Speakers presentation highlights

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HOW STENT TECHNOLOGY REVOLUTIONISED THE TREATMENT OF CARDIOVASCULAR DISORDERS: FROM CORONARY AND VALVE DISEASE, TREATMENT OF PERIPHERAL VASCULAR DISEASE (PVD), TO STROKE PREVENTION AND TREATMENT

Session: Carotid intervention: How stent technology revolutionised the treatment of cardiovascular disease: from the brain to the feet

Andreas Gruentzig launched the discipline of Interventional Cardiology with his groundbreaking work on peripheral and coronary balloon technology. Coronary and peripheral stent technology evolved on "his shoulders" and his balloon.

Roubin and Gianturco developed the first balloon-expandable coronary stent. The science and clinical success of this metal prosthesis in the delicate, constantly moving coronary vessels engendered confidence in stent technology. Palmaz enhanced this work with his balloon-expandable, laser-cut mesh. Gianturco also developed the first clinically applied self-expanding stent. All work that underpinned the remarkable progress made in stent treatments for aortic disease – aneurysm, dissection, and a myriad of stent graft and self-expanding stent devices.

Today, the clinical application of stent technology extends from critical limb ischaemia to disabling claudication, renal and mesenteric stenosis, treatment of acute myocardial infarction and angina, aortic, mitral and tricuspid valve disease, left atrial appendage closure, acute stroke treatment with stent thrombus retrievers, to stroke

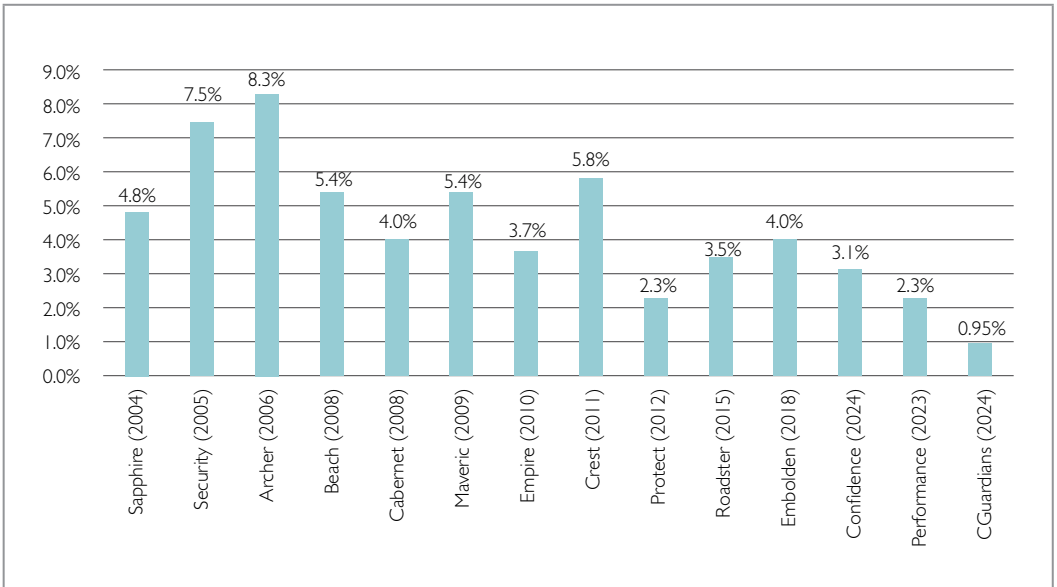

Figure 1: Death, stroke, myocardial infarction (DSMI) rate through 30 day follow-up post carotid artery stenting

prevention with carotid stents. Scientific and clinical progress in all areas of the vasculature has been outstanding; however, none more than the application of carotid stenting to prevent stroke. Over the last 30 years, the evolution of carotid stent technology and technique, backed by rigorous clinical trials, has resulted in a uniquely safe and less invasive treatment for critical carotid artery disease.

The currently unprecedented outcomes for the stenting of high-grade asymptomatic carotid stenosis – 0.4% risk of death/stroke and myocardial infarction – change the therapeutic paradigm (Figure 1). The landmark NHLBI CREST 2 trial will provide comparative outcomes in the cohort of patients managed with optimal medical management alone.

LIFETIME MANAGEMENT OF TAVR PATIENTS – THE EVOLVING SCIENCE IN LEAFLET TECHNOLOGY AND MANAGEMENT TO OPTIMISE PATIENT OUTCOMES

Session: Lifetime management of TAVI valves: Methods to prolong leaflet function

Percutaneous TAVR treatment of aortic stenosis has revolutionised the management of this important disorder. Rigorous science has demonstrated that this interventional, less invasive approach is as safe and effective as surgical aortic valve replacement (SAVR). TAVR is not only effective in patients at high risk for surgery, but also shows efficacy for younger, low-risk patients. Recent evidence also indicates that previously considered benign stages of aortic stenosis have poorer outcomes than previously thought. Accordingly, a dramatic increase in the use of TAVR has occurred in an increasingly younger patient population.

Consequently, there has been an intense interest in the bioprosthetic valves' longevity for both TAVR and SAVR. Good data demonstrate that bioprosthetic valve dysfunction for both TAVR and SAVR is comparable. These valves may deteriorate in as little as 4 years, although current outcome data suggest acceptable longevity for 8–12 years or longer. Fortunately, a percutaneously placed second prosthesis, either transcatheter aortic valve (TAV)-in-TAV or TAV-in-surgical aortic valve (SAV), can be done safely and effectively in the majority of failing valves.

Valve modification to enhance the safety, efficacy, and longevity of subsequently placed prosthetic valve leaflets is undergoing extensive study. Coronary obstruction and/or access caused by the prior leaflets is a potential immediate problem. Nonetheless, there is an important question of subsequent valve function and the effect of the thickened and often calcified leaflets that are currently retained behind the second stent/valve "cage". Included in the issues being studied are the deformity of the second prosthesis affecting leaflet function, the effect of the still biologically active residual leaflets (Sodium Fluoride labelled with fluorine18 [18F-NaF] positron emission studies) on the new leaflets, the effect of protruding calcium nodules on new leaflet longevity, and a potential problem with the abnormal "neo-sinus" that is created.

Evolving technology has been developed to remove or modify these effects. This involves cutting and splitting the leaflets or percutaneously excising a large amount of the leaflet before transcatheter aortic valve placement. While currently focused on TAV-in-TAV and TAV-in-SAV procedures, this technology may evolve for use in native aortic valves prior to an index procedure.

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RESEARCH IN CHILDREN'S HEART DISEASE IN AFRICA
Session: Paediatric cardiology – Unifying hearts and minds

Despite being the most common birth defect globally, congenital heart disease (CHD) remains underdiagnosed, undertreated, and under-researched across most of Africa. This presentation will explore the current landscape of CHD research in African children, highlighting major gaps in data, equity, and health system integration. Drawing on landmark work from Tanzania, including the Tanzania POX Screening Study and the development of a paediatric cardiac surgery programme at Jakaya Kikwete Cardiac Institute (JKCI), the session will showcase how African-led research is transforming child survival. The talk will conclude with a proposed research agenda focused on early detection, longitudinal outcomes, quality of life, and sustainable local solutions.

QUALITY ASSURANCE IN PERI-OPERATIVE CARE
Session: Paediatric surgical and critical care pathways

This session will focus on how quality assurance frameworks can be effectively applied to improve outcomes in peri-operative care for children undergoing cardiac surgery in low-resource settings. Drawing from institutional experience at JKCI, the presentation will outline practical strategies to strengthen monitoring systems, clinical audits, multidisciplinary team coordination, and infection prevention in paediatric cardiac intensive care units (ICU). Emphasis will be placed on context-appropriate indicators, data use for continuous improvement, and how local leadership can drive culture change toward safer, more reliable peri-operative care.

NEWBORN SCREENING FOR CRITICAL CONGENITAL HEART DISEASE
Session: Innovations in neonatal cardiac diagnosis

Early detection of critical congenital heart disease (CCHD) remains a challenge in Africa, where routine postnatal screening is rare. This presentation shares Tanzania's experience in piloting the first large-scale implementation of pulse oximetry screening for over 10 000 newborns, highlighting the diagnostic yield, implementation feasibility, and frontline health workers' perspectives. The session will discuss lessons learned from integrating screening into routine maternal and newborn care, addressing barriers, and using data to advocate for national policy change. The experience underscores the importance of implementation science and systems thinking in making life-saving early diagnosis a reality.

Prof Bernard J Gersh
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THE "TWIN EPIDEMICS" OF HFPEF AND AF: EPIDEMIOLOGY AND MANAGEMENT
Session: The "twin epidemics" of HFpEF and AF: epidemiology and management

Regarding the epidemics of heart failure with preserved ejection fraction (HFpEF) and atrial fibrillation (AF), current demographic trends and risk factors point to a "perfect storm", with obesity playing a pivotal role. Obesity is integrally linked to HFpEF, with approximately 80% of individuals with HFpEF being either overweight or obese. The relationship is multifactorial, including interactions with comorbidities and hypertension, diabetes, sleep apnoea, and chronic kidney disease. Moreover,

the associations between obesity and AF incidence and prevalence in response to therapies are well-documented and indisputable. From the prognostic standpoint, the development of AF in patients with HFpEF is an adverse prognostic feature, and HFpEF in turn accelerates the progression of AF from paroxysmal to persistent/chronic, possibly by causing annular dilatation and left atrial enlargement due to increased filling pressures. From a therapeutic standpoint, the control of hypertension, exercise, and weight reduction are essential adjuncts to newer pharmacological agents. A diverse array of non-pharmacological approaches is currently under investigation. Catheter ablation is promising and the focus of current and future trials.

POLYPHARMACY, DEPRESCRIBING, AND THE NEED FOR NEW TRIALS OF OLD DRUGS

Session: Cardiology for Non-Cardiologists Workshop

The issue of polypharmacy is highly relevant clinically, given the growing number of elderly patients with chronic conditions, and the fact that polypharmacy is not only common but a major cause of non-compliance and drug-related side effects. Recently, 2 reviews in the ***European Heart Journal*** and ***Nature Reviews Cardiology***, by myself and colleagues, addressed the topics of deprescribing and the need for new trials of old drugs. A particular focus was the role of angiotensin-converting enzyme inhibitors (ACEI)/angiotensin II receptor blockers (ARBs) in acute and chronic cardiovascular disease (CVD) and beta blockers in survivors of myocardial infarction. Regarding the former, the trials took place in the 1990s, and the beta blocker trials by and large antedated the reperfusion era. Moreover, most trials have a relatively short follow-up (1–42 months for the ACE inhibitor trials). However, in practice, the same drugs may be prescribed for years, during which the effects of age, renal function, and comorbidities may heavily impact the risks versus benefits, warranting continued reassessment. Trials of beta blockers in myocardial infarction survivors are ongoing and will be discussed. In general, polypharmacy could be considered as "less may be more".

RISK STRATIFICATION IN CHRONIC CORONARY SYNDROMES: ANATOMY, ISCHAEMIA, OR BOTH? THINGS MAY NOT BE AS THEY SEEM

Session: Risk stratification in chronic coronary syndromes: Anatomy, ischaemia or both

The results of revascularisation in patients with acute coronary syndromes, and particularly ST-elevation myocardial infarction (STEMI), have been dramatic. However, in patients with chronic coronary syndromes (CCS), the benefits of revascularisation over medical therapy have been more difficult to demonstrate, especially in patients with normal left ventricular function. A presumption that the extent and severity of ischaemia would identify patients at higher risk of CCS who would benefit from revascularisation was the emphasis of the ISCHEMIA Trial. The trial was neutral about the comparison between an invasive strategy and optimal medical therapy, but, somewhat to our surprise, the relationships between the severity of ischaemia and the extent and severity of coronary artery disease were weak. This data suggests that a new approach is needed to identify therapeutic targets in patients with CCS. Perhaps we are now entering the era of plaque and endothelial characterisation, as well as plaque vulnerability, as new targets in addition to the role of the microvasculature. This presentation will focus on these new targets and the role of imaging in detecting inflammation, plaque burden and vulnerability, and their potential impact on prevention.

THE FUTURE OF CARDIOLOGY

Session: Artificial Intelligence | AI: The Heart of the Matter

"The history of medicine is that what was inconceivable yesterday, and barely achievable today, often becomes routine tomorrow." This reflection from the late Dr Starzl (transplant pioneer) came after decades of pioneering work, including the first 2 liver transplant attempts in 1963, and subsequent advances that overcame initial failures and challenges.

Rapid changes in imaging, technology, and messenger ribonucleic acid (mRNA) therapeutics make predictions particularly difficult. Nevertheless, I will focus on a few trends in cardiology that I believe will soon be important. The first is the emphasis on prevention, encompassing primary, secondary, and primordial. New approaches to risk stratification, combining imaging and "omics", with potential therapeutic revolutions such as mRNA-targeted therapeutics and gene editing, will likely lead to identifying an increasing number of younger patients who could benefit from early and aggressive risk factor modification. Perhaps the epidemic of atherosclerosis can eventually be reversed.

We have entered the disruptive and exciting era of artificial intelligence (AI), with its promises, potential, and pitfalls. Nonetheless, AI will undoubtedly change the face of medicine and research, and we will have to learn to live with it and use it.

Percutaneous structural interventions could profoundly change the natural/unnatural history of valvular heart disease, leading to earlier interventions and, hopefully, improved outcomes. The explosion of knowledge and technology will inevitably shift towards departments of cardiovascular medicine, away from traditional concepts in departments of internal medicine, surgery, radiology, and others.

The future is exciting, but there are dark clouds on the horizon. These are the epidemic of obesity and diabetes, the effects of climate change on cardiovascular health, the concerning impact of disinformation, and growing disparities in socio-economic status, which is increasingly recognised as a key factor underlying optimal healthcare access and utilisation. Another consistent barrier to therapeutic success is the problem of patient non-compliance, possibly related to socio-economic circumstances. Perhaps the digital age can provide us with new tools to combat this widespread and frustrating issue.