

Leaders in Cardiovascular Medicine

Dr Karen Sliwa: 'Out of Africa' from Germany via Japan, to become a leader of cardiac diseases in Africa



Karen Sliwa

Karen Sliwa, MD, PhD, FESC, FACC is Director of the Hatter Institute for Cardiovascular Research in Africa (see names of the persons are below the photo) at the University of Cape Town, South Africa and has a joint clinical appointment at the Department of Cardiology, at Groote Schuur Hospital. She is also co-chair of the Soweto Cardiovascular Research Group of the University of the Witwatersrand, Johannesburg. She is globally recognised for her work in heart failure and cardiac disease in pregnancy as well as the *Heart of Soweto* studies.

Tell me about yourself?

I was born in Freiburg, Germany and spent some of my early years in Japan. I studied medicine at the Free University in Berlin, and immigrated to South Africa in 1992. I have been married for 23 years to an orthopaedic specialist and spinal surgeon and we have two daughters, Lina, 23, who is studying medicine, and Julia, 19, who is doing science. Both are interested in health and seem to have inherited their parents' passion for medicine and research. My husband and I am both clinician-scientists and love living in South Africa. Africa is a great place to do clinical work and research because one can easily make an impact and there are so many unknowns and things waiting to be discovered.

How did your interest in cardiology and science develop?

I initially wanted to be a specialist general practitioner because I have a strong public health interest. While I was training as an internist



Hatter Institute for Cardiovascular Research in Africa Team, March 2015

Front row: Dr Gasnat Shaboodien, Prof. Karen Sliwa, Prof. Lionel Opie, Prof. Sandrine Lecour, and Mr Victor Claasens (retired). **Middle row:** Mr Mlamblli Tshaka, Dr Gaurang Deshpande, Mr Stephen Kamuli, Ms Tasneem Adam, Ms Sylvia Dennis, Ms Aqeela Imamdin, Ms Janine Saaiman, Ms Lameez Pearce, and Ms Olivia Briton. **Back row:** Ms Patricia van der Walt, Mr Babu Mohamed, Dr Nkanyiso Hadebe, Dr Bert Mohr, Dr Frederic Ndhuirabandi, Dr Azhar Seedat, Ms Tafadzwa Machipisa, and Dr Wentzel Dowling.

and concurrently doing a diploma in tropical medicine & hygiene at Chris Hani Baragwanath Academic Hospital, (CHBAH) in Johannesburg, I became interested in Peripartum Cardiomyopathy (PPCM) and started to investigate, and that's how I got sucked into becoming a cardiologist.

Where and with whom did you do your medical training?

I had the advantage of studying and training in Germany and South Africa which was important in my development because Germany is very research and technique-orientated, whereas South Africa is very hands-on and practical. In Germany, there was little bedside teaching so I found my own opportunities in places like the Philippines, India, and Israel. I was very unusual in my peer group for stepping out of class for a year to do research, but I spent a year at Hadassah University, Jerusalem in a fantastic department run by

Prof. Sidney Klaus. I was very well supported and encouraged to ask whatever questions I wanted and to see patients alone for the first time. I was >10 years younger than everyone else and it forced me to really think and be confident. Later, at CHBAH in the Soweto district of Johannesburg, training involved a massive clinical caseload including dealing with numerous gun shot wounds and injuries which were due to high crime in the impoverished neighbourhood in the 1990s. What I learned there was to be the sort of hands-on practical doctor which South Africa is famous for producing.

Which single person influenced you the most?

Prof. Klaus from Hadassah University taught me to ask about things I really wanted to know, and Ken Huddle, professor of internal medicine at CBBAH taught me the dignity of the patient. He extended this dignity to all patients, but particularly those from very poor backgrounds. He taught me to really attend to them and not speak above them and this influenced my ethical approach to patients, which in turn influenced my research interests. I always ask patients about schooling, income and social and background for my research which very few cardiologists do, but Ken Huddle taught me to look at the patient in their own context and take all of that into consideration.

What are your key areas of research, and how was your interest in these areas aroused?

I am known for my work in PPCM, which followed on from my PhD in South Africa investigating the role of inflammatory cytokines contributing to heart failure as a result of cardiomyopathies. Although work from my PHD in 1998 was subsequently published in *The Lancet*, the realization that broad cytokine inhibition blocks the pathways contributing to heart failure came too late and further work was necessary to tackle the problem. I explored the option of targeting molecules further upstream, leading to research with molecular biologist Denise Hilfiker-Kleiner from Hanover, Germany which led not only to a better understanding of the mechanisms of the disease, but to a promising new and affordable medication. This work which was published in *Cell* in 2007 and subsequently *Circulation* in 2010, was highly relevant as PPCM has a high mortality rate in African women. The findings were highlighted in subsequent guidelines and position papers and led to the Euro Observational Research programme on PPCM funded by the European Cardiac Society, which I chair with Prof. Rupert Bauersachs. I then progressed into exploring CVD in pregnancy and postpartum which led to changes in recommendations for recording maternal death.

The other main area is the epidemiology of cardiovascular disease (CVD), and in particular the causes of heart failure in South Africa and Africa. With Prof Simon Stewart of Melbourne, Australia, visiting professor at the University of the Witwatersrand, I initiated the *Heart of Soweto* studies reporting on the prevalence, presentation, and management of cardiac disease in an urban African population of 8000 patients. The results were published in *The Lancet* and led to over 20 publications describing the prevalence of Rheumatic Heart

Disease in adults (*Eur Heart J* 2012) as well as the impact of HIV/AIDS on CVD, making me a world-recognized expert in cardiac conditions common in Africa.

I am also part of the global burden of disease team of the Institute for Health Metric and Evaluation which has published seven papers in the *Lancet* since 2012. This is an important part of my work and involves screening relevant cardiovascular research performed in Africa which contributes to the analysis, data interpretation and discussions around not just CVD, but other diseases too.

I also spend a lot of time nurturing promising researchers in Africa and have 10 cardiologist PhD students under my wing at the moment. Our training model is completely different to taking the cardiologist out of Africa and sending him or her to London or America for 3 years. It's really important for them to be able to do the research in their own countries and environment so they stay there apart from coming to see me twice a year. I travel to assess their working environment and then we plan a project around what is there and what is interesting and important. They complete their PhD via the University of Cape Town or University of the Witwatersrand, but the project itself is in their own country. My last student published five papers from his PhD and a recent graduate has already published seven papers. Three of only 20 places in the World Heart Federation emergent leader programme belong to my African students.

How has your research evolved?

My scientific training started with my doctoral thesis (*in vitro* and *in vivo* studies of the efficacy of Iloprost (Prostacyclin) in two protozoal diseases (cutaneous leishmaniasis and cerebral malaria) at Hadassah University and this led to a registered patent on the TNF- α inhibiting properties of prostacyclin. I expanded my research exploring the broad cytokine inhibiting activities of Pentoxifylline in a mouse model of cerebral malaria, working for 2 years at the Tropical Disease Institute in Berlin, and continued this research with a PhD in South Africa, investigating the role of inflammatory cytokines contributing to heart failure due to cardiomyopathies. At that time, this was a totally novel concept but it was not good enough for me and I continued with Prof. Hilfiker-Kleiner, dissecting the mechanisms of disease on PPCM. Our experimental data strongly suggested a detrimental effect of prolactin, which is cleaved into an anti-angiogenic and pro-apoptotic 16 kDa isoform destroying endothelial cells and leading to apoptosis and heart failure.

I broadened my research into CVD in pregnancy and postpartum and highlighted a disturbingly high mortality beyond the standard period of reporting of maternal death (42 days). This resulted in recommendations of recording of later maternal death, as published in *The Lancet*.

My population studies which originally focused on the Soweto area of Johannesburg were expanded to other African countries in a very large collaborative project by cardiologists from countries including Mozambique, Nigeria, Cameroon, Uganda, Kenya, Sudan, and Ethiopia.

My research is and always has been guided by curiosity, for example, my thesis on Leishmaniasis came about because my brother who is a zoologist contracted the disease and I wanted to know more about it. Similarly, when my children's nanny developed PPCM, I wanted to discover more about it. This is the way I work, I see something that is puzzling, I start reading and I pursue it until I know more about it.

Which piece of work are you most proud of?

I am proud of being part of two specific things: the first is setting up the *Heart of Soweto* studies. We had to restructure an entire clinic, work well as a larger team and did not get a single official grant for the work which eventually led to a publication in the *Lancet* and 25 others. Nobody believed it was worth investigating people in Soweto—one of the most deprived urban areas in the world—and we had to find funding from all sorts of unusual avenues. So, I am proud not only of the papers but also of the innovative approach to tackling a problem. The second thing is PPCM. I contributed not only to our understanding of the mechanism of the disease but also to the management and treatment of PPCM. However, all that would not have been possible without my long-standing collaborators who I now call my friends.

What do you do outside your profession?

I strongly believe in a good life-work balance—spending time with my family and friends is special for me. I am also a keen traveller not just for work but also in my leisure time. I am really an outdoor person enjoying long hikes in the Cape Region Mountains, diving, and horse riding. In addition, I am passionate about arts and reading books.

Which book would you take to a remote island and why?

I have just finished a book called *A Heart So White* by Javier Marais, a Spanish author who writes about how things that happen in life can be seen from different perspectives. He writes in long sentences, a bit like German and he's written around 20 novels, so I would take the set and finish the ones I have not had chance to read.

What advice would you give to young researchers who are just setting out?

First, you should be passionate and curious about your work. It's also very important to be able to work in teams, both in your own speciality and in an inter-disciplinary way. Women in particular, who make up fewer than 10% of cardiologists in the USA, South Africa, and Germany, also need to develop a thick skin in what can often be an aggressive and competitive environment. You need to accept that not everyone will like you, which is hard for women, but it is important to be respected. Accept that you will fail many, many times and that is normal. It is not possible to be innovative and successful and being scared to fail.

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