

Interview with Prof. Dr. Navin C. Nanda

Prof. Dr. Navin C. Nanda ile Söyleşi

Prof. Dr. Navin Nanda has dedicated his life to develop, to promote, to disseminate and most important of all, to teach knowledge. He is truly an honourable citizen of the world, and he is more of a brother to us than a colleague. I had the privilege to get to know him when I was working with him in Rochester, New York in 1982. We had to opportunity to meet again during his visits to Mardin and Şanlıurfa, Turkey. Although he is 10 years older than me, he is more active and productive. We would like to thank Prof. Dr. Navin Nanda and Dr. Gültekin Karakuş for this interview.

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Interview

Dr. Gültekin Karakuş: Dear Professor Nanda, first of all, I would like to thank you for accepting our request of interview.

Prof. Dr. Navin Nanda: You are welcome.

I would like to start with birth which is the beginning of the journey of each of our lives, where and when were you born?

In 1937, I was born in Kenya where my father was a practicing physician. Both my parents were from India.

How long did you stay in Kenya?

Till the end of World War 2, I stayed in Kenya. I completed the University of Cambridge School Certificate examination with distinctions in English Language, History, Mathematics and Science, I was planning to travel to England for further studies at Oxford University on a scholarship but my mother insisted I go to India instead so as to become familiar with my roots in my country of origin. Also, she was not keen I marry an English woman which would be a strong possibility if I went to England. She wanted an Indian daughter-in-law, which she thought would be most likely if I went to India.

So, your adventure of medical education started like this.

Yes, I went to India and began my science studies at Eliphinstone College, Bombay and my medical studies at Seth G.S Medical College and King Edward Memorial Hospital,

Bombay University. After medical graduation, I did internship in medicine (6 months) and surgery (6 months) at King George VI Hospital, Nairobi, Kenya. The attendings were all from England and interestingly I worked under some who had been trained by my father in some procedures such as cataract surgery. After completing my internship, at my father's request I tried to take over his flourishing medical practice but decided instead to go back to Bombay for completing postgraduate studies in Medicine and Cardiology at the same college and hospital where I had graduated from. By this time, my father had retired and both he and my mother went to India and settled in Jaipur where he began doing charitable medical work.

Do you remember your first published paper?

It was a study about hyperglycemia after myocardial infarction and its relationship to diabetes mellitus. It was published in the New England Journal of Medicine in 1967 and it received editorial praise as an "important contribution" and "the first thorough study of an Asiatic population". My M.D. postgraduate thesis was "Myocardial Infarction in Young Adults". I had no difficulty in collecting several patients under the age of 40 years with acute myocardial infarction many of whom were thin and had normal serum cholesterol levels. At that time cholesterol



Figure 1. Dr. Ming C. Hsiung (left, Taipei, Taiwan) and Dr. Navin C. Nanda (right) in Beijing, China, April 1982. Dr. Nanda was the invited Speaker and Visiting Professor at the Chinese People's Liberation Army General Hospital and Military Post-graduate Medical School

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Figure 2. King Edward Memorial Hospital, Bombay, Diamond Jubilee Award (Gold Medal) in Cardiology (for pioneering and outstanding contributions in Echocardiography), 1985. Recognized as the most outstanding cardiologist of the institution in the last 60 years. Left to right: Dr. G.B. Parulkar, dean of the Hospital, Dr. Sushil Munsif, Dr. S.R. Shah, Dr. Navin C. Nanda and Dr. Ivan J. Pinto (far right)

testing had just begun in India. They were also non-diabetic. However, many were smokers and had arcus senilis, which we put down to premature ageing at that time but now we know is related to pollution, a recently recognized factor for coronary artery disease. These patients lived and worked in the industrial area surrounding our hospital and medical school. I presented this work at the Bombay Medical Congress and won the first prize for presenting the best paper. The paper was subsequently published in the J.J. Group of Hospitals Journal in 1967. My mentors in India were Drs. K.K. Datey and Ivan J. Pinto, under whom I worked for 3 years in Cardiology (and Medicine).

Did you go to England after completing your Fellowship in India?

Because of the seminal research work I had done in India, I was encouraged by my superiors to go to England for further studies and to apply for a Fellowship at the prestigious Institute of Cardiology and National Heart Hospital in London, England, where the famous English cardiologist Paul Wood had been the Director. Dr. Datey had given me a very short letter of recommendation, which I felt was inadequate but other attendings gave me glowing references. Fortunately, I was accepted but when I reached there, I was most surprised to find that the position was given to me because of Dr. Datey's reference letter whom they knew and respected and not because of long, glowing letters from other attendings. Before I left India, I got married to Kanta. At the Institute I worked under many famous cardiologists including Drs. Peter Harris (who was the Director of the Institute), Wallace Brigden, Jane Somerville, Lawson McDonald, Edgar Sowton, Richard Emmanuel and Audrey Leatham. They were superb clinical cardiologists. After completing my Fellowship, I decided to stay a little longer in England because Kanta was pregnant. I took a position as Senior House Officer and Medical Registrar in Rotherham, Yorkshire, about 100 miles from London where our eldest son, Nitin, was born. Dr. Peter Harris had encouraged me to go to the USA before I went back to Kenya or India to practice cardiology, to learn the latest techniques in cardiology. Since he had co-authored a book on



Figure 3. Dr. Navin C. Nanda and one of the echo sonographers at the University of Alabama Hospital Echo Lab in 1985 demonstrating an Aloka 880

human pulmonary circulation with Dr. Paul Yu in Rochester, New York, I went there and did a Fellowship in Cardiology under him. It was my third cardiology fellowship. I developed an interest in echocardiography through Dr. Raymond Gramiak a radiologist who was the only one performing M-mode echoes in Rochester at that time using a machine provided to him by the Cardiology Division and was a contemporary of Dr. Harvey Feigenbaum in Indianapolis. Only three cardiac valves, mitral, aortic and tricuspid valve could be detected by echo at that time and it was believed the pulmonary valve was inaccessible to ultrasound because it was located under the left lung. To my surprise, I found during some patient autopsies. I had attended that it was not covered by lung tissue especially if the pulmonary artery was dilated and I most excitedly hurried to the Echo Laboratory to try to image it in patients. After working diligently on a few patients both myself and Dr. Gramiak were convinced that we had discovered the pulmonary valve. Subsequently we validated it using indocyanine green dye as a contrast agent in the catheterization laboratory.

This discovery gave me a big impetus and was the turning point of my career. After that I travelled around the country teaching physicians how to find it. Also, I remember Dr. Jamil Tajik who is a good friend, sending a Fellow from Mayo Clinic to our Lab in Rochester, New York to learn the technique of imaging the pulmonary valve by echocardiography. At this point in time, I decided with considerable support and encouragement from Dr. Paul Yu and Dr. Pravin Shah to make a career in echocardiography and to permanently stay in the USA. The discovery of the pulmonary valve heralded the development of pediatric echocardiography since it made it possible to diagnose many congenital cardiac lesions, such as the transposition of the great vessels. During nights I was mainly called by Dr. James Manning, the Chief of Pediatric Cardiology, to perform echoes on cyanotic newborns to diagnose or rule out transposition in an expeditious manner. If transposition was diagnosed, the newborn immediately underwent atrial septostomy. This was a life saving procedure and it gave me great personal satisfaction that I was part of this important team. Around this time, I probably did



Figure 4. Dr. Navin C. Nanda taken about 1983 while he was at the University of Rochester, Rochester, New York USA

more echoes on newborns and pediatric patients than adults. Some other work in congenital heart disease followed such as the first M-mode diagnosis of congenital bicuspid aortic valve and ostium primum atrial septal defect. In adult patients, previous studies had shown a good correlation of decreased mitral E-F slope to the severity of mitral stenosis. I analyzed a large number of patients with mitral stenosis in whom the left atrial pressure was measured directly by the transeptal approach rather than the wedge pressure, which is less accurate and found a very weak and clinically not useful correlation. However, I could not publish this paper because it was felt that this could "kill" the emerging technique of echocardiography. You have to understand that at that time echo had the greatest clinical application in diagnosing and assessing the severity of mitral stenosis, and therefore, proving that echo was not accurate for mitral stenosis severity evaluation could be a big blow to the technique. However, I was able to publish my work as an abstract in the "Clinical Research" Journal but not as a full paper. It would be several years before the Duke Group came out with similar results but by that time echo had become a well-established noninvasive modality.

The discovery of the pulmonary valve also led us to diagnose pulmonary hypertension by echo by assessing the pulmonary valve opening slope and the a dip/wave. I presented this work at an international echo meeting in Rotterdam, The Netherlands. Even though Dr. Gramiak and I worked as a team, the Echo Laboratory was officially under the Department of Radiology. When a new chief of Radiology was appointed, Radiology decided not to support their portion of my salary funding and Dr. Paul Yu had to support me fully from Cardiology funds. This also necessitated having a separate Echo Lab in the Cardiology Division and Dr. Ming C. Hsiung from Taiwan was most helpful in helping me do this, as it had to be started from scratch.

In 1982 or 1983, at a cardiology symposium in New York where I was an invited speaker, I ran into Dr. Gerald Pohost who had just been appointed Chief of Cardiology at the University of Alabama at Birmingham (UAB). Around this time, I had gone to Taiwan for an international cardiology meeting and I was shown a color Doppler machine which was only a prototype and not yet fully developed. I was very much impressed and excited by this new development, which I thought would revolutionize echocardiography. Dr. Paul Yu told me he had no funds to buy what would be a very expensive echo machine. When I subsequently met Dr. Pohost and Dr. John Kirklin, who was a very famous cardiac surgeon and pioneer, and was asked what it would take to make me move to Birmingham from Rochester, I immediately said 2 color Doppler machines, thinking they may agree for one. The answer was "no problem" and I had two color Doppler machines. That is how I moved to Birmingham. In my excitement, I forgot to ask my salary which upset Kanta we had three children to support) but it all worked out and the salary offered was much higher than Rochester. When the color Doppler machines arrived, all the instructions were in Japanese and I did not know how to use them. Dr. Kasai, an engineer, and Dr. Ryozo Omoto were to arrive the following week from Japan, but meanwhile Dr. Kirklin had a very high ranking military officer from South America with a previous mechanical aortic valve replacement who had become symptomatic and had a loud murmur of mitral regurgitation. Since retrograde catheterization could not be done on this patient and he was not keen to perform an apical puncture, he called me to do a color Doppler study to confirm the presence of severe mitral incompetence. He said "we got you an expensive toy", Let us see how good it is. We somehow turned on one of the machines and I remember printing sheets of paper colored blue, red and green but I had no clue what we were looking at. I took all to him and before I could open my mouth, he exclaimed "that looks like severe regurgitation, thank you so much for doing this". I was dumbfounded and that night I am sure I slept worse than the General but severe regurgitation was found at surgery and the mitral valve replaced. We told the Japanese to take the next flight and they obliged and showed us how to work the machine. Several publications on color Doppler ensued with the help of Cardiology Fellows in Birmingham and also Fellows from India who came to learn this modality which was introduced in the USA for the first time in our Echo Lab. The technique spread very rapidly not only in the USA but throughout the world.



Figure 5. Dr. Nanda as an intern at King Edward Memorial Hospital, Bombay, India. He is 3rd row from the front stand and 3rd from the left



Figure 6. Dr. Navin C. Nanda (middle) receiving the Tufts University Award in Echocardiography for "pioneering work as well as education contributions", May 1985. Dr. Nanda was the first recipient of this prestigious award

Dear Professor, one of the documents I acquired from your administrative assistant, Lindy Chapman, was about the "firsts" that you had contributed to echocardiography. This long list which is beginning with the first detection of pulmonary valve by echocardiography, continuing with the first evaluation of right ventricular infarction by echo, development of treadmill exercise echocardiography and criteria for evaluation of valvular regurgitant flows by color Doppler and ending (just for now) with 3D echo, is more than 10 pages long. Your studies were crowned with many awards including the 2010 International Service Award given by the American College of Cardiology for your great contributions to cardiology throughout the world, the 2006 Ellis Island Medal of Honor for outstanding contributions to the USA, Andreas R. Grüntzig Award which is the most prestigious award of Europe given by the Swiss Society of Cardiology, and another recognizing you as a "legend in his own time" "whose contributions have significantly altered the way cardiology and cardiac surgery are practiced in the world today" given by the Chinese Society of Ultrasound in Medicine and the Brazilian Society of Cardiology respectively, an award naming you "Echocardiographer of the Millennium" by the Government of the United Arab Emirates and the Emirates Society of Cardiology for your pioneering lifetime contributions to the advancement of cardiology, a Special Award given by the Government of Egypt for your pioneering contributions in echocardiography and for promoting the growth of ultrasound throughout the world, the "Prince of Echocardiography" award given by Italian Society of Echocardiography, a Special Award and Honor from the Uruguayan Society of Cardiology in recognition as a "Most Outstanding and Distinguished Teacher and Pioneer in the Field of Echocardiography", and your appointment at UAB as Distinguished Professor of Medicine and Cardiovascular Disease last year (the first recipient, I understand, was the famous Prof. Tinsley Harrison whose book is considered a bible in Internal Medicine). I know all these awards and "firsts" are very valuable to you but if I were to ask you to choose one of them which one would it be?

It is very difficult to choose but I believe the Awards, which recognize some of the contributions I made in echocardiography are most cherished by me. Through the World Congresses of Echocardiography, teaching and popularizing echocardiography around the world is also very important for me.

Despite all these firsts, these awards, and your love for education, your name is not mentioned in the brief historical account part of Harvey Feigenbaum's Echocardiography book. Is there a special reason for this?

I have the highest respect for Dr. Feigenbaum and we are very good friends. As you say, the account is brief and not inclusive and that may be the reason. Also, every one tends to have a good memory of persons you have closely worked with and I never worked under him. However, the publications are there for anyone to see.

The semiquantitative criteria for grading regurgitant flows that we use now are coming from your studies, right?

Yes.

Had you thought at that time that 3-D echo could exist?

I did not only think of it, I worked on developing 3-D echo even when I was in Rochester and published our results.

What is the role of your wife who opened the doors of the world, in your becoming a renowned cardiologist?

My wife, Kanta, has always been my supporter, has encouraged me all the time and has been more vocal than I in publicizing whatever small contributions I have made in the field of echocardiography. She also gave up the practice of medicine to be able to spend more time with our three children so I could devote more time to echocardiography.

Why are you always preoccupied with innovations and firsts? You have been a pioneer, would it be not easier to assimilate existing knowledge and continue life like this?

Certainly, that would be easier, but new developments and innovative approaches keep me interested and "alive", I don't get bored, it makes me happy to learn a new thing every day instead of simply repeating what I know.

Do you think 3-D would replace 2-D or will it remain complementary as it is now?

In a few years, when its quality improves 3-D will replace 2-D. Even now in certain clinical situations 3-D examinations are more valuable than 2-D.

Dear Professor, thank you for sharing your history of medical life in an honest manner with us. It would be a classical question but what do you think are the milestones in this story and who are your role models?

My mother's unwavering insistence I go to India for medical studies, Drs. K.K. Datey and Ivan Pinto's training me in research, Dr. Peter Harris' advice I go to the USA for further training in cardiology, Dr. Paul Yu's fatherly advice and many kindnesses,

mentorship from Dr. Raymond Gramiak and Dr. Pravin Shah, Dr. John Kirklin's support, Dr. Gerald Pohost's friendship and my wife, Dr. Kanta Nanda's encouragement in difficult times and sacrifices she made for me, and of course my assistant, Lindy Chapman. Apart from this, I have been blessed to have the friendship and support of my colleagues, Fellows and students in the USA and abroad.

These days you seem to be working more intensely than before. While on one hand you conduct routine work at The Kirklin Clinic and University of Alabama Hospital, on the other hand, you continue educating cardiologists and echocardiographers from all over the world through your unique Preceptorship Program. Furthermore, you continue to publish a large number of clinical research papers every year and actively participate as a speaker in national and international congresses. You have also published many books including one on 3-D echo, you currently lead the International Society of Cardiovascular Ultrasound as its President and organize World Congresses on Echocardiography and Allied Techniques every year in a different country of the world and you are also the Editor-in-Chief of the Echocardiography Journal. As if these are not enough, you are often on call at UAB one week in a month. How do you find time for all of these?

If you have the interest, you also find the time, Gültekin.

I will ask a question related to those interested in cardiology. You are one of the founders and the chief editor of the prestigious Echocardiography Journal. I see that you give place to Turkish researchers in your journal as well.

Are there special sensitivities regarding publications in your journal? Can you give some tips to the cardiologist who will read this interview?

English is a major problem in many of the manuscripts we receive from abroad. It is important that each paper is first corrected by someone who is very well versed in English. This makes it easier for the reviewers to understand the content so they can evaluate the manuscript in a fair manner.

Is there anything which is generally accepted but you feel it is not true or something that you feel is true but not universally accepted?

Off hand, I cannot think of anything.

I would like to move on to the quick questions and answers part of the interview. I would appreciate it if you respond with the first thing that comes to your mind.

Ok.

RV evaluation: 3D echo or cardiac MRI?

3D echo.

Where would you like to have lived beside U.S.?

In Kenya, but the Kenya of my childhood.



Figure 7. Interview

Red or blue?

Blue. Blue is peaceful, but if red and blue represent the difference between reality and dream, then reality, so red.

If you had not become a doctor, what would you be?

Probably a historian or teacher.

If you were not a cardiologist, which branch would you have chosen?

Probably dermatology, ophthalmology or allergy and immunology (2 of my 3 children have chosen this specialty). You do not get many calls in the night.

Is it the "gözleme" in Capadocia or the fish at the Bosphorus?

The gözleme anywhere.

"Baklava" or "künefe" ?

"Baklava".

But the dessert we had in Mardin was künefe.

Then definitely "künefe", that desert was out of this world.

Turkish people and Turkey?

Friendly, family-oriented, sincere. Turkey is a very beautiful country. It is a mixture of the East and the West. It has snowy mountains as well as sunny beaches. It has both historical and natural beauties, it has hospitable people who value others, the only problem is the language. If Turkish was not such a difficult language, I could have answered the question of what would be my second home as Turkey instead of Kenya.

Dear Profesor, I'd like to thank you for this wonderful interview on behalf of our journal.

Gültekin Karakuş

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