardiac function using myocardial deformation: Longitudinal global strain (LGS)

#### Methods

Descriptive cross-sectional study conducted between January 2017 and January 2018, concerning patients followed for CKD sent for cardiac evaluation. The patients were classified into 3 subgroups (Control: without CKD; Medium to advanced CKD: stages 3, 4 or 5, and terminal CKD on HD. The systolic function of the LV was evaluated by echocardiography with the analysis of the LGS.

#### Results

The study included 100 patients, According to the subgroups: 33 did not have CKD (control), 27 had moderate to advanced CKD (stages 3, 4 or 5) and 40 had terminal CKD on HD. There was no significant difference in gender, age and LVEF among the groups. Compared to control group, the absolute value of SLG was decreased in the CKD groups, this decrease is parallel to the decline in renal function. In addition, compared to moderate CKD patients, LV systolic function was better in patients with CKD on HD.

#### Conclusion

Myocardial strain analysis is much more sensitive for predicting and detecting LV systolic dysfunction in patients with CKD. The decline in kidney function parallels the deterioration in heart function which may indicate that toxins play an important role in LV dysfunction, HD helps clarify toxins and improve LV function.

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## Article

### Category

Clinical

### Abstract Title

Posterior inferior cerebellar artery impingement on the medulla oblongata: a case report

### English Abstract

#### Introduction

We report a rare case of severe resistant hypertension secondary to neurogenic aetiology. Neurosurgical intervention was required to improve blood pressure control. A secondary cause for hypertension may be suspected in young subjects with uncontrolled blood pressure. Here we discuss an unusual central cause for hypertension which resolved upon surgical decompression.

#### Methods

A 45-year-old male was for investigation of refractory hypertension. The early age of onset (age 29 years) and failure of medication (11 antihypertensive medications) suggested secondary hypertension. There was no history of drug abuse, renal disease, connective tissue disease or features suggestive of endocrine disease. His blood pressure was 210/119 mm Hg and equal when measured in upper and lower limbs. He did not have any renal bruits or radio-femoral delay. After an extensive workup revealed no secondary cause we proceeded to investigate for a central nervous system aetiology of hypertension.

#### Results

Magnetic resonance imaging (MRI) with angiogram showed the right posterior inferior cerebellar artery (PICA) abutting the right side of the ventrolateral medulla oblongata. The patient underwent right rectosigmoid craniotomy for microvascular decompression of the right loop of the PICA at the dorsal root entry zone of cranial nerves IX and X. After surgery the patient experienced episodes of severe headache, chest pain and tinnitus. He was eventually discharged with adequately controlled blood pressure.

#### Conclusion

Compression of the medulla oblongata is a rare cause of hypertension. Micro-decompression of the medulla oblongata has shown benefit, but the quality of the evidence is low. Sham-controlled studies with long term follow up are required to determine the efficacy of the aforementioned procedure.

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## Article

### Category

Basic Sciences

### Abstract Title

Emotional and social contributors to higher blood pressure in children with a low quality of life: The ExAMIN Youth SA study

### English Abstract

#### Introduction

Paediatric hypertension is a growing concern since hypertension in children tracks into adulthood. One of the contributing factors for hypertension in childhood is childhood adversity or poor psychosocial well-being in children. We aimed to determine associations between blood pressure and psychosocial adversity in prepubescent children.

#### Methods

We included 892 healthy children, aged between 5 and 9 years, attending primary schools in the North-West province of South Africa. Paediatric validated automated blood pressure devices were used to measure brachial systolic (SBP) and diastolic (DBP) blood pressure. The KINDL-R questionnaire was used to calculate the quality-of-life score (QOLS). The KINDL-R questionnaire consists of 24 items collected from six subdomains namely physical well-being, emotional well-being, self-esteem, friends, family, and everyday functioning at school. The six subdomains were combined to produce a total QOLS out of 100, which was used to differentiate children in the low and optimal QOLS group. A cut-off of 55.56, was defined as a low QOLS.

#### Results

In our population, White children had a significantly lower quality of life (QOL) than children of African ancestry ( $p=0.025$ ) and DBP was also higher in the low QOL group ( $p=0.05$ ). In partial regression analysis (adjusting for ethnicity), SBP ( $r=0.18$ ;  $p=0.008$ ) correlated with family, while DBP ( $r=0.14$ ;  $p=0.048$ ) additionally correlated with emotional well-being ( $r=0.86$ ;  $p=0.035$ ). In multiple regression analysis, these results were confirmed and additionally, SBP were also independently associated with the friends subdomain (Adj  $R^2=0.169$ ; Std  $\beta=0.127$ ;  $p=0.045$ ) in children with a low QOL.

#### Conclusion

These results suggest that family, friends and emotional well-being-induced stress and anxiety may play a detrimental role in blood pressure regulation in children with a lower QOL. By addressing psychosocial risk factors possibly contributing to higher blood pressure during childhood, we can identify early intervention and preventative strategies focussing on adverse environmental exposures involved in the aetiology of hypertension development later in life.

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## Article

### Category

Population Sciences

### Abstract Title

Cognitive disorders: Atherosclerosis of the carotid artery in elderly non-stroke patients

### English Abstract

#### Introduction

An artery is essentially made up of the intima, the media and the adventitia. The intima thickens with age and other cardiovascular risk factors due to atherosclerosis which will cause plaque or stenosis or even vessel occlusion. However, the association between carotid atherosclerosis and cognitive impairment remains uncertain. Thus, this study explored the effects of carotid artery stenosis on the cognitive function of elderly non-stroke patients of Chu-Ibn Rochd.

#### Methods

Forty patients were recruited with cognitive impairment assessed by neuropsychological tests at chu-Ibn Rochd during a 3-month period from March 2022 to June 2022. An assessment of the intima media thickness of the carotid arteries, the presence of plaques and stenoses in the carotid arteries were assessed with a B-mode ultrasound examination.

#### Results

A cross-sectional relationship between cognitive performance and carotid wall characteristics was analyzed. Intima-media thickness and carotid stenosis were found in 61% and 39% of patients respectively. Patients with carotid stenosis were associated with poor cognitive performance and those with severe stenosis >70% had a lower mini-mental state examination score than the group with mild to reduced carotid stenosis (40 to 70 %). Cognitive performance differed between patients with left and right carotid stenosis, but without any significant difference and even more so when they presented with severe right or left stenosis.

#### Conclusion

Atherosclerosis of the carotid artery is correlated with cognitive disorders in the elderly Moroccan population of Chu-ibn Rochd, even more so when the stenosis is significant.

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## Article

### Category

Basic Sciences

### Abstract Title

Understanding the inter-relationships between socio-economic, socio-demographic, behavioural, and environmental factors for multimorbidity: a structural equation modelling approach

### English Abstract

#### Objectives

To use generalized structural equation modelling to understand the inter-relationships between socio-economic, socio-demographic, and environmental factors with multimorbidity.

#### Design

Nationally representative (for ≥50 years old adults) cross-sectional WHO South Africa wave 2 study.

#### Participants

1,967 individuals (men: 623, and women: 1,344) aged ≥45 years for whom data from the World Health Organization Study on global AGEing and adult health (WHO SAGE) South Africa Wave 2 between 2014 and 2015 were available. This data includes 7 health conditions to determine multimorbidity and socioeconomic, demographic, behavioral, and anthropological information.

#### Measures

Multimorbidity and depression.

#### Statistical analysis

Descriptive statistics were completed for the descriptive characteristics and tested for statistically significant associations and differences between multimorbidity categories using chi-squared tests for categorical data, and Mann-Whitney tests for the continuous characteristics, given the non-normal distributions as shown by the Shapiro Wilk test. Multivariable logistic regression analyses were conducted for the association of all the characteristics with multimorbidity and depression. Multivariable analyses performed in gSEM were based and guided by an a priori conceptual model, and gSEM analysis was used to assess associations on all pathways.

#### Results

Of the 1,967 participants, 21% (n=415) had multimorbidity and this was higher among women, and those living in urban areas. In the unadjusted logistic regression analyses, feeling "unsafe" [aOR =2.04 ; 95% Confidence Interval: 1.25; 3.42], being female, [aOR=1.93; 95% Confidence Interval: 1.02; 3.62], and older age [aOR=1.05; 95% Confidence Interval: 1.02; 1.08] were associated with higher odds for multimorbidity. In addition, being female, belonging to the highest wealth tertile relative to those in the lowest tertile, and living in an urban area were significantly associated with higher odds of depression [OR =1.39; 95% Confidence Interval: 0.59; 3.29]. Similarly, in the gSEM model, where models are estimated concurrently, demographic factors [older age (aOR=1.03, 95% Confidence Interval: 1.01; 1.05) and being female (aOR= 3.02; 95% Confidence Interval: 1.88; 4.86)] and behavioural factors [individuals with history of tobacco avoidance (aOR=0.46; 95% Confidence Interval: 0.27;0.75), and good sleep quality (aOR=0.59; 95% Confidence Interval: 0.39;0.91)] were significantly associated with multimorbidity. Moreover, using the gSEM approach, multimorbidity was associated with two-fold greater odds of depression (aOR=2.41; 95% Confidence Interval: 1.36;4.28).

#### Conclusion

The results indicate that multimorbidity in middle-aged and older adults is a relatively common condition that is influenced by behavioral, demographic, and environmental factors. Given that the primary health (PHC) system in South Africa remains single-disease-focused in the treatment of patients, efforts should be made to manage multiple conditions concurrently at PHC centers. In addition, these inform policymakers to prioritize the older population, females, and tobacco users and enhance environmental safety in prevention programs.

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## Article

### Category

Clinical

### Abstract Title

Results for the May Measurement Month global campaign from a university campus

### English Abstract

#### Introduction

High blood pressure is often referred to as the "silent killer" where up to 50% of patients remain undiagnosed. May Measurement Month (MMM) is an annual global campaign, run by the International Society of Hypertension (ISH), that seeks to raise awareness regarding high blood pressure and promote free blood pressure screening during Hypertension Awareness Month. South Africa has been a collaborator in this campaign since 2017. The Screening and Testing Programme for Pharmacy Students (STEPPS) at the University of the Witwatersrand has been screening for hypertension since inception, particularly during May Measurement Month.

#### Methods

From May 2022 to August 2022, the STEPPS programme screened patients for hypertension using a validated screening method at all Wits University campuses and through outreach events. Convenience sampling was used to recruit participants. Blood pressure was measured using an automated Omron device and was recorded simultaneously with the participants answers to the ISH standardised questionnaire on a single MMM data capture form. A total of three blood pressure readings was taken for each patient. The data was captured into Microsoft Excel for statistical analysis.

#### Results

A total of 1204 participants were screened for hypertension with an average age of 23 years (ages ranging 18-71 years). Forty-three participants were found to have systolic and diastolic blood pressure readings within hypertensive range with an additional 23 having isolated systolic hypertension. Isolated diastolic hypertension was reported in 134 participants. In total 200 participants (16.61%) that met the range classification for hypertension were identified and referred for assistance.

#### Conclusion

The MMM campaign proved to be a practical and effective campaign for identifying participants to be referred for follow-up for high blood pressure and for spreading awareness in promoting early detection and screening for hypertension. The university campus is an ideal screening site for identifying the potential hypertension population from an early age and annual participation would be beneficial to the university population.

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## Article

### Category

Basic Sciences

### Abstract Title

Eradication of *Helicobacter* spp. in spontaneously hypertensive rats reduces blood pressure to that of ancestral Wistar Kyoto rats

### English Abstract

#### Introduction

Hypertension is a major risk factor for cardiovascular disease with the cause of essential hypertension remaining unknown. Rat models used to study hypertension include the spontaneously hypertensive rat (SHR) which was bred from the Wistar Kyoto (WKY) rats. Studies have shown an association between infection with the human ulcer causing bacterium *Helicobacter pylori* and hypertension, increased blood pressure (BP) and a decrease in BP following successful eradication. The aim of this study was to determine the impact of eradicating *Helicobacter* spp. in WKY and SHR rat models of hypertension.

#### Methods

Ethics approval for the study was obtained. SHR and WKY rats on normal chow and ad lib access to water were habituated to tail cuff measures. Rats were treated by gavage for 3 days with standard antibiotics to either eradicate *Helicobacter* spp (n=6 per strain) or other non-*Helicobacter* micro-organisms (n=6 per strain). Eradicated rats (negative stool PCR) were re-infected with the human pathogen *H. pylori*.

#### Results

Antibiotic treatment resulted in BP decreasing from 175±6mmHg to 120±5mmHg (p=0.0039), and 139±3mm Hg to 113±6mm Hg (p=0.0065) in SHR and WKY rats respectively, without differences between eradicated WKY and SHR. BP increases after reinfection were modest and did not attain pre-eradication levels.

#### Conclusion

BP in SHR decreased to those of the ancestral WKY rat strain after treatment to eradicate *Helicobacter* spp. The modest BP increase following re-infection with *H. pylori* may reflect the use of a non-rodent species. Further work is needed determine the role of *Helicobacter* spp. in the etiology of hypertension.

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## Article

## Category

Clinical

## Abstract Title

Significance of arterial hypertension in the acute infection and post-covid period based on the data from international ACTIV SARS-CoV-2 registry

## English Abstract

## Introduction

Cardiovascular disease may adversely affect the incidence rate, severity of acute infection and post-covid period, and mortality rate associated with the new coronavirus infection.

## Methods

An international registry ACTIV SARS-CoV-2 was established to evaluate the course of COVID-19 and involved experts from 7 countries (ClinicalTrials.gov: NCT04492384). The course of the acute period was assessed using data from 5808 patients. The course of post-covid period was assessed using the results of telephone calls to 2185 patients 3 months after recovery and to 1208 patients 6 months after recovery.

## Results

55.41% of the patients had arterial hypertension (AH) when they acquired the infection and were more likely to require in-hospital treatment (60.85% vs. 30.84% outpatients,  $p < 0.001$ ).

AH in COVID-19 patients increased the mortality odds ratio both in the acute and the post-covid period. The mortality odds ratio was higher in patients over 60 and with multiple chronic comorbidities (Table 1).

Table 1. Effects of AH on COVID-19 outcomes in the acute period and 3 months after recovery.

Comorbidity types	Surviving patients	Lethal outcomes	P	Odds ratio (95% CI)
Acute infection, hospitalized patients (n=4751)				
AH, %	59.88	82.33	<0.01	3.123 (2.324-4.198)
AH+age over 60, %	38.78	70.57	<0.01	3.785 (2.946-4.862)
AH+obesity, %	26.12	36.99	<0.01	1.661 (1.266-2.178)
AH+IHD, %	18.86	43.50	<0.01	3.311 (2.532-4.33)
AH+CHF, %	15.82	42.68	<0.01	3.963 (3.022-5.197)
AH+CHF+IHD, %	10.74	32.93	<0.01	4.082 (3.054-5.455)
AH+obesity+diabetes, %	9.1	17.89	<0.01	2.177 (1.535-3.086)
AH+obesity+IHD, %	7.42	16.26	<0.01	2.421 (1.68-3.488)
AH+CHF+IHD+obesity, %	3.98	13.82	<0.01	3.869 (2.578-5.806)
AH+CHF+IHD+diabetes, %	3.55	13.41	<0.01	4.215 (2.784-6.382)
AH+CHF+IHD+history of MI, %	3.65	10.16	<0.01	2.99 (1.896-4.716)
3 months after recovery (n=2185)				
AH, %	47.16	82.93	<0.01	5.442 (2.402-12.330)
AH+age over 60, %	28.65	78.05	<0.01	8.857 (4.202-18.665)
AH+IHD, %	2.41	9.76	0.003	4.373 (1.502-12.728)
AH+CHF, %	7.28	31.71	<0.01	5.909 (3.000-11.640)
AH+CHF+IHD, %	5.72	24.39	<0.01	5.313 (2.545-11.092)

Increased BP over prior effective antihypertensive treatment was reported in 18.6% and 19.1% of patients in 3 and 6 months, respectively. Uncontrolled AH was the most common cause of medical care encounters (40.2% and 37.1%, respectively). AH accounted for 41.5% and 46.7% of the newly diagnosed conditions during 3- and 6-months follow-up, respectively.

## Conclusion

AH increased hospitalization rate and negatively impacted the prognosis of the acute period in hospitalized COVID-19 patients and their prognosis during the first 3 months after recovery. The mortality risk increased in the patients over 60 and with several chronic conditions. AH was the most common newly diagnosed condition in the post-covid period. The presented data should be taken into account when planning prevention, treatment, and rehabilitation for COVID-19 patients.

Submission ID: 1384 *continued*

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## Article

### Category

Basic Sciences

### Abstract Title

L-homoarginine, cardiovascular function and mortality risk in Black South Africans

### English Abstract

#### Introduction

L-homoarginine is an endogenous homologue of L-arginine that has been proposed as an alternative substrate for the synthesis of nitric oxide (NO). We investigated the associations of L-homoarginine with hypertension, carotid wall thickening, and cardiovascular-related mortality.

#### Methods

We measured plasma L-homoarginine concentrations using liquid chromatography-tandem mass spectrometry in n=669 South African participants from the Prospective Urban and Rural Epidemiology study (mean age 59.5 years). Associations of plasma L-homoarginine were investigated with (i) blood pressure in incident hypertension after 10-years; (ii) carotid wall thickening as indicated by carotid intima-media thickness (cIMT) and cross-sectional wall area (CSWA); and (iii) both cardiovascular and all-cause mortality.

#### Results

In multivariable regression analyses, baseline L-homoarginine positively associated with brachial systolic blood pressure ( $\beta=0.33$ ;  $p=0.001$ ), brachial pulse pressure ( $\beta=0.40$ ;  $p=0.001$ ), and central pulse pressure ( $\beta=0.30$ ;  $p=0.003$ ) in the group that remained normotensive after 10 years. In the group that developed hypertension after ten years, no significant associations were found. In the total group, follow-up cIMT ( $\beta=-0.10$   $p=0.018$ ) and CSWA ( $\beta=-0.12$ ;  $p=0.004$ ) inversely associated with baseline L-homoarginine. During a median follow-up of 9.8 years, n=143 participants died, of which n=40 was cardiovascular-related. Higher baseline plasma L-homoarginine was associated with lower cardiovascular (hazard ratio per SD increment=0.61; 95%CI: 0.50-0.75) and all-cause (hazard ratio per SD increment=0.59; 95%CI: 0.41-0.84) mortality risk.

#### Conclusion

Our findings suggest a protective role of L-homoarginine against the development of hypertension, carotid wall thickening and both cardiovascular and all-cause mortality. Regulation of L-homoarginine levels as a therapeutic target in the management of CVD should be further investigated.

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## Article

### Category

Clinical

### Abstract Title

Obesity paradox in patients with stable angina

### English Abstract

#### Background

Obesity is a strong predictor for the development of cardiovascular diseases. Despite this fact, there are some reports of paradoxically better prognosis among obese patients.

#### Purpose

We sought to evaluate the differences in angiographic characteristic, early and long-term in patients with stable angina (SA) depending on body mass index (BMI) intervals.

#### Methods

A total of 6880 consecutive patients with available BMI value from the PRESAGE Registry were analyzed. In brief, the PRESAGE Registry is an ongoing, single-center, prospective observational study recruiting consecutive patients with SA. Study population was divided depending on BMI intervals: underweight - <18.50 kg/m<sup>2</sup>; normal weight - 18.50–24.99 kg/m<sup>2</sup>; overweight - 25.00–29.99 kg/m<sup>2</sup>; 1-st degree obesity - 30.00–34.99 kg/m<sup>2</sup>; 2-nd degree obesity - 35.00–39.99 kg/m<sup>2</sup>; 3-rd degree obesity - >40.00 kg/m<sup>2</sup>. The main outcome measure was 36-month all-cause death, non-fatal myocardial infarction and acute coronary syndrome (ACS)-driven revascularization.

#### Results

The percentage of study population depending on BMI intervals were respectively: 0.6% for underweight, 20.3% for normal weight, 45.3% for overweight, 25.7% for 1-st degree obesity, 6.7% for 2-nd degree obesity and 1.4% for 3-rd degree obesity. With higher BMI value, an occurrence of hypertension, hypercholesterolemia and diabetes mellitus were increasing. Patients in the underweight group had the lowest left ventricular ejection fraction and frequency of prior heart failure. The angiographic characteristics and treatment were comparable in analyzed groups with exception for lower rate of revascularization in underweight patients. In-hospital and early-term outcomes were similar in analyzed groups. At 36-month patients with 1-st degree obesity had the lowest, while underweight and 3-rd degree obesity were associated with the highest rates of mortality (26.7% for underweight, 12.1% for normal weight, 10.8% for overweight, 8.0% for 1-st degree obesity, 10.1% for 2-nd degree obesity and 17.2% for 3-rd degree obesity;  $P=0.0006$ ). Incidence of MI and ACS-driven revascularization were comparable in analyzed groups. In Cox proportional hazards model, 1-st degree obesity was an independent factor of favorable 3-year mortality (hazard ratio 0.71; 95% confidence interval 0.57–0.89;  $P=0.0035$ ).

#### Conclusion

In PRESAGE Registry, the obesity paradox in 36-month mortality was confirmed. 1-st degree obesity is an independent predictor of favorable long-term mortality.

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