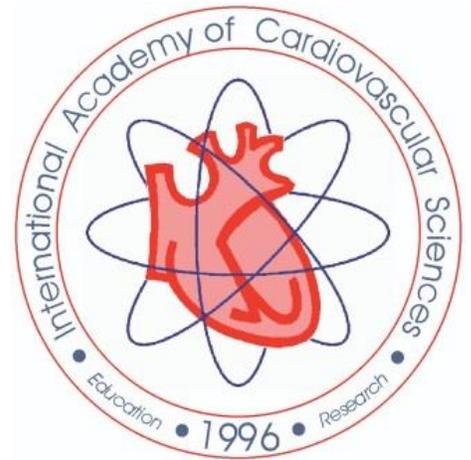


Promoting Cardiovascular Education, Research and Prevention

CV Network

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In this Issue

Page

- 2 You Young Scientists – History is a Friend, Philosopher and Guide
- 5 2017 Medal of Merit – Call for Nominations
- 6 Dr. Dhalla's Professional Journey
- 12 Three Fables as 2017 Best Wishes
- 13 Poem: Soul Survives Moves On and On
- 14 Tribute to Dr. Ben McNamara on his 75th Birthday
- 16 CV Network Editorial Board
- 17 Distinguished Scientists Honored in New Delhi, India
- 22 Call for Applications for IACS Fellowships
- 23 Global Health Champion Award and Opening of Cardiac Intensive Care Unit in Jamaica
- 24 CCHHE 2nd Gala Dinner in honor of Dr. Henry Steward, Winnipeg
- 25 Report: IACS India Section Meeting, February 9-11, 2017
- 35 Life Style and Life Style Diseases
- 37 What is New in Strategies for Cardiac Regeneration?
- 39 Ethnicity as a Major Determinant of Cardiovascular Health
- 41 Current Trends in Cardiovascular Research in India
- 43 Argentina/Brazil Postdoctoral Meeting, Buenos Aires, Argentina
- 44 5th IACS North American Section Meeting, Orlando, USA
- 45 4th IACS European Section Meeting, Pecs, Hungary
- 46 IACS South America 27th Scientific Forum, Campo Grande, Brazil

You Young Scientists - History is a Friend, Philosopher and Guide

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(This article is based on the Prof. Ramesh Goyal Oration Award Lecture at the IACS-India Section Meeting on February 10, 2017 at the VP Chest Institute, New Delhi)

'If I have seen further than others, it is by standing upon the shoulders of giants'

Isaac Newton

'One never notices what has been done, one can only see, what remains to be done'

Marie Curie

Success in science, or for that matter, in any facet of life, is most often incremental. Inevitably the monuments of success are built on the rubble of failure of quite a few, so that the *deja vu* and the ecstasy of success always has its flip side and that is the travails of those who couldn't make it that far. Nevertheless the failures have their singular and significant contribution to the success of the subsequent efforts. The entire science is replete in its history of such instances.

Prof. Jennifer Cunningham once said, "In order to understand where we are now and where we are going, we must first understand where we have been". History helps us, moulds us and is a part of us and dreams of tomorrow start with learning of the past. In fact, history can be a great teacher and a source of wisdom. History teaches us the qualities which make 'great men great'. A peep into the origin and development of cardiac sciences serves as a prototype to learn and study how these ecstasies and travails panned out and look at the qualities that one need to possess or develop to convert, at least some of these travails, into ecstasy of success (Ref Fig.1 & 2). This model is applicable to all facets of science and humanity. Whether destiny is decided by 'God' or 'Self' can be debated, but certainly there is no argument that this destiny can at least be modified, and given the right direction, by one's own self. The qualities of inquisitiveness, observation, open mindedness, teamwork, gumption, ingenuity, courage of conviction and perseverance, to name a few, help carve ones destiny and turn the tilt from the pains of failure and unfulfillment towards the joy of making a successful and meaningful human being.

The pre-historic man had no concept of heart and circulation, but did have an inkling, from wisdom of experience, that for a quick kill the spear point should be



Figure 1



Figure 2

directed towards the centre of the chest, as demonstrated by magnificent polychrome frescoes, found in the caves of Pudal in Altamira, Spain, of stone age animals with heart drawn in red ochre. Even in our ancient text, Brahdarankopanishad (1600 BC), the word 'Hridaya' has been used, where "Hri" stands for 'to imbibe air and other substances', "Da"- 'to deliver air and other substances', and "Ya" - 'to give nutrition'. I doubt if there could be a

better functional definition for heart and circulation, and all from astute observation and common sense - traits which are incalculable, freely and readily available and applicable in any scenario in real life. However, the reality is that they are hardly ever put to optimum use, if put to use at all.

In the Greco-Roman era (131-201AD), Galen working as surgeon to the gladiators, again by sheer observation of the blood flowing in ebb and tide in the drains of the colosseum, from the gladiators wounded during fights and left to die, deduced that there must be some sort of a pump and gave the concept of a singer chamber heart. The concept of two chamber heart was given by Leonardo da Vinci (1452-1519) based on a series of thirty autopsies and 800 drawings and published as 'Quadrati Anatomica'. But the church and papal issued a decree, which barred Leonardo from doing any further autopsies, and that gave Harvey to elucidate the nature of circulation hundred years later. The closed mindedness of the church therefore retarded the progress of science, and thereby hindered in the welfare of humanity. Literature is replete with similar examples underscoring the point that one must be receptive to new ideas and thoughts rather than being seeped in dogma, more in pursuit of turf protection.

It is not always that the uninitiated and the masses have a clouded thinking, but even the greatest of great can falter. Hippocrates once prophesied, 'All wounds of the heart are fatal' and Fallopius in the 16th century said, 'The heart could never heal as it is too hard, always in motion and often of an inflammatory heat'. Even as late as 1896, Paget said, 'Surgery of the heart has probably reached the limits set by the nature to all surgeries. No new method and no new discovery can overcome the natural difficulties that attend a wound of the heart'. How far removed from the truth and reality were these great men! To the contrary, using the power of keen observation, Cabrol in Montpellier (1604) noticed scar in the hearts of 2 dogs during autopsy and using that uncanny, erroneously named trait called common-sense, deduced and demonstrated the ability of the heart to heal and repair itself, thus paving the way for development of the field of cardiac surgery.

However it was in the late 19th century that Bloch demonstrated the feasibility of suturing heart muscles in rabbits, thereby demonstrating initiative and dare, against the existing dogma. But then Bloch also brought another attribute into focus and that is lack of mental strength and fallibility which brought so much agony to him personally. He operated on his niece and did a pneumonectomy, presumably for the diagnosis of destroyed lung due to tuberculosis. Unfortunately, his niece died through post-operative complications and subsequent histopathology showed no evidence of

tuberculosis. Bloch went into depression and committed suicide out of a feeling of guilt. This demonstrates that every coin has two facets and all of us are human and prone to moments of weaknesses interspersed with times of glory and ecstasy. It is in these moments where hand holding and a little encouragement may work wonders. In fact, the legendary Dwight Harken stopped operating after he lost six out of his first ten patients undergoing closed Mitral Valvotomy, when he was brought back to the operating room by his cardiologist, Lawrence Ellis, who walked over to Harken and said, 'You have never killed anybody. I have never sent you a patient who was not dying', thereby demonstrating the value of leadership and team work. It's the same Dwight Harken, who went on to operate on 134 battle field missile injuries of the heart with zero mortality in the battle arena of World War II.

"Life is like a see-saw ride, full of ups and downs. But when you are down, a good friend will jump on the other seat to bring you back up again".

One can never progress unless one innovates and quest for excellence is a constant evolutionary journey with never an end point. As J.D. Houston puts it, "If you want something in your life, you've never had, you'll have to do something, you've never done". Charles Bailey presents one such example of epitome in innovations. He strapped a curved blade to his index finger using a rubber band and inserted the finger into the left ventricle to do blind mitral valvotomies. (Refer Fig.3) So incensed was the establishment of the day, that three out of five hospitals in Philadelphia cancelled his license and the other two put him on a warning. However Bailey was so focused that he posted a morning case at Philadelphia General Hospital and an afternoon case at Episcopal

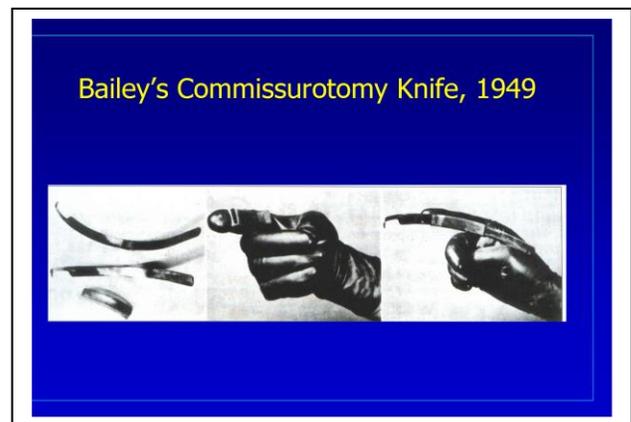


Figure 3

Hospital and told his anaesthetist that if he lost the morning case, he should not declare the patient dead till such time that he put his knife on the afternoon case. As the luck would be, he did lose the morning case, but then he rushed straight to the Episcopal Hospital and put his

knife down, before the authorities had time to cancel his license. Lo and behold, the patient lived 37 years to die of pneumonia! Besides innovation, this highlights the courage of conviction, which is required and integral to making it big in life.

We have all grown up with the parable of an old man, on his death bed, trying to imbue in his sparring sons, the value and strength of unity by giving them individual sticks to break and then as a conjoint bundle. History reinforces and stands testimony to the merits and value of team work and one of the biggest examples of partnership has been the development of BT Shunt in Cardiac Surgery. Helen Taussig, a Cardiologist at John Hopkins suggested to Blalock, her cardiac surgeon, 'The truly great day will be when you build a ductus for a child dying of anoxaemia and not when you tie a ductus for a child with a little too much blood going to his lungs'. Taking cue from it, Blalock created a shunt operation for palliation of cyanotic congenital heart ailments, aptly called the 'Blalock - Taussig' shunt.

It is also important that we show-case ourselves and our work and the case in point again is the BT shunt. Blalock performed BT shunt in St. Guy's Hospital in London, first time in Europe, in 1942. Thereafter the patient was show-cased to the audience with all theatrical inputs at the Great Hall of British Medical Association. At the end of his lecture, the lights went out with pitch darkness in the hall, which the audience attributed to power failure, so very common in those war ravaged times. Just then, came a piercing beam of search light from the rear of the hall and focusing on a nurse, in blue uniform of St. Guy's Hospital, holding the hand of a cute little child of Tetralogy of Fallot, now pink after the BT shunt performed a few days earlier. There was spontaneous tumultuous applause and a standing ovation, and arguably this showmanship changed the course of cardiac surgery in entire Europe.

Perseverance is another important attribute one should aim for. The first pacemaker was implanted by Senning in 1959 and it required 24 attempts of implantation, explantation and re-implantation before it succeeded! Story goes that a young man developed complete heart block and was surviving on a temporary pacemaker. Obviously he could not go on for eternity on a temporary pacemaker, so his wife was advised that one Dr.Senning was working on developing an implantable device and she could check on him for help. She went over to the house of Dr.Senning pleading for him to bail out her husband. Senning declined as he felt his gadget had not evolved sufficiently to be used clinically. However, he could not sleep that night and some how miniaturized the circuit, emptied a "Cherry Blossom" shoe polish tin and fitted the circuit in. Next day he implanted the device successfully

with all pomp and show. Alas it stopped working within 24 hours due to seepage of serum & body fluids inside the tin causing a short circuit. The gadget was taken out & this time round Senning sealed it with wax at the rims & re-implanted the device successfully. Again a glitch and the story goes on and on till it was finally brought to fruition in 24 attempts – a glaring example of perseverance launching one to pinnacle of glory.

Never say die attitude, yet another important attribute for true greatness, was so very clearly exemplified by the father of modern cardiac surgery, Clarence Walton Lillehei who was diagnosed with lymphosarcoma of the Parotid gland, one day after he finished his residency. He had Parotidectomy with radical neck resection of lymph nodes, and radiotherapy and went on, to not only conquer his illness, but also the world, by his exploits in cardiac surgery. But then to err is human, and though a creative genius he was, he too was human and led a reckless life leading to his conviction for tax evasion and a jail term. It was only to save the face of the medical fraternity that it was converted to a suspended jail term by the American Senate. This clearly brings to focus that such trivialised matters as greed, ego and morals are extremely important and relevant even in the fields of Science and Medicine, may be even more so.

Just as great partnerships between Starr and Edwards; Medtronic and Hall; Lillehei and Castor have brought huge benefits to the society, rivalries can have bipartisan outcomes. The one between Lillehei in Minnesota and Kirklin at Mayo was mutually productive but between Michael DeBakey and Denton Cooley was acrimonious. However, healthy competition is needed to bring out the best and one should never suppress it. Denton Cooley, after finishing his senior residency with Blalock at John Hopkins and having done a couple of aortic aneurysm surgeries there, went on to work as a resident to DeBakey at the Baylor. At the suggestion of Cooley, DeBakey did the first aortic aneurysm repair in 1951 and willfully claimed it as the world's first without acknowledging that Cooley had done such cases earlier and that it was Cooley who had suggested the idea and plan of the surgery. This incident hurt the ego of Denton Cooley and he moved on to establish his own heart centre and blazed a trail of glory, as never before, but unfortunately culminating in his own censure by the American College of Surgeons for reasons of 'stealing the design' of Ventricular Assist Device from DeBakey, of 'unethical use of media' for 'personal glory' during this first use of the Ventricular Assist Device in the world and multiple other counts. So in the quest of personal glory and ego, he left much to be desired of the morals. That's an element which certainly cannot be ignored as he brought untold damage to the entire medical profession, just as when he brought humongous benefits to humanity through his techniques

and skills. But then, we also have the greats like Lower and Shumway, who at Stanford evolved and developed the techniques of heart transplantation. Even on being warned that Christian Barnard, who trained under them at Stanford and then went on to Cape Town in South Africa to do the first heart transplant in the world on the 3rd of December 1967, was ready to do a transplant, they did not shudder from the ordained path on sheer moral grounds, that they had to perfect the technique a little more before they tried it on a human being. They, never even for a moment, thought in terms of making a personal mark or milestone in the world – indeed a sign of the highest degree of evolution. Though we exhort our youngsters to develop out-of-box thinking, but in reality, even ideas have to be in synch with the times, lest one suffers. But that should not shudder a true scientist and one must remain focussed on the job at hand, caring least for the consequences, as was demonstrated by Hamilton Naki, the black man who harvested the heart from Denise Darvall for the first Heart Transplant in 1967 in then apartheid ridden South Africa, and then faced a possible conviction for the criminal offence of cutting white meat and shedding white blood. Though all glory was cornered by Christian Barnard, Hamilton Naki remained an unsung hero but never made an effort to be counted, and today we remember and commemorate him as a shining example of selfless service.

The history thus bears testimony to the fact that there are no bigger names than the Blochs, Harkens, DeBakeys, Cooleys, Barnards and Lilleheis in Cardiac Surgery and yet were they super humans? Wasn't Block fallible and weak? Didn't Harken need hand holding lest he would have crumbled and broken down? Wasn't DeBakey an egoist? Did Cooley not cheat in pursuit of his ulterior motives and goals? Wasn't Barnard unethical in

performing the first heart transplant and Didn't Lillehei, unarguably the 'Father of Modern Cardiac Surgery', leave much to be desired of his morals? So to achieve true greatness, one must guard against the lust for name and fame or greed and ego leading to rivalry and competition. All these define the travails that many stalwarts went through, but to the flip side, all these giants also demonstrated such qualities as sense of inquiry, astute observation, unwavering focus, never-say-die attitude, collaboration, common sense, leadership, faith and perseverance, which gumption would tell, are qualities not that freely demonstrated, but which bring the ecstasy involved in the making of a true legend.

Francis Drake once said, 'O Lord God, when thou giveth to thy servants to endeavour any great matter, grant us also to know that it is not the beginning, but the continuing of the same unto the end, until it be thoroughly finished, which yieldth the true glory'. Lord Brock gave his recipe for success and ecstasy, of having new ideas, courage to apply them and lastly the tenacity of purpose to carry on these ideas to fruition.

History thus serves a master class for the young & budding scientists of today to peep into & prepare for the future. They have in them, every single ingredient to be just that next 'Super Star', all they need is courage of conviction. Often the light isn't at the end of the tunnel, it burns within us. Its just a matter of capturing that spark. As for the quest of perfection, there is no perfect being, not even 'God', so don't go on a leather hunt for that elusive chase.

My young Friends, Chase, if you must, your inner calling....and go for it no holds barred!

2017 Medal of Merit – Call for Nominations

The International Academy of Cardiovascular Sciences requests Nominations/Applications for the Award of 2017 Medal of Merit. This highest honour of the Academy will be bestowed upon an individual who has made original research discoveries that clearly stand on their own or for contributing important educational services that have influenced how cardiovascular science is learned and practiced. The previous 33 Medal of Merit Recipients are listed in past issues of CV Network

(www.heartacademy.org). Six recent recipients are: Laurentiu M. Popescu, Romania; Makoto Nagano, Japan; Roberto Bolli, USA; Francois Abboud, USA; Valentin Fuster, USA; Otoni M. Gomes, Brazil. A two page summary of achievements along with a complete bibliography and two references should be sent by May 30, 2017 to Dr. N.S. Dhalla, Executive Director, IACS, St Boniface Hospital Albrechtsen Research Center, Winnipeg, Canada (email:nsdhalla@sbrc.ca).

My Professional Journey

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Learning and Training Experience



Naranjan Dhalla in 1987 when he moved from the University of Manitoba Health Sciences Centre to the St. Boniface Hospital in Winnipeg

Naranjan S. Dhalla was born in October, 1936, in Ghanieke Bangar, near Batala, Punjab, India and was raised by very loving, caring and generous parents. After receiving BSc degree from the Panjab University, I was introduced to the Department of Pharmacology, Lady Hardinge Medical College in New Delhi where I worked as a Chemist/Research Assistant and then Assistant Research Officer with Prof. Chaman Lal Malhotra effective 1957. At that time, Dr. Malhotra was interested in discovering

some pharmacologically active ingredients of different medicinal plants such as Herpestis, Monniera (Brahmi Booti) and Withania Somnifera (Ashwaganda), which were used in the Ayurvedic System of Medicine for the treatment of a wide variety of diseases of the nervous system and cardiovascular system, respectively. In collaboration with a highly experienced chemist, Dr. M.S. Sastry, I was successful in isolating a relatively pure compound, heraponin, from Herpestis Monniera, as well as isolating a total alkaloid preparation from Withania Ashwaganada. Although we were also able to separate several compounds from the total alkaloid preparation, we did not pursue this chemistry project further because I became much more fascinated for studying the effects of the crude extract of Herpestis Monniera and hersaponin, as well as the crude extracts of Withania Ashwagandha and the total alkaloid preparation. This provided me with an extraordinary experience to learn a wide variety of pharmacological techniques from a brilliant investigator, Dr. Prasun K. Das, who was also working with Prof. C.L. Malhotra as a senior lecturer at that time. My work in the areas of cardiovascular pharmacology, neuropharmacology and smooth muscle pharmacology

during four and a half years of stay at the Lady Hardinge Medical College resulted in the publication of 20 full length papers in refereed journals.

While working with Prof. C.L. Malhotra and Dr. P.K. Das (who later became a Professor of Pharmacology at the Banaras Hindu University, not only did I learn the art of carrying pharmacological experiments but also developed skills for the analysis of literature, as well as writing research papers. Dr. Das was a perfectionist whereas Prof. Malhotra was a man of great ethics, and thus my close interaction with them helped me to understand the importance of scientific integrity and honest approach to finding solutions to diverse problems in the field of medical research. During a visit of Prof. Prem Chand Dandiya, an extraordinary pharmacologist from the Jaipur Medical College, I had a unique opportunity of discussing my research work with him. His remarks were truly inspiring and he encouraged me to receive formal education in Pharmacology from a well-recognized institution outside India. In fact, he recommended me for undertaking graduate studies in the Department of Pharmacology at the University of Toronto in Canada. Although I received admission with appropriate fellowship for studying Pharmacology at the University of Toronto, I did not join that institution because their letter of acceptance was received one day later than that from the University of Pennsylvania, in Philadelphia or perhaps I was destined to study in USA. Nonetheless, I have always been grateful to Prof. P.C. Dandiya for identifying me as a potential student of Pharmacology and indeed, he has been a source of inspiration throughout my professional career.

I joined the Department of Pharmacology, School of Medicine, University of Pennsylvania, Philadelphia as a graduate student in September, 1961. This Department was chaired by a world-renowned pharmacologist, Dr. George B. Koelle, who discovered the presence of acetylcholine esterase in the neuromuscular junction. He was a great human being and showed keen interest in the development of my professional career. I worked under



Naranjan Dhalla in 1957 when he joined the Department of Pharmacology, Lady Hardinge Medical College, New Delhi

the supervision of Dr. Niels Haugaard, who was a pioneer in the field of Biochemical Pharmacology. My research involved studies on the role of phosphorylase enzyme in atrial and ventricular function. I also interacted with several other faculty members, who were carrying out highly active research programs in diverse fields of pharmacology in this Department and were also leading scientists in the area of their investigations. Thus I had a great experience and exposure for learning different approaches

to examine the pharmacologic actions of several agents at the cellular and biochemical levels. A thorough and careful reading of the book "The Pharmacological Basis of Therapeutics" by Louis S. Goodman and Alfred Gilman helped me to understand the significance of drug therapy for the treatment of human disease. However, in my search to expand the scope of my knowledge, I had an opportunity to meet Dr. Paul L. McLain, a highly accomplished teacher of pharmacology from the University of Pittsburgh, at a conference of the Federation of American Societies for Experimental Biology in Atlantic City. I was impressed by his philosophy for blending both teaching and research in the development of a well-rounded investigative pharmacologist and thus I accepted his invitation to study cardiovascular pharmacology under his guidance after completing my MS degree at the University of Pennsylvania in 1963.

During my studies towards PhD degree at the Department of Pharmacology, School of Medicine, University of Pittsburgh, Dr. P.L. McLain showed a great deal of confidence in me for achieving my potential to become an independent investigator. He provided me with excellent opportunities to carry out experiments for studying the relationship between changes in phosphorylase activity and cardiac function due to different inotropic interventions. I was also encouraged to learn the art of collaborating with several investigators both within the University and at other institutions. This enabled me to appreciate the role of the sympathetic nervous system in modulating the function of cardiovascular system. I was also impressed by Dr. Joseph Buckley, who was Chairman of the Department of Pharmacology in the School of Pharmacy and was engaged in studying the role of central nervous system in inducing hypertension due to angiotensin II. In addition, I was engaged in demonstrating both in vivo and in vitro pharmacology experiments to medical students. The departmental staff was so satisfied with my commitment for teaching, as

well as my interaction with students, that I was appointed as instructor upon completion of my PhD degree in 1965 and was given my own laboratory for carrying out research in the area of cardiac pharmacology.

As a requirement for both MS and PhD degrees, I undertook a wide variety of courses which helped me to build a strong base for understanding the importance of multidisciplinary approaches for conducting experiments in the areas of cardiovascular physiology, pharmacology, biochemistry, pathology and therapeutics. While I was busy in initiating a new program for investigating pharmacology of heart disease at the University of Pittsburgh, I had an opportunity of discussing my academic background, progress and plans to carry out research with a well-known but very humble scientist, namely Dr. Julius Axelrod, who later on received the Noble Prize. Although he appreciated my enthusiasm for undertaking new challenges, he advised me that I should receive further training in the field of myocardial metabolism in order to understand the mechanisms and rationale for the therapy of heart disease. Accordingly, I moved to the Biochemistry Department at the School of Medicine, University of St. Louis to work under the guidance of Dr. Robert E. Olson, who was very famous for his work in the field of energy production and energy utilization in the myocardium. He asked me to start investigating the role of endogenous lipid and glycogen stores in cardiac function and learn to develop fluorescent technique for monitoring the energy status of the beating heart.

In view of my work habits, research productivity and ability to interact with other staff and faculty members, Dr. Robert Olson considered me suitable for promotion within 9 months of joining his research team. He had me appointed as Assistant Professor in the Department of Pharmacology and provided me a fully equipped cardiovascular laboratory for collaborative research work in the Department of Biochemistry. There were more than 30 faculty members in his department and I was one of the five faculty members who were carrying out research in close association with Dr. R. E. Olson. Although I was encouraged to obtain my own grants for independent research work, sufficient funds were made available to me for carrying out collaborative projects. I carried out extensive work for studying the relationship among metabolic, ultrastructural and contractile changes in the heart upon perfusion with substrate-free medium as well as with hypoxic medium. This research during my postdoctoral training as well as during my graduate studies was published in the form of 23 full-length papers over a period of 7 years (1961-1968). It was in St. Louis that I made seminal observations that there occur defects in membrane Ca^{2+} -transport in heart failure due to substrate-lack. There is no question in my mind when I

say that Drs. George Koelle, Neils Haugaard, Paul McLain and Robert Olson had a profound impact on my professional development and I will always be indebted for their kindness as well as the opportunities they provided during my stay in their institutions.

Academic and Research Achievements



Naranjan Dhalla in 1966 when he was appointed as Assistant Professor of Pharmacology at the St. Louis School of Medicine in St. Louis

During the visit of Dr. George Koelle (University of Pennsylvania) for delivering a special lecture in the School of Medicine at the St. Louis University, I discussed my career development, work performance and future research plans with him. While he was very much satisfied and impressed with my progress, he felt that I needed more independence for conducting my research activities and I needed a permanent faculty position to achieve my full potential as an investigator. He recommended me for appointment in a high

profile Department of Pharmacology, Faculty of Medicine, at the University of Manitoba in Winnipeg, Canada. Since this department had no vacancy for a faculty position at that time, the information regarding my credentials was passed on to the Department of Physiology which under the leadership of Dr. Arnold Naimark was in a process of building a strong base in the area of biochemical and molecular medicine. Dr. A. Naimark recognized my talents and offered me a position as Assistant Professor in his department for initiating the cardiovascular research and building a graduate training program. He provided me full freedom, adequate resources and excellent facilities for developing my own research activities. Shortly after my move to Winnipeg in August, 1968, I was successful in assembling a team of several graduate students and technical staff to help me launch a highly active and functional research program. My research projects were funded by different provincial and national granting agencies and I developed excellent relationships with my faculty colleagues. Since I had a minimal load for teaching medical students, I was able to direct my efforts for developing a strong graduate training program. I progressed through academic ranks and was promoted to the position of Professor of Physiology in July, 1974. By this time, Dr. Arnold Naimark became the Dean of Medicine but he continued giving his unconditional support to develop my investigative career. I must say that I was a very popular Sikh but I took off my turban in 1971 when I decided to make Canada as my

permanent home. Nonetheless, I am truly proud of my Indian heritage and be a person of Punjabi origin.

The Faculty of Medicine was fortunate when a highly reputed scientist in the field of endocrinology in the name of Dr. Henry G. Friesen joined the Department of Physiology as Professor and Head in 1973. Dr. Friesen was an exceptional man of great vision and high commitment for moving frontiers of medical research. Not only was he a source of inspiration for me but he also encouraged me to undertake further challenges to develop cardiovascular science. I also became close to a truly noble cardiologist, Dr. Robert E. Beamish, who was working as Vice-President of the Great West Life Insurance Company in Winnipeg. In addition to serving as my spiritual advisor, he helped me to obtain a substantial amount of funds from the private sector for initiating a collaborative research program in the area of pathophysiology and pharmacology of stress-induced disease. I was able to develop cordial relationships with several faculty members of the Department of Pharmacology including Drs. Peter Dresel, Ian Innes, Ivan Bihler and Frank LaBella but I only carried out collaborative research with Dr. Ian Innes. I have always considered that the support as well as the friendship of individuals such as Arnold Naimark, Henry Friesen and Robert Beamish have helped me to succeed in my professional career. In fact, in view of the impact of my research work as well as the development of my national and international profile, the first Centre of Excellence in Heart Research in Canada was established under my direction in Winnipeg by the Medical Research Council of Canada in 1978. It provided me the opportunity to recruit 5 faculty members to build a highly viable research program in the area of heart disease at the Faculty of Medicine, University of Manitoba.

By employing different experimental models of heart disease including genetic cardiomyopathy, catecholamine cardiomyopathy, infective cardiomyopathy, diabetic cardiomyopathy and ischemic cardiomyopathy, I identified varying degrees of defects in various organelles such as sarcolemma, sarcoplasmic reticulum, mitochondria and myofibrils during the development of cardiac abnormalities. This research work helped me to establish the role of subcellular remodeling in the genesis of heart failure and formulate a novel concept regarding the subcellular and molecular basis of cardiac dysfunction. I also carried out extensive investigations on the mechanisms of action for several cardioactive drugs on subcellular organelles both under in vitro and in vivo conditions. I made some efforts to understand mechanisms of the transition from cardiac hypertrophy to heart failure by inducing pressure overload as well as volume overload in experimental animals. I carried out different studies to reveal the role of oxidative stress and

intracellular Ca^{2+} -overload as well as changes in cardiac gene expression and protease activation in inducing the ischemia-reperfusion injury and associated ischemic heart disease. My laboratory was first to demonstrate the presence of Ca^{2+} - Mg^{2+} ecto-ATPase in cardiac cell membrane and suggested its function in eliciting the occurrence of intracellular Ca^{2+} -overload in heart disease. In addition, I showed the involvement of oxidation products of catecholamines in the development of cardiac dysfunction, myocardial cell damage and cardiac arrhythmias due to stress-induced heart disease. Some selected review articles and original research papers published from my laboratory are given in Tables 1 and 2 to indicate the quality, type, strength and magnitude of my research efforts.

Over the past 55 years, I was able to publish 794 full length articles (617 research papers in refereed journals and 177 papers in books and monographs) as well as 619 abstracts. According to the Google Scholar Analysis, this work has been cited 22,637 times with h-factor of 71. I also had a unique opportunity to give 349 symposia talks at various national and international conferences on the pathogenesis and therapeutics of heart disease. In addition, I was invited to deliver 146 lectures at different institutions throughout the world. I have trained 59 MSc and PhD students as well as 50 postdoctoral fellows in the field of experimental cardiology. I also worked closely with 37 visiting scientists from all over the world, who carried out research work in my laboratory. In view of my extensive record of research contributions and evidence of high profile training program, I was appointed as Distinguished Professor at the University of Manitoba in 1991 and the Naranjan Dhalla Chair in Cardiovascular Sciences was established by the St. Boniface Hospital Research Foundation in 2006. My academic and professional achievements were recognized by 185 honours and awards from various organizations and institutions around the globe. I was inducted into the Order of Canada, Order of Manitoba, and Fellowship in the Royal Society of Canada. I was awarded MD (Hon) from the Charles University in Prague and DSc (Hon) from 5 institutions including Slovak Academy of Sciences (Bratislava), Panjab University (Chandigarh), Guru Nanak Dev University (Amritsar), University of Kragujevac (Serbia) and University of Buenos Aires (Argentina). In addition, I received Honorary Professorships from 4 different universities.

Professional Services and Development

I devoted a considerable amount of time for promoting medical science and developing several organizations while carrying out diverse research projects and heavy engagement in the graduate program. I served as Founding Director of the Institute of Cardiovascular

Sciences (formerly known as the Division of Cardiovascular Sciences) at the St. Boniface Hospital Research Centre for 19 years during 1987-2006. I recruited several highly talented investigators for building a multidisciplinary program in research and education in Winnipeg. I established endowments for 10 awards to be given annually for promoting cardiovascular activities; this institute was recognized as one of the premier institutions in biomedical sciences in North America. In order to enhance the profile of the Canadian cardiovascular community, I organized 12 conferences in my capacity as Chairman; these were attended by 300 to 2,000 participants each. In addition, I served as member of the organization committees or advisory boards for 134 international conferences in biomedical sciences for the exchange of information among cardiovascular investigators. I also edited 52 books on the pathophysiology and therapy of heart disease for the benefits of young scientists in the developing world. In my capacity as Associate Editor for 26 years, I played a critical role in the development of "Canadian Journal of Cardiology", which is now the official journal of the Canadian Cardiovascular Society. Furthermore, I have served on the editorial boards of 26 national and international journals throughout my professional career; these include my current involvement in 9 journals in the area of cardiovascular pharmacology and medicine. I have also been involved in various grant review committees for different national and international funding agencies. For the past 29 years, I have been serving as the Editor-in-Chief of an international journal "Molecular and Cellular Biochemistry"; I have built this quarterly journal (600 pages per year) into a monthly publication (3600 pages per year).

While attending a symposium on stress-induced heart disease in 1970, I was asked by Dr. Eors Bajusz from Boston and George Rona from Montreal to serve on the Council of the International Study Group for Cardiac Metabolism as well as to organize a meeting for this group in Winnipeg in 1972. This conference became a truly successful event and I was elected as Secretary General with Dr. Richard Bing from Pasadena as President. This indeed was an excellent opportunity and a real challenge for me to develop national and international relationships in the area of experimental cardiology. I guess I was fortunate or that the time was right for me to promote the scientific basis for the practice of cardiovascular medicine and surgery. Within a span of 3 years, the membership in this organization expanded all over the world and we changed its name to the International Society for Heart Research (ISHR). I served this organization for 24 years first as Secretary General (1972-1987) and then as President-Elect, President, and Past-President (1987-1996). It was during this period that I was recognized in several countries including India as a

highly committed promoter of cardiovascular research. The Indian Section of ISHR established the Young Investigator Award Competition in my name, whereas the Pharmacological Society of India established the Naranjan Dhalla Oration Award to be given at their annual meetings. However, there was a general feeling among the leadership of cardiovascular science that there is an urgent need to promote the educational aspect of cardiovascular medicine and to develop new strategies for the prevention of heart disease. Accordingly, the International Academy of Cardiovascular Sciences was founded in 1996 with headquarters in Winnipeg to promote cardiovascular education and research as well as to highlight the importance of preventive cardiology. I was asked to assume the position of Executive Director whereas Dr. Howard Morgan of Danville, Pennsylvania was elected as the first President of the Academy. After a service of 20 years, I have now been elected as Honorary President of this organization. The Academy has different regional sections, which hold their own independent meetings and manage their own affairs. Several sections of the Academy, particularly the North American, European, South American and Indian Sections are developing very well and making mark for promoting young investigators. It is planned to establish a network for the centres of excellence in cardiovascular medicine and thus the Academy can be seen to be heavily involved in promoting education and research as well as improving human health.

Concluding Remarks



Statue of Dr. Naranjan S. Dhalla in the Citizens Hall of Fame in Winnipeg

I know there is a long way to go to achieve the objectives of preventing and improving the treatment of cardiovascular disease; however, I do see the light at the end of the tunnel. The path of blending professional services with academic research, which I chose during the development of my career, has always given me a great deal of satisfaction and I consider that my journey in the field of cardiovascular physiology and pharmacology has been a truly rewarding experience. I was indeed fortunate to participate in the establishment of the Institute of Cardiovascular Sciences in Winnipeg as well as the International Academy of Cardiovascular Sciences in addition to developing the

International Society for Heart Research. I hope these organizations will carry on with my mission for promoting cardiovascular education and the scientific basis for the practice of cardiovascular medicine. My contributions in defining the significance of metabolic disturbances and subcellular defects, during the occurrence of cardiac hypertrophy and heart failure, will be of some value to future investigators. My research effort by using pharmacological, biochemical and molecular approaches to understand the role of oxidative stress and intracellular Ca^{2+} -overload in ischemic- as well as stress-induced heart disease will hopefully lead to the discovery of newer, effective and safe therapies for the treatment of cardiovascular ailments. My contributions for building the profile of young and senior scientists as well as my services for promoting the University of Manitoba and the St. Boniface Hospital Research Centre were recognized when I was elected as the 2nd Greatest Manitoban of all-time in a province wide election by the Winnipeg Free Press. The Coat of Arms which was granted to me by the Canadian authorities as well as the installation of my statue in the Citizens Hall of Fame in Winnipeg will serve as legacy of my existence.

Table 1: Some Selected Review Articles Published by Dr. N.S. Dhalla

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Table 2: Some Selected Research Papers Published by Dr. N.S. Dhalla

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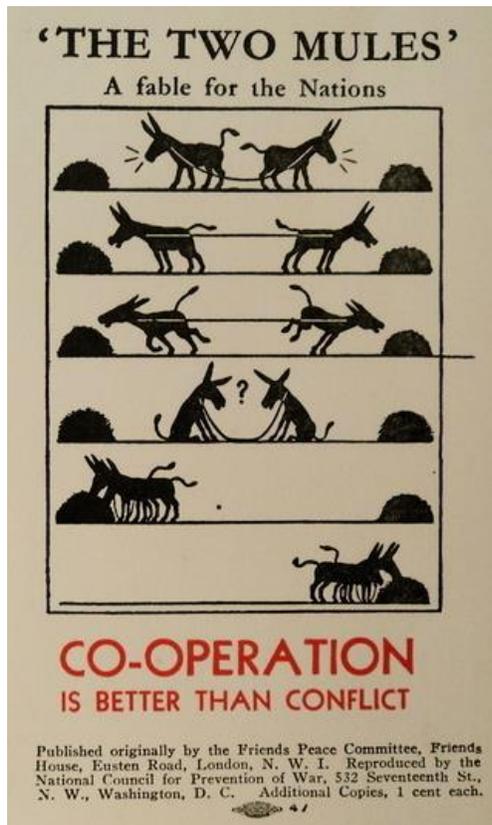
(Author-editor note: Reading Dr. Naranjan Dhalla's 60 years journey into Pharmacology was a treat for me. Going thru it, I was reminded of a young, enterprising, articulate and ambitious young man, whom I met 56 years back in Delhi under Dr. PK Das's tutorage. I was highly impressed by the clarity of his mind and the zeal to achieve big. Dr. Dhalla has not only done big, he has done the impossible. In those days so few Indians went to the west but he did the extraordinary in the USA and then created a position for himself in Canada that remains unparalleled. If I had myself not seen his statue in the Hall of Fame in Winnipeg I would have not believed its presence. His rise as a scientist who delved into the intricacy of various aspects of Cardiology is monumental. The fact that he was able to create an International Research Centre in Cardiology in Canada is highly praise worthy. This write up on his life and achievements is spell bounding. I hope story of his life will motivate many a young scientists and physicians to emulate him and do big in life.

**Prem Chand Dandiya
Jaipur, India**

Three Fables as 2017 Best Wishes

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Editor's Note: This message was sent by Dr. Chaldakov to his friends.



Homo reciprocans quero.

Diogenes, paraphrased

Today, a global commercialization increasingly dominating over human-to-human and country-to-country behavior. Used to suffer from communism (1944 – 1989), I am now really worrying about superliberalism and other variations on this common theme. I am worrying about our vulnerability to the actions of the most detrimental human behavior, that is, "the sustainable amorality," as F.M. Dostoyevsky called it more than a hundred years ago. Anyway, he expressed his conviction: "I will not and cannot believe that evil is the normal condition of mankind. And yet how simple it is: in one day, in one hour everything could be sorted out."

This scenario prompted me to share with you three fables as an attempt to focus on human's cooperation, empathy and virtue, that is, the Golden Rule of positive *reciprocity*.

A fable of two mules

The Two Mules above were taken from Wikipedia to illustrate herein a modification of Buridan's ass named after the French philosopher Jean Buridan (c. 1295 - 1363). The mules tied with a rope are placed precisely midway between two stacks of hay - the same in size and quality. Further, the fable clearly demonstrates that cooperation is better than conflict. When each mule tries alone to reach a stack of hay, the two mules remain hungry, both lose (lose-lose solution). When they sit and ponder together - without anyone imposing their decision upon them - they in tandem reach first one, then another stack of hay and thus feed well. In effect, the two mules earn (win-win solution).

This fable reminds Aristotle's *De Caelo* (On the Heavens) which describes the hungry and thirsty man who is placed equidistant between food and water, but he cannot decide to eat or drink - and so the man remains hungry and thirsty.

A fable of a group of African children

Anthropologist offered to children of African tribe to play a game. He set fruit basket at distance of them and tells the children: "He among you who was the first he reaches the basket, awarded all the sweet fruit." When he made a sign to the children start the race, they - without anyone imposing their decision upon them - firmly grappled with their hands and ran together, and then all sat together and enjoyed a delicious fruit. Surprisingly, anthropologist asked the children why they ran all together, because each of them could enjoy the fruit for himself. Then they responded: "Obonato. Is it possible that one has been happy if all the other sad?" Obonato in their language means: "I exist because we exist."

This is a reminiscence of *Je est un autre* (I is another, within me) - written by the great French poet Arthur Rimbaud on 13 May, 1871 in a letter to his teacher.

A fable of hedgehogs

It was very cold and many animals died from cold. Seeing that the hedgehogs decided to unite in groups to warm each other, but each of thorns hurt their neighbors. Then they decided to move away and began to die of frostbite. Smarter and better educated hedgehogs however agreed - without anyone imposing their decision upon them - to tolerate spines

of others and thus learned to live with the small wounds from communicating with the closest.

Magister dixit

The behavior of cooperation-empathy-virtue also has a healthy benefit. In his book *The Stress of Life*, published in 1956, Professor Hans Selye wrote that one way to reduce the harmful effects of bad stress (distress) is to cooperate with each other. Such a reciprocal behavior reminds a **biblical statement**: “do unto others as you would have them do unto you” (Luke 6: 31). Likewise, magnetic resonance imaging (MRI) demonstrates that the same brain structures and molecules mediate altruism, cooperation and pleasure. Thus scientists are beginning to decode the Golden Rule of *reciprocity*,* whereas we are *still* living in the atmosphere of insufficiency of *social, political and personal ethics of*

cooperation, obonato and empathy. Globally, not only in Bulgaria.

Perhaps, we - mentally and morally - are in a glacial period of human ethics. Hence indefinitely postponing the onset of something new, nice, big, forever - paraphrasing a dream of the Hungarian (Magyar) poet Endre Ady, who in the early 20th century "helped the sun with a lamp - to shine."

In his poem "After the conjuncture little men" he wrote:
Now the little men of conjuncture feast,
but construction stones are already ready.
However, we will come to do
something new, Magyar, nice, big, forever.

And globally.

* Chaldakov G, Chaldakov N. Homo reciprocans. European perspective. In: *The Human. Thoughts, Feelings, Friendship*. Publisher "Atelie'89", Varna, 2010. pp. 33-34.

A fortiori

The bird is not jealous of the airplane.
The fish is not jealous of the dolphin.
The grass is not jealous of the flowers.
A man who crawls is jealous of
A man who walks.
A man who walks is jealous
Of a man who flies.
A man who flies is not jealous of
Someone else who flies.

Soul Survives Moves On and On

Our life interplay of genetics and destiny journey after journey,
Conception to end and beyond cosmos journey to eternity,
Wait for a second busy terribly in materials so earthly,
No amount of ICU* IBAP** VAD*** ventilators can extend life beyond jury
Email, facebook facetime twitter skype whatsapp,
Silent faceless humourless not even a whisper lying alone,
Soul gone physical body kept captive no symphony of life,
Years pass sometimes a lone candle bouquet only solace
Mother earth fire space final resting place thou physical body,
All perishes the palace jewellery mint but for your deed,
Only soul survives moves on and on depending upon,
Thy contribution attitude fellow peers nation future generation
Wise men say pause a while do something worthwhile body mortal,
Soul leaves this body enters into another master orchestra plays on,
This cycle of birth to death and rebirth goes on and on,
Physical body perishes soul survives moves on and on

*ICCU - intensive care unit

**IABP - An intra-aortic balloon pump (IABP) is a mechanical device that helps the heart pump blood

***VAD - Ventricular assist device, a mechanical pump that takes over the function of the damaged ventricle of the heart and restores normal blood flow

**By: Dr. Shridhar Dwivedi
New Delhi, India**

Tribute to Dr. Ben McNamara on his 75th Birthday

Editors Note: Dr. Ben McNamara was President of the North America Section of the IACS and he devoted all of his efforts to encourage young cardiovascular scientists to achieve their full potential. Thus the IACS pays him a special tribute on his 75th birthday. A brief sketch of his autobiographical account is as follows:



Dr. Ben McNamara

I was born in Shreveport, LA in 1942. My parents Inez and Dennis (so I was called Ben) left Shreveport and we moved to Dallas, Corpus Christi and finally St Paul. Canadian oil was being brought there to be refined. Little did I know I would reverse this flow 14 years later to be refined in Canada. I graduated from the University of St Thomas, St Paul, MN and attended St Louis University.

I met Naranjan Dhalla at a \$1.50 steak house in St. Louis in 1968. One of my medical student roommates volunteered in his laboratory. Three months later after a few discussions I found myself on the way to Winnipeg. There was no laboratory, just old rooms in a Quonset Hut built during the War To End All Wars (it is still there). We began to order: beakers, centrifuges, scintillation counter, mouth pipettes and so on. Five years later after learning a lot and making great friends, including the irreplaceable, irreplaceable Naranjan (“Professor”), I found myself on the way to Peter Bent Brigham/Harvard Medical School and the laboratory of Dr. Bill Weglicki. The laboratory had three post docs two faculty members and technicians. We began the day at 7am beheading chickens with muscular dystrophy. Again I learned a lot more and appreciate the lifelong friendship and mentorship of Bill.

Dr. Naranjan Dhalla, Distinguished Professor, Executive Director of IACS and Editor-in-Chief of Molecular and Cellular Biochemistry has said *“I am finding it extremely hard to describe Ben McNamara in spite of the fact that we have been closely associated over the past 49 years. I saw him from the days of his graduate studies to developing into a cardiovascular scientist with impeccable integrity. He is a great leader with extra-ordinary human qualities and his outstanding dedication to promoting the IACS and young scientists is commendable. He has been a moving force for maintaining high ethical and scientific standards in editing for the Molecular and Cellular Biochemistry. There are not very many*

people like Ben McNamara and I wish everybody has the great fortune of having a friend, colleague and confidant, as I have in the name of Ben McNamara.”

Having studied calcium accumulation and uptake in sarcolemma, sarcoplasmic reticulum and mitochondria isolated from cardiac and skeletal muscle and brain I was interested in the role these organelles played in vascular smooth muscle calcium metabolism as little was known about this.

I headed south in 1975 to the Department of Pharmacology at Tulane University School of Medicine in New Orleans. I never wandered again.

Initially I was sidetracked by the unexpected death of a faculty member to study EDRF formation and activity in smooth muscle employing smooth muscle baths. After working with a senior graduate student for a year I began my studies isolating mitochondria and sarcoplasmic reticulum from bovine intrapulmonary arteries. I characterized the calcium uptake and binding capacities of these organelles and began to determine the effect of prostaglandins on these properties. As I proceeded I included prostaglandin metabolism studies from arachidonic acid and radiolabeled prostaglandin H₂ that I synthesized. In the 1990’s I established a rabbit model of balloon catheter-induced aortic injury. A number of different agents were studied to determine the ability to attenuate the development of intimal hyperplasia and to correlate this with re-endothelization of the area above the intimal hyperplasia. This model allowed the first demonstration that L-arginine in the diet can attenuate the development of intimal hyperplasia. Later an alloxan-treated rabbit model of balloon catheter-induced aortic intimal hyperplasia for studies of Type 1 diabetes. It was noted that very high blood glucose levels inhibited the growth of intimal hyperplasia. Eventually these studies were extended by the development of a Type 2 diabetic rat model of carotid artery intimal hyperplasia.

I served on committees of the University and the School of Medicine, including being twice elected by the faculty of the School of Medicine as Chairman of the General Medical Faculty; I was Vice-Chair of the Department of Pharmacology and Director of Graduate Studies within the department; I also served for 10 – 15 years on the Admissions Committee of the School of Medicine. While

servicing on this committee, I noticed that many applicants with acceptable MCAT scores combined with lower undergraduate GPAs would not be admitted. Looking at the overall application it was clear many of these students would make excellent medical students. Discussions with a friend and colleague in the Department of Pharmacology led to the co-development and design of a tuition-bearing Master of Science degree program. This was designed for students who needed to augment their credentials to achieve their academic goals. Pharmacology is a central basic medical science which requires understanding of physiology, biochemistry and some degree of understanding of the other basic medical sciences. As such, students who took the Medical Pharmacology course alongside the Tulane medical students could demonstrate his or her ability to succeed in a medical school setting. The feeling of having one of these students who had given up hope come to me and tell me they had gained entrance was incredible. These students knew this was their last chance and they focused and studied. The first class was admitted in 1999. Since that time more than 500 students have graduated with 80% gaining entrance into a United States Medical School. The tuition from this program amounted to hundreds of thousands of dollars annually which was kept by the Department of Pharmacology. Following Hurricane Katrina, one half of this income was given to the Interdisciplinary Doctoral Program of the School of Medicine. Today, according to this formula, more than \$250,000 annually goes to the Department of Pharmacology and more than \$250,000 annually to support the stipends and tuition waivers for doctoral students admitted into the Interdisciplinary Doctoral Program within the School of Medicine.

In May, 2005 I chaired the meeting of the ISHR in New Orleans. During this meeting Dr. Dhalla oversaw the organization of the North American Section of the International Academy of Cardiovascular Sciences (IACS). I was the first Secretary of this new entity. Three months later Hurricane Katrina struck New Orleans. Tulane University took this opportunity to break the tenure of senior professors and to dissolve schools within the University. About 175 faculty members were discharged. I was forced out of the University and my career, which began when I entered Dr. Dhalla's laboratory in 1968, abruptly ended.

Having devoted much of my effort to students and their education over the previous decade I worked with the other officers of the newly formed North American Section as well as officers of other sections around the world and with the International organization in Winnipeg to build the new North American Section to focus on the students during their mentored tour throughout their doctoral studies. I became President of the North

American Section. I worked with Dr. Dhalla and Dr. Pierce to give underpinnings to this fledgling but important new avenue for students to understand the importance of mentorship and creation of new friends at other institutions. The Academy gives students a place to meet to exchange ideas, research hypotheses/data and to identify with mentors outside their institutions. With time, students become mentors and mentors become colleagues.

In my career there have been highs and lows but the friendships I have formed here and around the world are invaluable as are the memories of the meetings where we met annually. Naranjan Dhalla, Grant Pierce, Phil Kadowitz, Morris Karmazyn, Steve Schaffer, Vivian Fonseca, Bill Weglicki in North America. There are many others in Academy sections around the world especially Slovakia, the Czech Republic and India. One of the benefits of a research career is traveling to meetings and talking with those whose publications we read at home. It is the role of the Academy to prepare students for this adventure and to make sure they know they can ask questions.

"It's easy to forget the early seminal advances when science moves so quickly these days," said Dr. Grant Pierce, President, North American Section of IACS. "But in the mid 1970's, when we were still trying to understand how Ca^{2+} movements were related to cardiac contraction and from where this Ca^{2+} originated, the McNamara sarcolemmal membrane preparation led the field for some time and allowed us to define cardiac sarcolemmal ionic transport characteristics, particularly during pathogenic conditions. These were heady days for ion transport scientists and Ben's work was leading the way."

In 2001 I had the great luck of meeting Fred Tujague. He has been my mainstay throughout the years, during good and especially bad times. Everybody needs a Fred.



L-R: Dr. Ruth, Fred and Ben: "strange bedfellows in Stockholm, 2009"

It is up to the current faculty members of the Section to make sure it goes forward, has annual meetings which students look forward to attending to present their data.

A former mentor and colleague, Lou Ignarro told me the formula for success is: to identify an interesting problem, focus tightly on it, work like hell, publish and travel to meet colleagues for discussions to broaden your thoughts and to share insights. It worked for him.

Dr. Steve Schaffer expressed his appreciation for the service of Dr. McNamara to the IACS and to the field of cardiovascular research in general. *“His ideas have revolutionized the content and make-up of scientific meetings, emphasizing among other factors the educational value of scientific meeting to young*

investigators. He not only organized his own meetings but assisted in multiple ways in the organizing of virtually all of the Academy meetings since their origin. His probing questions alone were educational, not only to young investigators but also established investigators. He has always promoted interactions of scientists across international borders, contributing to the success of numerous international meetings. I hope that Dr. McNamara had a happy 75th birthday celebration and he will achieve all of his aims during the year of his 75th birthday. Thank you Dr. McNamara for being an excellent role model, a dear friend and colleague, and an insightful leader of the cardiovascular sciences. We have all benefited from our association with you.”

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Several Distinguished Scientists Honored in New Delhi – IACS – India Section – February 9-11, 2017

1. Dr. Rakesh Kukreja Oration Award: Dr. Balram Bhargava
2. Dr. Suresh K. Gupta Oration Award: Dr. Pawan Singal
3. Dr. Harpal Buttar Oration Award: Dr. Viswanathan Mohan
4. Dr. Ramesh Goyal Oration Award: Dr. Om Parkash Yadava
5. Makoto Nagano Award for Distinguished Achievements in Cardiovascular Education: Dr. Andras Varro
6. Distinguished Leadership Award in Cardiovascular Sciences: Prof. Arunabha Ray
7. Distinguished Service Award in Cardiovascular Science, Medicine and Surgery: Prof. Kavita Gulati
8. Two Honours for Dr. Dhalla

Rakesh Kukreja Oration Award: Dr. Balram Bhargava



Dr. Balram Bhargava

Dr. Balram Bhargava is Professor of Cardiology at the All India Institute of Medical Sciences, New Delhi and also serves as the Executive Director for Stanford India Biodesign Centre, School of International Biodesign (SiB). Professor (Dr) Balram Bhargava is an outstanding cardiologist, one of the foremost leaders in biomedical innovation, public health, medical education and

medical research. He has during his tenure as faculty at AIIMS for over 25 years treated about a quarter million patients and trained over 200 cardiologists who are now leading several departments/hospitals in India and abroad.

Professor Bhargava has excellent leadership qualities; and has established the India-Stanford Biodesign programme, a unique interdisciplinary fellowship programme to foster innovation, design in low cost implants/devices. This programme has led to the establishment of the School of International Biodesign (SIB) at AIIMS. This school in its ten years since inception has trained nearly 100 young innovators (doctors, engineers, designers, entrepreneurs). This has further led to development of 30 low cost medical devices (45 provisional patents, 5 PCT applications) leading to 10 startups. One of the low cost devices is in the Indian market and one device has been approved by the USFDA. He developed the indigenous Platinum Iridium coil coronary stent and has been instrumental in clinically evaluating and establishing the use of two other laser cut medicated Indian stents (Supralimius, Sahajanand Medical Technologies, Surat and Release-T, Relisys Medicals, Hyderabad). These low cost indigenous stents have benefitted several thousand

patients. The philosophy of the programme has been “*More for less for more*” with a mandate to promote Global Affordable Need Driven Healthcare Innovation (GANDHI).

He set up the c-GMP Centre for Excellence for Stem Cell Studies, at AIIMS which has initiated treatment of patients with dilated cardiomyopathy; this has benefitted number of no-option heart failure patients waiting on the cardiac transplant list. He has a UKIERI grant to study heart failure.

He is currently developing the Chest Compression Device for Sudden Cardiac Death patients; funded by the Wellcome Trust, London and is providing leadership for creative disease prevention, early detection and transport system for sick cardiac patients. This programme mission DELHI (Delhi Emergency Life Heart-attack Initiative) is in the process of early diagnosis and treatment of heart attack patients by trained motorcycle first respondent paramedics.

He is an innovator par excellence with innovations touching everyday lives with very huge social impact for which he has started the Society for Less Investigative Medicine (SLIM). He has published several papers on the harmful cardiovascular effects of chewing tobacco and is evaluating the continuous blood pressure of DTC bus drivers in Delhi. He has led two major trials in India funded by the NIH, Bethesda, USA which has changed clinical practice. He has pioneered several techniques in interventional cardiology.

He has been awarded the SN Bose Centenary award by the Indian National Science Congress and National Academy of Sciences Platinum Jubilee Award, Tata Innovation Fellowship and Vasvik Award for Biomedical Technology Innovation, Ranbaxy Award and the OP

Bhasin Award in the field of Health and Medical Sciences. He is currently the Founding, Editor in Chief of the British Medical Journal Innovations (BMJi). He has been awarded the 'Padma Shri' high civilian award by the

Honourable President of India and the UNESCO Equatorial Guinea International Prize for research in Life Sciences at Paris.

Suresh K. Gupta Oration Award: Dr. Pawan Singal



Dr. Pawan Singal

Dr. Pawan Singal is a professor of Physiology and is Director of the Institute of Cardiovascular Sciences, St. Boniface Hospital and the University of Manitoba, Winnipeg, Canada. Dr. Singal completed his BSc Hons (1968) and MSc in Biophysics (1970) from Punjab University, India; PhD in

Physiology in 1974 from the University of Alberta and his DSc degree in 1994 in Cardiovascular Pathophysiology. Dr. Singal joined the Physiology Department at the University of Manitoba as a lecturer, rose through the ranks and has been a professor since 1990. He served as Associate Dean for the Faculty of Graduate Studies, University of Manitoba. He is also holder of the Naranjan

S. Dhalla Chair established by the St. Boniface Hospital Research Foundation.

Internationally known for his work on oxidative stress and heart failure, Dr. Singal has made significant contributions in our understanding of the sequelae of heart failure due to doxorubicin, chronic pressure overload as well as myocardial ischemia/reperfusion. He has published 270 papers, has co-edited 31 books and trained more than 100 students, fellows and visiting scientists. He has received more than 90 national and international recognitions. The University of Manitoba has established an award in his name called 'Pawan K. Singal Award for Graduate Students in Cardiovascular Sciences'. His name has been added to the Wall of Fame in the University Centre at the University of Manitoba recognizing his outstanding teaching skills and research.

Harpal Buttar Oration Award: Dr. Viswanathan Mohan



Dr. V. Mohan

Dr. Viswanathan. Mohan is the Chairman and Chief of Diabetology at Dr. Mohan's Diabetes Specialities Centre at Chennai in South India which is a WHO Collaborating Centre for Noncommunicable Diseases Prevention and Control. He is also President and Director of the Madras Diabetes Research Foundation.

A student of Madras Medical College, Dr. Mohan was awarded several prizes and medals during his undergraduate and postgraduate medical studies including the Dr. R.V. Rajam Gold Medal for standing first in the University of Madras in M.D. (General Medicine). Conferred Fellowships from all the four Royal College of Physicians of UK, all the three Science Academies of India, and Mastership of American College of Physicians (MACP). Deeply interested in research from his undergraduate days, Dr. Mohan has published 1042

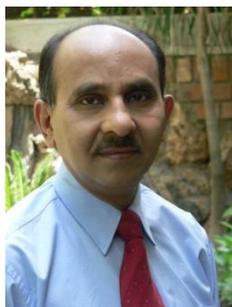
papers in peer reviewed journals and textbooks. His work has a H-index of 89 and has over 36,000 citations. His current areas of interest in research include Epidemiology of Diabetes and its complications, Genomics of Diabetes and Prevention of Diabetes through Community Empowerment. Dr. Mohan set up the Sai Rural Diabetes Project at Chunampet which is now internationally recognized as a model for rural diabetes care in developing countries.

Dr. Mohan has received over 140 awards including the prestigious Dr. B.C. Roy National Award by the Medical Council of India and Dr. B.R. Ambedkar Centenary Award for excellence in Biomedical Research from the Indian Council of Medical Research. Dr. Mohan also provides life long free treatment to thousands of poor patients through the free diabetic clinics established by him and has conducted over 2000 free diabetes camps including several along with the Sri Sathya Sai Organization.

For his extensive contribution in the field of diabetes in 2012, Dr. Mohan was awarded the prestigious Padma

Shri, one of the highest civilian awards from the Govt. of India.

Ramesh Goyal Oration Award: Dr. Om Parkash Yadava



Dr. O. P. Yadava

Dr. Om Parkash Yadava is Chief Executive Officer and Chief Cardiovascular Surgeon at National Heart Institute at New Delhi, India

Om Parkash Yadava, a National Board of Examination (2014) and Indian Medical Association (2015) National Awardee for Excellence in Medical Education, is an innovator and researcher of distinct, having pioneered Total Arterial CABG in India. With over 12,500 surgeries, Yadava is amongst the country's foremost cardiac surgeons and is featured in the Limca Book of Records (2005). He is an acclaimed academician and an Adjunct Professor, DY Patil University, Mumbai. He is currently CEO of National Heart Institute, Delhi and Director, All India Heart Foundation.

A teacher at heart, Yadava has edited/authored chapters in 18 books and monographs and has 125 scientific publications and over 450 presentations in national and international conferences. He has conducted 30 workshops and symposia. He is M.Ch and DNBE Examiner and Inspector for National Board of Examinations and Garhwal University. He is Fellow of Indian Association of CTVS Surgeons, Cardiological Society of India and Indian College of Cardiology. He is Editor-in-Chief of speciality journal Cardiology Today and Indian Journal of Thoracic & Cardiovascular Surgery, besides being on the board of many national and international journals. He is Advisor, Govt. of Uttarakhand and has been Member Technical Advisory

Committee, Govt of Delhi; Governing Council, Rajiv Gandhi Super Speciality Hospital; Health Committee, PHD Chamber of Commerce and Executive Council, DCR University of Science and Technology.

A social activist, he established the Cardiac Centre in Almora, and was also first to perform open heart surgeries in rural Himalayas, thereby taking specialised services to the door step of the under-served. In 2006, he launched the Rotary's 'Gift of Life' Programme in India wherein under-privileged children from India and abroad, like Nepal, Bangladesh, Pakistan, to distant Uganda and Nigeria, are operated gratis. He founded the NGO, Uttarayana Foundation, and established a charitable hospital in Village Maat, Almora. For his philanthropic leanings, Rotary International honoured him with the 'Paul Harris Fellowship' and featured him on the Poster of 'Gift of Life' Programme.

Recognition from peers has been generous, including Rajiv Gandhi Excellence Award, 1992; MAMCOS Award, 2005; Life Time Achievement Award bestowed by Hon'ble President Dr. A.P. J. Abdul Kalam, at Rashtrapati Bhawan, 2006; DMA Centenary Healthcare Award, 2014; NBE Eminent Alumnus, 2014; IMA Medachiever Award, 2014; Outstanding Reviewer, Elsevier 2015 and Most Comprehensive Reviewer, European Cardiology Congress, 2015, London. He has delivered numerous Orations including the prestigious Sri Jayadeva Oration, Indian College of Cardiology, 2009 and Uma Rani Banerjee Oration, Cardiological Society of India, 2014. He was awarded the L.V. Thapa Oration, Surgical Society of Nepal, 2006 and IMA bestowed upon him the Dr. K. Sharan National Award for Excellence in Cardiology, 2006.

Makoto Nagano Award for Distinguished Achievements in Cardiovascular Education: Dr. Andras Varro

András Varró is a M.D. graduate (1978) from the Szeged Medical University in Hungary. He also completed PhD degree in 1987 and in 1998; he received D.Sc. degree from the Hungarian Academy of Sciences. Between 1978 and 1990 he worked at The Cardiovascular Department of the Institute for Drug Research in Budapest where he undertook several different research projects involving *in*

vivo and *in vitro* pharmacological methods for the development of cardiotonic and antiarrhythmic drugs. Between 1991 and 2001 he was working at the Department of Pharmacology and Pharmacotherapy at the University of Szeged, Hungary with Professor Julius Gy. Papp. Dr. Varró succeeded him as Chair of the department in 2001. He was appointed as Vice Rector of the



Dr. András Varró

University of Szeged in 2011 supervising science and innovation. During his career, he spent 5 years at the Kranner Institute of Cardiology, Indiana University with Professor Borys Surawicz, and at the Department of Pharmacology and Cell Biophysics, University of Cincinnati, Ohio with Professors Arnold Schwartz and David Lathrop. He also worked at the Department of Veterinary

Preclinical Sciences, University of Liverpool, U.K. with Professor David Eisner. His major research interests include physiology and pharmacology of cardiac potassium channels, cellular mechanisms of arrhythmias, antiarrhythmic and proarrhythmic drug actions. His research also focuses on the genetic background of LQT

syndromes involving cellular (gene transfer) techniques and experimental *in vivo* (transgenic LQT rabbit model approaches). His most important scientific achievements have been published in high impact peer-reviewed journals and include his seminal work on the elucidation of the cellular mode of action of amiodarone, the role of the slow delayed rectifier potassium current (I_{Ks}) in cardiac repolarization and repolarization reserve, characterization of the native human transmembrane potassium currents, and the elucidation of the possible antiarrhythmic effect of the sodium calcium exchanger (NCX).

Dr. Varró served as editor for the British Journal of Pharmacology (1998-2002) and as editor of Cardiovascular Research (2013-). He has published almost 280 full length papers and 9 book chapters with more than 7600 citations with H- index of 49.

Distinguished Leadership Award in Cardiovascular Sciences: Prof. Dr. Arunabha Ray



Prof. Arunabha Ray

Prof. Arunabha Ray is Director-Professor and Head, Department of Pharmacology at Vallabhbhai Patel Chest Institute, Faculty of Medicine, University of Delhi, India. He graduated with medical degree (MBBS) from the University of Calcutta with postgraduate (MD) and doctoral (PhD) degrees in pharmacology from the Faculty of Medicine, University of Delhi. He has

almost 40 years of teaching and research experience in basic and clinical pharmacology and allied biomedical sciences. Early in his professional career, he received basic training as a physician in clinical medicine and cardiology. Prof. Ray also underwent training in basic and clinical pharmacology and made significant contributions in the area of medical education and research in pharmacology and allied areas. He also received postdoctoral training in North America.

Prof. Ray is internationally recognized as one of the leading exponents of stress research and stress pharmacology. Using a novel approach, he has integrated concepts of neuropharmacology and immunopharmacology to explain biological responses to emotional and environmental stressors and their impact on health and disease. The major focus of his research in the past two decades has been nitric oxide (NO), a

gasotransmitter, well known for its cardiovascular effects, and its role as an endogenous anti-stress molecule by using acute and chronic stress models and proposed NO mediated signaling pathways for stress induced angiogenesis and immunomodulation, as well as for stress adaptation. Prof. Ray is a prolific researcher and his research has been recognized at the highest level which has led to several awards, honors and fellowships. Prof. Ray has been invited to several research/scientific platforms and academic institutions/universities to deliver lectures on his area of research expertise. Most notably, he was awarded the Achari Prize (1983), the Uvnas Prize (1984) and the Young Asian Pharmacologist prize (1985) for excellence in research as a young pharmacologist. Later, he was awarded with a WHO Fellowship (1991) to study and train in immunopharmacology and allied areas in USA and Canada. He has received prestigious oration awards of the Indian Pharmacological Society; Prof. B. Mukherjee Oration; Prof. B.N. Ghosh Oration; Prof. S.B. Pandey Oration and Prof. N.S. Dhalla Oration. He has been invited as chairperson and speaker at several international meetings - most notably consecutively at IUPHAR sponsored conferences over the last 11 years, and as visiting scientist and guest speaker at leading international institutions/universities across North America, Europe, China and Africa. Consequently, he is now internationally recognized as one of the leading exponents in the field of stress and NO research. He has had collaborations with research laboratories in the academia and pharmaceutical industry both at the national and international levels - a further evidence of his

scientific acumen. He has also organized several national and international scientific meetings attracting global experts and delivered guest lectures in reputed international universities/conferences. He is expert member at several national scientific committees at organizations including ICMR, DST, DBT, DRDO, CSIR, and UGC. Prof. Ray serves on academic/research committees of several leading universities/institutes - thus playing a key role in guiding scientific research in pharmacology, toxicology and allied areas. He has more than 150 publications and has authored reference books and textbook in pharmacology and related areas. In view of his contributions to medical education and research he was elected as Fellow of National Academy of Medical Sciences (FAMS, 2005) and Fellow of the Indian Pharmacological Society (FIPS, 2007).

Prof. Ray is a highly reputed teacher and has made significant contributions for the advancement of medical education in the specialty of pharmacology and allied areas. In addition to being an excellent teacher with more than 37 years of teaching experience in the subject, he has guided/supervised research of several M.Sc, M.Pharm, MD and PhD students of the University of Delhi and

postdoctoral fellows, who have later proceeded to make a mark for themselves as successful researchers/professionals in their chosen field. He is currently core group member of an international group (ORPHEUS) which is working for uniform Global Standards of Ph.D. Education in Biomedicine and has disseminated his views as expert member in conferences/workshops in Spain, France and South Africa. He has been actively associated with several professional bodies/societies in pharmacology as well as allied fields, viz. Indian Pharmacological Society, International Academy of Cardiovascular Sciences, Immunological Society of India, Society for Toxicology, Society of Pharmacovigilance, International Neuroendocrine Federation, International Society for Ethnopharmacology, National Academy of Medical Sciences etc. He held senior executive positions in the Indian Pharmacological Society. Prof. Ray is also the Founder-Secretary of the Society for Nitric Oxide and Allied Radicals (SNOAR) which was established in 2011 for advancement of research in Nitric Oxide (NO) and allied radicals, and organized several scientific meetings on the subject matter.

Distinguished Service Award in Cardiovascular Science, Medicine and Surgery: Prof. Kavita Gulati



Dr. Kavita Gulati

Dr. Kavita Gulati is Professor in Pharmacology at Vallabhbhai Patel Chest Institute, University of Delhi. She obtained her Master's degree in Pharmacology from the All India Institute of Medical Sciences and subsequently did her Ph.D from the University of Delhi. Dr. Gulati has more than 24 years of teaching and research experience in Clinical and Experimental Pharmacology

and Toxicology in different capacities in India and abroad. She is the recipient of several national awards including the Achari Prize and Uvnas Prize and the prestigious Prof. B.N. Ghosh Oration of the Indian Pharmacological Society. She is a member of several professional bodies/societies relating to pharmacology and allied sciences (viz. National Academy of Medical Sciences, International Neuroendocrine Federation, New York Academy of Sciences, Society of Toxicology, Society of Pharmacovigilance, Indian Pharmacological Society, etc. Her biography has also been included in the

Marqui's "Who is Who" in the world in science. Her research interests are in Respiratory Pharmacology and Toxicology, Neuropharmacology and Stress Research, and she is the Principal Investigator of several extramurally funded research projects (viz. DST, DBT, AYUSH, CSIR, ICMR, etc.). She has the distinction of being invited to present talks at prestigious international meetings like IUPHAR (China, Copenhagen and South Africa), CMB Congress (France), World Stress Congress (Hungary), and CPT Congress (Australia), International Immunology Forum (Canada). She has been a visiting scientist to reputed international institutions like Semmelweis Medical University (Budapest, Hungary), University of Pittsburgh Medical Center (USA), Army Medical Institute (Xian, China), University of Minnesota at Minneapolis (USA), University of Illinois at Chicago (USA), University of Manitoba (Canada), West Cape University (South Africa) etc. and expert member at different Institutions and Government organizations in her field. She has published extensively in leading national and international journals (more than 120 publications), is co-author of several chapters in reference and textbooks of Pharmacology, and co-editor of four books in Pharmacology.

Two Honours for Dr. Dhalla



Photo Credit: Robert Blaich, St. Boniface Hospital Albrechtsen Research Centre

Dr. Naranjan Dhalla, who received two honours on a recent trip to Delhi, India; one for outstanding contributions to the field of cardiovascular sciences, and another presented to him as Guest of Honour at the International Conference on Recent Advances in Cardiovascular Research: Impact on Health and Disease. The conference was hosted by the University of Delhi February 9-11, 2017. Dr. Dhalla also gave the keynote

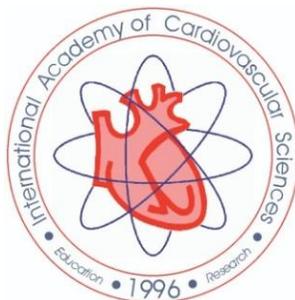
presentation “CO₂ water-bath therapy promotes blood flow and angiogenesis in diabetes with peripheral ischemia” at the conference.

Dr. Dhalla has published more than 620 full length papers in refereed journals and 180 papers in books and monographs. His research work has been cited more than 23,000 times and he edited 55 books on various aspects of the cardiovascular system. He has been an invited speaker at more than 355 national and international conferences and 145 institutions. Dr. Dhalla has trained more than 163 graduate students, postdoctoral fellows and visiting scientists. In his capacity as Secretary General and President of the International Society for Heart Research, he was engaged in promoting the scientific basis of cardiovascular medicine for 25 years. He has been Editor-in-Chief of a major international journal “Molecular and Cellular Biochemistry” for the past 30 years and is also serving as Executive Director of the International Academy of Cardiovascular Sciences since 1996. He has received 190 honours and awards from all over the world including MD/DSc Honorary Degrees from 6 Institutions and Honorary Professorship from 4 Universities. Dhalla is Honorary Life President of the IACS and is serving as Distinguished Professor, University of Manitoba and Director of Cardiovascular Developments at the St. Boniface Hospital Albrechtsen Centre, Winnipeg, Manitoba.

Call for Applications/Nominations for IACS Fellowships

The International Academy of Cardiovascular Sciences awards Fellowships to established investigators/promoters of cardiovascular activities all over the world. These individuals are usually full professors, senior scientists and/or high profile administrators in the area of cardiovascular sciences. At any given time, the total number of Fellows will not exceed 250

(www.heartacademy.org; see listing of active Fellows on pages 24-27 of the CV Network, Volume 15, 2016). Applications/Nominations with 2 pages of major achievements and CV should be sent by May 30, 2017 to N.S. Dhalla, Executive Director, IACS, St. Boniface Albrechtsen Research Center, Winnipeg, Canada (Email: nsdhalla@sbrc.ca).



Announcements for Global Health Champion Award and Opening of Cardiac Intensive Care Unit in Jamaica

Global Health Champion Award Winner: Dr. Ernest Madu



Dr. Ernest Madu

The Center for Global Health in the Perelman School of Medicine at the University of Pennsylvania awarded Dr. Ernest Madu, chairman and CEO of the Heart Institute of the Caribbean with its first annual Global Health Champion Award. Madu was presented with the award September, 2016 as part of a celebration for Penn's newly launched Center for Global Health.

Madu is an internationally recognized authority in cardiovascular medicine and innovative healthcare solutions. He has led multiple transformational health care projects that bridge gaps in access to quality health care delivery in Africa and the Caribbean.

“We are thrilled to bestow Madu with our inaugural Global Health Champion award,” said Glen Gaulton, PhD, vice dean and director of Global Health in the Perelman School of Medicine. “Madu’s commitment to health care quality and access is truly remarkable. His tremendous achievements in global health serve as an inspiration to our students and faculty as we continue to build upon our mission to advance worldwide health equity through enhanced awareness and access to care.”

Madu founded the Heart Institute of the Caribbean (HIC) in Kingston, Jamaica in 2004. The revolutionary health clinic serves as the center of excellence for cardiovascular diseases, occupational health, diabetes care, and general internal medicine in the West Indies. Prior to HIC’s inception, the only option for patients in need of these services was to travel at huge expense to the United States or other countries with more developed health care infrastructure. To date, HIC has provided more than \$1 million in free or reduced care to its patients, a significant contribution in an area where 56 percent of hospital deaths are caused by cardiovascular disease.

“This award is a true honor and signifies the increased efforts from the global health community to prioritize non-communicable diseases,” Madu said. “Today, cardiovascular disease is second only to HIV/AIDS as the leading cause of death in sub-Saharan Africa. I look

forward to a continued partnership with the Penn Center for Global Health to combat this growing epidemic and help improve the health and lives of people in need around the world.”

In addition to his role as Chairman and CEO of HIC, Madu has published more than 100 scientific papers in peer-reviewed medical journals and his work has been profiled in leading journals and magazines. He is a fellow of the American College of Cardiology, the European Society of Cardiology and the Royal College of Physicians, Edinburgh, and was most recently awarded the fellowship of the International Academy of Cardiovascular Sciences. Madu is also the Managing Partner of Indian Health Service Group, Nashville, Tennessee.

Heart Institute of the Caribbean Opens ICU for Heart Patients

The Heart Institute of the Caribbean (HIC) announced the opening of a fully equipped cardiac intensive care unit (ICU) dedicated to the care of heart patients.



The six-bed, high-acuity unit at HIC, which is scheduled to be open to the public March 2017, is the first of its kind in Jamaica and will be complemented with a 20-bed cardiac telemetry unit. It will be the first and only such service in Jamaica dedicated to the care of heart patients.

“No effort was spared in ensuring that the units meet and, in most cases, exceed current international standards. That was the reason we engaged the services of one of the leading hospital architects in the world, Ansel & Bailey, based in London, UK, with a track record of high-quality health care design for over 100 years,” Dr. Ernest Madu, chairman and CEO of the Heart Institute of the Caribbean, is quoted in a news release from the institution.

The intensive care and telemetry units at HIC have been designed to meet international standards, with dedicated oxygen and medical air lines leading to individual bed head units for each patient, HIC said. All beds are equipped with individual patient monitors linked to central monitoring stations and accessible to an international panel of experts to assist remotely in the care of patients to achieve optimal outcome, the release continued.

In addition, each bed in the intensive care unit comes with a dedicated ventilator for those patients who may need ventilator support. Three zones of healing music are also provided to create comfort for patients while being treated.

“We recognise that a very important factor in ensuring good outcome for critically ill patients is infection control. In recognition of this, we have employed the use of air handling units and ensured that the intensive care unit has

a laminar airflow environment, allowing for 20 to 25 air exchanges per hour, thus providing clean and filtered air at all times for patients and staff,” Madu continued.

Cardiac intensive care units have been in existence for more than 50 years, and have been shown to significantly improve survival and outcome for patients with heart disease. Unfortunately, even though cardiovascular disease is the number one cause of death in Jamaica, there has not been a dedicated cardiac or coronary intensive care unit in Jamaica, until now.

While there are several intensive care unit beds in a few hospitals in Jamaica, none of these are dedicated cardiac care units, which are usually specifically designed and equipped to cater to the specialised needs of heart patients. With the new cardiac ICU at HIC, heart disease patients in Jamaica can be cared for in a specialised cardiac intensive care unit specially designed and equipped for the care of heart patients.

Dr. Henry Steward guest speaker at 2nd Caribbean Canada Heart Health Education Dinner, Winnipeg, Canada

By: Paramjit S. Tappia, Winnipeg, Canada



Dr. Henry Steward

promoting education, research and prevention of cardiovascular disease, but specifically in the Caribbean counties. Dr. Steward spoke about the practice of cardiology in the Caribbean with particular focus on the challenges and opportunities for cardiovascular medicine in the region. Dr. Steward is a practicing cardiologist at

The Caribbean Canada Heart Health Education (CCHHE) held its 2nd Gala Dinner on February 11, 2017 with Dr. Henry Steward, from Curaçao, as guest speaker. Over 200 members of the local Caribbean community as well as scientists and physicians were in attendance. The CCHHE has adapted the mandate of the International Academy of Cardiovascular Sciences for

the Instituut Renata voor Hart- en Longziekten - as well as consultant cardiologist at St. Elisabeth Hospital in Curaçao. Dr. Henry Steward received his MD degree in 1975, graduating with the highest honor from the State University of Utrecht in The Netherlands. He completed his Cardiology specialization in 1982 from the Erasmus University, Rotterdam. Dr. Steward also has an MBA from the same University. He is co-founder and Director of the Thorax Centre, an outpatient facility with extensive non-invasive diagnostic modalities for heart and lung disease, in Curaçao. He is a Council Member of the Caribbean Cardiac Society for which he also served as President. Dr. Steward also serves as Council Member of the American Heart Association. Dr. Steward is a Fellow of different international scientific organizations including the American College of Cardiology, Dutch Cardiology Association and the International Society of Hypertension.



Dr. Bram Ranjiawan introduces Dr. Henry Steward



Kamta Roy Singh, President CCHHE, Presents Plaque to Dr. Henry Steward

Report on the International Conference on Recent Advances in Cardiovascular Research: Impact on Health and Disease and 9th Annual Conference of the IACS (India Section), Vallabhbhai Patel Chest Institute, University of Delhi, February 9-11, 2017

By: Prof. Arunabha Ray and Kavita Gulati, University of Delhi, India
Email: arunabha14@yahoo.co.in; Email: kavgul2002@yahoo.com

The International Conference on *Recent Advances in Cardiovascular Research: Impact on Health and Disease* and *9th Annual Conference of the International Academy of Cardiovascular Sciences (India Section)* (IACS-2017) was organized by and held at the Vallabhbhai Patel Chest Institute (VPCI), University of Delhi, New Delhi, India, from 9 – 11 February, 2017. Cardiovascular disorders are a major cause of morbidity and mortality worldwide and newer strategies aimed at prevention, diagnosis and treatment are constantly being devised. The theme of the meeting was contemporary advances in cardiovascular sciences and their potential applications in therapeutics. This was a multidisciplinary medical conference in which basic and clinical scientists met and interacted on a common platform and deliberated upon the recent developments in the field of cardiovascular and allied sciences. A major focus was on the translational approach for a rapid and smooth interface between preclinical and clinical specialties/professionals, as well as interactions between the academia and the industry. Several eminent international and national

experts participated and presented their novel findings. Eminent cardiovascular scientists, cardiologists and cardiothoracic surgeons of national and international repute participated in this conference and interacted on a common platform to evolve sustainable solutions to mitigate dire consequences of cardiovascular pathophysiology. The conference included sessions on basic and clinical sciences and deliberated on the recent developments in disorders like hypertension, heart failure, ischemic heart disease, myocardial infarction, arrhythmias, metabolic syndrome, cardiovascular complications of diabetes, atherosclerosis, vascular abnormalities etc. Keeping in mind the recent global trends, interactions between traditional and modern medicines and the role of medicinal plants and nutraceuticals in the area of cardiovascular disorders were given due emphasis in the scientific programme. Experts, delegates and resource persons from across the world viz. Canada, USA, and Europe, in addition to eminent experts from India participated in this epic meeting. Prof. Arunabha Ray, Director-Professor, V.P. Chest Institute



The conference venue (Golden Jubilee Auditorium, VPCI) and Inaugural function (lighting of lamp and welcome of dignitaries)

was the Organizing Chairman, and Prof. Kavita Gulati of the same institute was the Organizing Secretary for the conference. Prof. K. Ravi, Head, Dept. of Physiology, VPCI, was the Co-Chairman and Prof. S.N. Gaur, Director of the VPCI was one of the Patrons.

The conference was inaugurated on 09/2/2017 by none other than Prof. P.N. Tandon, Padmavibhushan (one of the highest civilian awards of India) and a stalwart and visionary in the field of medical education and research in India, who was the Chief Guest on the occasion. Prof. Naranjan S. Dhalla, Executive Director, IACS (Winnipeg), and Prof. Ramesh Goyal, Hon'ble Vice Chancellor of DPSRU, New Delhi, were also the Guests of Honor for the inaugural function.

The other dignitaries on the dais - Prof. C.C. Kartha, President-IACS (India Section), Trivandrum, Prof. S.N. Gaur, Prof. Arunabha Ray, and Prof. Kavita Gulati, accompanied them for lighting of the lamp.

Several luminaries in the field of cardiovascular sciences and medical sciences in general were present in the audience to grace the occasion. Prof. S.N. Gaur, welcomed the guests and wished the delegates a fruitful experience at the conference in Delhi. Prof. Arunabha Ray, introduced the conference and apprised the delegates and faculty about the scientific content of the



Felicitation of (Upper L to R): Prof. N.S. Dhalla, Prof. P.N. Tandon, Prof. R.K. Goyal, (Lower L to R): Prof. C.C. Kartha, Prof. A. Ray by Prof. S.N. Gaur and Prof. Kavita Gulati by Prof. R.K. Goyal at the inaugural session

meeting. He highlighted the interdisciplinary nature of the conference, its translational significance and its contemporary relevance for health and disease. Prof. C.C. Kartha, highlighted the role of IACS (India Section) and gave an overview of its activities. Prof. N.S. Dhalla and Prof. R. Goyal also welcomed the delegates from India and abroad. They highlighted the significance of this meeting in today's healthcare scenario, and wished the meeting a grand success. The Chief Guest, Prof. P.N. Tandon, in his keynote address, apprised the audience about the importance of the academy and the need for such conferences for the advancement of knowledge in the field and

congratulated the institute and the organizers for making this effort. The inaugural IACS Newsletter (India Section) and the conference Souvenir were released by the dignitaries and this was applauded by the audience.

Prof. Kavita Gulati, delivered the vote of thanks and gratefully acknowledged all distinguished luminaries on and off the dias, faculty, delegates, volunteers, and sponsors. This was followed by high tea.

The scientific programme of the IACS-2017 conference, which spanned over 03 days (9, 10 and 11 February, 2017) consisted of Plenary lectures, Orations, Symposia on topics of contemporary relevance, and free communication sessions. There were several award sessions for encouragement of young scientists, viz. Prof. Devendra Agrawal Award, Prof. Suresh C. Tyagi Award, Prof. N.S. Dhalla Award (Posters) and Prof. C.C. Kartha Travel Awards. The applicants for the



Inaugural function - Addresses by Prof. P.N. Tandon, Prof. N.S. Dhalla, Prof. R.K. Goyal and Prof. C.C. Kartha; and Release of IACS Newsletter and IACS-2017 conference souvenir

various awards were meticulously screened by a committee constituted by the IACS Executive who selected the finalists for presentations. The four orations were Prof. S.K. Gupta Oration, Prof. R.K. Goyal Oration, Prof. H.S. Buttar Oration and Prof. Rakesh Kukreja Oration. The conference participants included: Prof. N.S. Dhalla, Prof. Pawan Singal, Prof. H.S. Buttar (all from Canada), Prof. Suresh C. Tyagi, Prof. Rakesh Kukreja and Prof. Sushil Jain (all from USA), Prof. Andras Varro and Prof. Istvan Baczko (Hungary). In addition reputed Indian stalwarts included Dr. V. Mohan (Chennai), Dr. O.P. Yadava (New Delhi), Prof. Balram Bhargava (New Delhi), Prof. S.K. Gupta (New Delhi), Prof. S.S. Agrawal (New Delhi), Prof. S.K. Maulik (New Delhi), Prof. Madhu Khullar (Chandigarh), Dr. Biju Soman (Trivandrum), Dr. T.F. Ashavaid (Mumbai), Dr. S.L. Sitaswad (Pune), Prof. R.K. Goyal (New Delhi), Dr. Ishwar N Acharya (New Delhi), Prof. V. Adepalli (Mumbai), Prof. M. Fahim (New Delhi), Dr. Jaideep Bhaduri (Mumbai), Dr. Anita Mehta (Ahmedabad) and Dr. Tejal Gandhi (Anand), Dr. Ipseeta Roy Mohanti (Mumbai), Dr. Pawan K Singh (Ahmedabad), Dr. Seema Bhargava (New Delhi), Dr. Zahid Ashraf (New Delhi), Prof. C.C. Kartha and Dr. Surya Ramachandran (Trivandrum), Dr. Sankar Natesan (Madurai), Dr. S.R. Kalpana (Bangalore), Dr. M.K. Barthwal and Dr. Kashif Hanif (Lucknow), Prof. K Ravi and Prof. S.K. Bansal (VPCI, Delhi), Dr. Trupti Rekha

Swain (Cuttack) actively participated in the scientific deliberations of the meeting.

The scientific programme of the IACS-2017 was initiated with a Plenary Lecture by Prof. N.S. Dhalla on “CO₂ water-bath therapy promotes blood flow and angiogenesis in diabetes with peripheral ischemia” in which he highlighted totally new concept in diabetes induced cardiovascular pathophysiology. He was honored with a plaque in recognition of his contributions to cardiovascular sciences and the IACS.

This was followed by the prestigious Prof. S.K. Gupta Oration which was delivered by Prof. Pawan K Singal (Winnipeg, Canada), who spoke on “Toll like receptors and innate signaling in heart failure”. Prof Singal highlighted the importance of toll like receptor mediated signaling in heart failure – a new concept in the area of the emerging interactive concept of immunocardiology. He was presented with the Oration award of Rs.15,000/-, a plaque and a certificate.

The day long scientific deliberations were followed by a cultural programme in which a highly reputed dance troupe presented a set of classical Indian dance items. This mesmerizing performance was very relaxing for the delegates and was hugely applauded by the audience.



General audiences at the IACS-2017 conference. Prof. N.S. Dhalla is honored by Prof. S.N. Gaur, (Upper Right) Prof. P.K. Singal delivering the Prof. S.K. Gupta Oration and being felicitated for the same (Lower Panel).

The scientific deliberations of 10 February began with two prestigious orations, viz. Prof. R.K. Goyal Oration and Prof. H.S. Buttar Oration. Prof. R.K. Goyal Oration was delivered by Prof. O.P. Yadava, a reputed cardiac surgeon, who spoke on “You Young Scientists - History is a Friend, Philosopher & Guide”. This was a revealing discourse of historical events in medical sciences and their impact on the current therapeutic scenario. He urged the young scientists to peep into history and prepare for the future by courage of conviction. The Prof. HS Buttar Oration was delivered by Dr. V. Mohan (Padmashree), an internationally renowned diabetologist with immense contributions in the field of community medicine with reference to diabetes. He spoke on “Diabetes can be prevented but we all have to work together” and gave a detailed description about the various steps taken to translate basic research and clinical observations in diabetes to community service and to provide specialized diabetic care in rural India. He emphasized the importance of working together to tackle this looming menace. Both orators were presented with the Oration award of Rs.15,000/-, a plaque and a certificate.

Symposium 1: Epidemiology of cardiovascular disease

The next symposium was on Epidemiology of cardiovascular diseases. Dr. Biju Soman (Trivandrum) initiated the proceedings with an illuminating talk on how Information Communication Technologies (ICT) can improve the quality of field research with reference to epidemiology of cardiovascular diseases. This was followed by a very lucid presentation by Dr. T.F. Ashavaid (Mumbai) on “Genetic determinants of atorvastatin response as lipid lowering agent in the Indian population”, which was followed by prolonged interactions on the topic.

Symposium 2: Cardiovascular complications of Diabetes mellitus: An update-1

Next in line was a Symposium on an Update on cardiovascular complications of diabetes mellitus, in which the first talk was on “Mitochondrial peroxiredoxin-3 protects against hyperglycemia induced myocardial damage in diabetic cardiomyopathy” by Dr. S.L. Sitasawad (Pune). She explicitly highlighted the protective role of mitochondrial peroxiredoxin-3 in this cardiac complication. In the following talk, Prof. Ramesh Goyal (DPSRU) spoke on “Role of inflammation in diabetes and its complications” and gave a concise and explicit general overview of the role of immunoregulatory cytokines on cardiovascular and other associated events during type-2 diabetes mellitus. The next lecture was on “Role of fibrosis associated transcription factors in hyperglycemia induced endothelial to mesenchymal transition” by Dr. Madhu Khullar

(PGIMER, Chandigarh). She very lucidly emphasized the influence of high glucose as a potent stimulus of cardiac microvascular endothelial to mesenchymal transition.

Symposium 3: Traditional medicine in cardiovascular disease

In view of the increasing interest and developments in the area, two symposia were exclusively planned for the impact of traditional medicinal systems and medicinal plants in heart disease. In the first session, Prof. Harpal Buttar (Ottawa, Canada) gave an enlightening discourse on the herb-drug interactions and role of nutraceuticals as therapeutic agents in cardiovascular disorders. Prof. S.K. Maulik (AIIMS, New Delhi) next highlighted the potential of *Terminalia arjuna* in pulmonary hypertension and suggested how his research findings could be translated to therapeutics. The subsequent talk by Dr. Ishwar N. Acharya (CCRYN, New Delhi) proposed a positive role for Yoga and Yogic interventions in prevention and treatment. He gave an overview of the great potential that this form of therapy could have in both health and disease.

Symposium 4: Novel strategies in cardiovascular therapeutics-1

In the first session, Prof. V. Addepalli (NMIMS, Mumbai) started the proceedings by a highly innovative discourse on “Angiogenesis in cardiovascular therapeutics – a regenerative approach”, which generated a lot of interest in the audience and meaningful interactions followed. In the next talk, Prof. M. Fahim (Ex-VPCI, Delhi) described his experimental findings with the lipid reducing herbal compound Lipotab and consequent improvement cardiovascular functions in isoprenaline induced heart failure – a study which could have immense translational impact. In the final talk of the session, Dr. Jaideep Bhaduri (Lupin Ltd, Mumbai) gave a totally different viewpoint about the newest synthetic molecules that had great potential in cardiovascular diseases and were in different stages of drug development.

Symposium 5: Phytopharmaceuticals as cardioprotective agents

This was the second session on natural products on Phytopharmaceuticals and cardiovascular disease. Prof. Anita Mehta (LMCP, Ahmedabad) presented her research findings on the cardioprotective effects of capsaicin and showed that this nutraceutical protected against ischemic myocardial damage by activating ATP dependent K channel, increasing nitric oxide, decreasing oxidative stress in heart and platelets, and that these actions are independent on the stimulatory actions of capsaicin on the cardiorespiratory afferent nerve. In the next presentation, Prof. Ipseeta Roy Mohanti (Mumbai)

showed that *Terminalia arjuna* treatment demonstrated significant antidiabetic as well as myocardial salvaging effects and attributed this effect to DPP- IV inhibition, hypolipidemia, reduced atherogenic potential, anti-thrombotic state, anti-inflammatory and antioxidant properties. The final talk in this session was delivered by Dr. Pawan K Singh (NIF, India), who pioneered to explore the role of grassroots and traditional knowledge in the prevention and treatment of cardiovascular disorders – a relatively novel concept which was extensively discussed.

Symposium 6: Emerging trends in ischemic heart disease

Ischemic heart disease was one of the major focuses of the scientific deliberations and a special symposium was allocated for this purpose. Dr. Rakesh C. Kukreja (USA) made the opening presentation in this session by his novel concept in the talk entitled “PDE5 inhibition protects diabetic heart against ischemia/reperfusion injury” where he showed that chronic treatment with tadalafil protected against I/R injury in diabetic heart through mechanisms which blunt inflammation and activate NO-induced Sirt1/PGC-1 α signaling, and conclude that tadalafil could be an attractive therapy for reducing cardiovascular risk factors while providing cardioprotective effect in diabetic patients. Following this, Prof. Suresh C. Tyagi (USA) presented his talk on “Exercise and nutrition in myocardial matrix metabolism, remodeling, regeneration, epigenetics, microcirculation, and muscle” and proposed that epigenetic silencing could be an important therapeutic target and proposed the importance of personalized medicine is the future of therapy in a variety of heart diseases. In the final talk of this session, Dr. Seema Bhargava (New Delhi) highlighted the role of the laboratory in acute coronary syndrome with emphasis on history and current perspectives. She suggested that in view of her recent experience with the newer biomarkers, a modified algorithm for early diagnosis of chest pain based on the inclusion of hs-trop-I as an initial marker and the time of presentation of the patient in the emergency department. This could have a great impact on the diagnosis, management and prognosis in cases of acute MI.

Symposium 7: Newer concepts in cardiovascular pathophysiology-1

In another symposium on cardiovascular pathophysiology linked pharmacotherapy, Dr. C.C. Kartha (Trivandrum) started the proceedings with a talk on “Tetralogy of fallot (TOF): molecular defects in the cardiac right ventricle outflow”, where he showed that premature differentiation of progenitor cells, their ectopic accumulation in the outflow tract and maladaptation of right ventricle to

hemodynamic stress could contribute to the increased muscle mass and the resultant RVOT obstruction in TOF. Following this, Dr. Zahid Ashraf (New Delhi) highlighted the importance of Inflammasome as a new paradigm in cardiovascular diseases. He presented his pioneering research to demonstrate that NLRP3 inflammasome mediated sterile inflammatory pathway triggered the thrombotic outcome in response to hypoxic environments. Dr. Istvan Baczko (Hungary), in his next presentation on “A transgenic rabbit model with impaired repolarization reserve for more reliable prediction of cardiac arrhythmias” showed that transgenic LQT5 rabbits exhibited increased susceptibility to drug-induced arrhythmias and may represent a useful model for more reliable testing of pro-arrhythmic potential of compounds in development. In the final talk of this innovative session, Dr. S.R. Kalpana (Bangalore) in her lecture “Pharmacogenetics of oral Anticoagulation therapy” and suggested that the future of safe and effective oral anticoagulation therapy depended on genetic studies identifying additional polymorphism, if any, responsible for dose variations, developing rapid and cost effective methods of genotyping and developing a personalized dosing algorithm using pharmacogenetic data and other variables like age, concomitant medications and co-morbidity. This ended the scientific proceedings of day 2, i.e. 10/2/2017.

Symposium 8: Novel strategies in cardiovascular therapeutics-2

In the next scientific symposium on the same general theme, classical yet novel pharmacological approaches to cardiovascular diseases were discussed. Prof. Andras Varro (Hungary) commenced the proceedings with a state of the art presentation on “Natrium/calcium exchanger (NCX) as potential therapeutic target in the heart” where he highlighted the effects of the highly selective NCX-inhibitory activity of ORM-10962, and further suggested that specific inhibition of the NCX current influences Ca-handling and contractility in a mode dependent manner and also contributes to the prevention of cardiac arrhythmias in vivo. Dr. Sankar Natesan (Madurai) followed with his talk on “Therapeutics against cardiac remodeling – “InsP3R-ing” target” and demonstrated that the InsP3R2 specific peptide and the antibody inhibit cellular hypertrophy in- vitro. He further evaluate using different heart targeting recombinant peptides and scFv (single chain) antibodies in adult cardiomyocytes and rabbit models. Dr. Tejal Gandhi (Anand) concluded the exciting session by her innovative research presentation on “Ibuprofen exerts cardioprotective effect through inhibition of RhoA/ROCK pathway on isoproterenol-induced myocardial damage in rats” where she showed that the cardioprotective effects of ibuprofen could be attributed to the improvement in LV dysfunction, cardiac



Dr. V Mohan (Chennai) delivering the Prof. H.S. Buttar Oration and being felicitated (Upper Panels) and Dr. O.P. Yadava (National Heart Inst., New Delhi) delivering the Prof. R.K. Goyal Oration and being felicitated (Lower Panels)

systolic/diastolic dysfunction and myocardial fibrosis, and further suggested that ROCK pathway could be a possible therapeutic intervention for prevention and treatment of myocardial infarction.

Meeting of the Governing Council of IACS (India section)

This was held on 10 February, 2017 at 6 PM. Prof. C.C. Kartha, president IACS (India section) welcomed the members and Dr. Surya Ramachandran apprised the audience about the activities of the academy. Several members expressed their views and praised the academy for its contributions to science and society. All national and international delegates including Prof. N.S. Dhalla, Prof. Rakesh Kukreja, Prof. HS Buttar and Prof. Suresh Tyagi were present. Dr. S Natesan, organizing chairman of the next IACS meeting cordially invited all to Madurai in February, 2018.

Special IACS-2017 Award Ceremony

In the evening, the organizers arranged a lavish banquet in Oberoi Maidens near the venue of the conference. At the start, Prof. Arunabha Ray (Organizing Chairman)

welcomed the faculty and guests and invited Prof. N.S. Dhalla and Prof. C.C. Kartha to initiate the proceedings.

A special IACS awards ceremony was organized prior to the dinner in which the following awards were given to the distinguished awardees by the IACS Executive:

1. **Prof. S.K. Gupta Oration Award** to Prof. Pawan Singal (Winnipeg, Canada)
2. **Prof. R.K. Goyal Oration Award** to Dr. OP Yadava (National Heart Instt, New Delhi)
3. **Prof. H.S. Buttar Oration Award** to Dr. V Mohan (Chennai)
4. **Prof. Rakesh Kukreja Oration Award** to Prof. Balram Bhargava (AIIMS, New Delhi)

All the awardees were handed over a special plaque and a Cheque for Rs. 15,000/- on behalf of the IACS by Prof. N.S. Dhalla, Prof. S.K. Gupta and Prof. C.C. Kartha. All awardees made brief speeches and thanked the IACS for bestowing upon them this rare honor.

In addition to these, the following were also honored with special IACS awards:

Prof. Kavita Gulati (Organizing Secretary, IACS-2017) was honored with the *Distinguished Service Award in Cardiovascular Sciences, Medicine and Surgery*

Prof. Arunabha Ray (Organizing Chairman, IACS-2017) was honored with the *Distinguished Leadership Award in Cardiovascular Sciences*

Prof. Andras Varro (President, European Section of IACS) was honored with the *Makoto Nagano Award of the IACS* for his outstanding contributions in the field.

All the awardees were introduced by Prof. N.S. Dhalla and Prof. C.C. Kartha. The awardees were requested to make brief speeches. They thanked the IACS for bestowing upon them this rare honor.

The scientific proceedings of day 3 i.e. 11/2/2017 were mainly devoted to an oration and two important award sessions for Young Investigators (Research Scholars and Faculty). At the outset, Prof. Balram Bhargava, eminent cardiologist (AIIMS, New Delhi) delivered

the Prof. Rakesh Kukreja Oration on “Frugal innovation for healthcare in India” where he aptly described the importance of innovation in development of health care in India. This was followed by the Prof. Devendra Agrawal Young Investigator Award Session, in which four selected young doctoral/postdoctoral researchers presented their research work in front of the honorable judges and spellbound audience. Following a brief tea break, it was time for the much awaited Prof. N.S Dhalla Poster Award Session in which more than 60 young scientists presented their posters and competed for 4 coveted awards. Eminent scientists acted as chairpersons and judges for this session. This was followed by lunch. The post-lunch session commenced with the Prof. Suresh C Tyagi Award Session (for Young Faculty) wherein young faculty members in the initial phases of their careers apprised the gathering about their research in the field of cardiovascular and allied sciences. Eminent scientists chaired also both these sessions.



Prof. Kavita Gulati being honored with the Distinguished Service Award in Cardiovascular Science, Medicine and Surgery, (Upper Left) and Prof. Andras Varro being honored with the Makoto Nagano Award of the IACS for his outstanding contributions in the field (Upper Right). General audience at the meeting (Lower Panel)



Prof. Arunabha Ray being honored with the Distinguished Leadership Award in Cardiovascular Sciences, (Left) and Prof. Rakesh Kukreja Oration was presented to Prof. Balram Bhargava, (Right)

Symposium 9 and 10: Cardiovascular complications of Diabetes mellitus: An update-2 and Newer concepts in cardiovascular pathophysiology-2

In the first symposium, Dr. Surya Ramachandran (Trivandrum) spoke on “Cyclophilin A promotes atherogenesis in high glucose conditions” in which she highlighted that Cyclophilin A was secreted from high glucose activated monocytes and could be detected in plasma of patients with type 2 diabetes and associated coronary artery disease. Secondly, it accelerated early atherogenesis by increasing monocyte adhesion, transmigration and differentiation into macrophages leading to increased lipid uptake. She found that cyclophilin A upregulates scavenger receptors and increases redox activity as well as levels of proinflammatory cytokines leading to increase in lipid uptake by macrophages. In the next talk, Dr. Sushil K Jain (USA) spoke on Vitamin D-deficiency, insulin resistance and risk of cardiovascular disease in type 2 diabetes. He suggested that combined supplementation with low dose VD and LC and an improvement in VD regulatory genes status was a better and safer approach

for increasing blood levels of 25(OH) VD and reducing IR and CVD in a population at risk for 25(OH) VD-deficiency/inadequacy. This was followed by a very interesting talk by Dr. Trupti Rekha Swain (Cuttak) on “Higher dose of atorvastatin favours development and progression of type-II diabetes mellitus”. She showed that atorvastatin induced glucose intolerance was positively associated with increasing age, female sex, and obesity, and this was more marked in patients who have other preexistent risk factors for diabetes. In the final talk Dr. M.K. Barthwal (CDRI, Lucknow) spoke on “Role of Interleukin-1 receptor associated kinase in vascular remodeling” and demonstrated the role of IRAK in Angiotensin II induced vascular smooth muscle cell proliferation and remodeling.

The Valedictory Session of the conference was attended by the delegates who waited patiently to know the results of the various award sessions. Prof. N.S. Dhalla, Prof. C.C. Kartha, Prof. Arunabha Ray and Prof. Kavita Gulati presented their individual views on the conference and thanked all delegates, faculty, volunteers and sponsors for making this meeting a reality.

The recipients of the various awards were as follows:

- Prof. Devendra Agrawal Young Investigator Award: M. Kiranmayi (1st), Harikesh Dubey, Vikas A and Nikita Setia
- Prof. Suresh C. Tyagi Award: Dr. Vibha Rani (1st), Dr. Kashif Hanif, Dr. Suman Kundu and Ms. Hital Shah
- Prof. N.S. Dhalla Poster Awards: Ms. Jaya Mary Thomas, Dr. Kumaravelu Jagavelu, Ms. Aditi Jain, Ms Vinitha A
- Prof. C.C. Kartha Travel Awards: M. Kiranmayi, Ms Vinitha A, Ms. Jaya Mary Thomas, Mr. Jaganmay Sarkar, Mr Vikas A, Ms. Nimmy Mohan, Mr. Moon Jain, Ms. G. Lakshmi Lavanya, Ms. Aditi Jain

All awardees were called on stage by the dignitaries on the dias and handed over the certificates and award money (Rs. 5000-1000/-).



Prof. Devendra Agrawal Young Investigator Award recipient, M. Kiranmayi (Left), Harikesh Dubey, Vikas A and Nikita Setia being awarded (Right)



Prof. Tejal Gandhi & Dr. Seema Bhargava (Left). Prof. Suresh C. Tyagi Award (Young faculty) recipient, Dr. Vibha Rani with all awardees and faculty (Right)



Prof. N.S. Dhalla Award poster presentation session and the awardees with faculty



Prof. C.C. Kartha travel award was given to 9 young scientists

Finally, national and international faculty volunteered to come on stage and give their impressions on the conference. All of them unanimously praised the quality of the scientific programme and expressed their gratitude for the kind hospitality extended to them during their stay. Prof. N.S. Dhalla, Prof. C.C. Kartha, Prof. H.S. Buttar, Prof. Rakesh Kukreja, Prof. Suresh Tyagi, Prof. V. Addepalli, Dr. Surya Ramachandran and many others applauded the efforts of the organizers for such an excellent conference and gave a standing ovation to the organizing team of IACS-2017. The Organizing Chairman and Organizing Secretary, thanked all delegates, faculty and all others assisting in the conference and wished them all the very best for a safe trip back to their respective organizations.

In summary, the IACS-2017 conference of New Delhi was a state of the art scientific event which provided an ideal platform for brainstorming interactions between basic medical scientists, and clinicians from academia, industry and other professional organizations. Both young and experienced scientists actively contributed to the innovative and updated scientific deliberations. This resulted in advancement in and dissemination of knowledge in the field of cardiovascular sciences aimed at prevention and treatment of heart disorders. The conference also laid the foundation for several meaningful collaborations between institutions and individuals and set an example for more such events in the future.



International delegates, IACS executives and the organizing team of the IACS-2017 conference

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Life Style and Life Style Diseases: S. Sivasankaran

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Dr. S. Sivasankaran

Life style is the way we live. All humans are born the same. We suck at the breast and sleep well cared by the mother. Then we develop our life styles, based on our culture, religion, overpowered by the industry driven advertisements and peer pressure. We love to be identified as the ----boy or the ----baby, taller, smarter

and what not. If such a life style leads to diseases are we committing suicide? Or by encouraging our children to adopt the modern life full of stress and risks are we committing homicide? An ideal life style should enable us to live our full biological potential in the most adapted way to our environment. When our body systems evolved in nature, nature never expected us to extract salt from the sea, sugar from sugar cane, oil from oil seeds, nor fruit juices and alcohol. Deep frying and sumptuous feasting on the industry driven products, which have a long shelf life and indulgence in the use of tobacco and alcohol, have generated the new epidemic on non-communicable diseases as the Killer disease of Mankind. To tackle this, the United Nations has put forward the target of one third by 2030 as an integral part of the sustainable development goal (SDG).

Mission one third by 2030

As the statistics goes, two third of the present day hospitalisations and mortality at the younger age below the age of 70 years are related to life style factors which lead to what are called non-communicable diseases (NCDs). The four life style factors are unhealthy diet, physical inactivity, tobacco use and unhealthy use of alcohol. The diseases they lead to are broadly put under the group of cardiovascular diseases (stroke, heart attack), diabetes, cancers, and lung disease. The target that is now

put forward is to achieve a one third reduction in premature death related to these diseases globally by a 9-point action by the participating 194 Nations which is



Figure 1. Nine aspects of the global target for Non-communicable disease control initially proposed which is the fore runner of the one third by 2030 Mission adopted for ensuring healthy lives and to promote well-being for all at all ages, as the integral component of United Nations Sustainable Development Goals.

actually the extension of the 25 by 25 global target, figure 1, adopted earlier for NCO control. India had modified this into a 10-point agenda by including efforts to reduce air pollution along with its massive National Programme For Prevention and Control of Cancer, Diabetes, Cardiovascular Disease and Stroke (NPCDCS). To achieve this, we need a mass movement of community education and action. Kerala with its enlightened public, and its model of good health at low cost could lead the nation and the world in this context.

Timing is the key

The best example of the diet life style interaction is the honey bee. All honey bee larvae are born the same. Those

larvae fed on pollen develop as the short lived impotent worker bee and those fed on Royal jelly develop as the Queen bee with 20 times more longevity and good fertility. Similarly, nature has one goal in potentiating growth. The species should be at its best when they parent a baby. After parenting, the species slowly, enter the phase of senescence. Hence the younger age onset of non-communicable diseases does represent premature aging and maladaptation to the industry driven modern life style. Therefore, the best investment to avoid premature aging is to achieve your best at peak adolescence. Rough estimates show that tobacco is one product which guarantees that half the users will die due to a disease attributable to tobacco use. One cigarette ensures 10 minutes of your life to a hospital and one Kg of additional body fat over your best body weight at peak adolescence will ensure 3 months of your life to a hospital bed.

Who is at risk?

Younger age escalation of risk factors and diseases in India and Kerala clearly point to the fact that women and children suffer the brunt of damage due to the changing life style. Traditionally use of tobacco and alcohol consumption is the least in this sub group. Hence unhealthy diet and physical inactivity are the key drivers for the development of risk factors for non-communicable

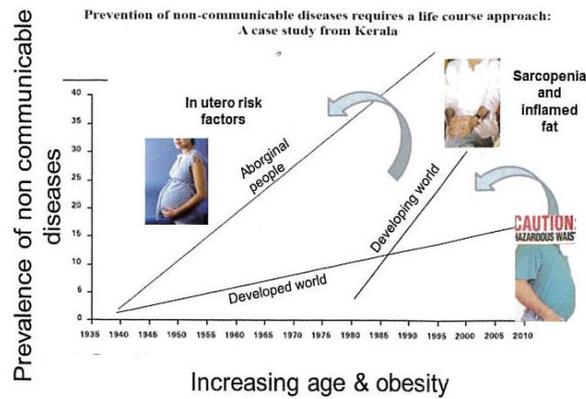


Figure 2. Three patterns of increase in non-communicable disease in relation to age and body weight are observed in the world. In developed world, increasing age and obesity accounted for the majority, and in the developing world people developed the diseases because of less skeletal muscle (sarcopenia) and abnormal fat accumulation without becoming overtly obese. Younger age escalation is propelled further by the in-utero programming when the pregnant mother develops the risk factors and diseases like obesity, diabetes, hypertension and vitamin D deficiency. (IJMR 2013; 137:874-877)

diseases in this age group. In the last 3 decades, gestational diabetes in women in the reproductive age group has increased 4 times, obesity now affects one third of the Kerala women, and polycystic ovarian diseases

affects 10 -15% of adolescent girls. Vitamin D deficiency affects 2/3rd of the women in the reproductive age group. Breast cancer incidence in this age group is steadily increasing. Thus, the vulnerable group in society, namely women and children, are at the greatest risk, and physical inactivity is thrust upon them by the ever- increasing academic pressure, and lack of enabling environment for physical activity. Recent follow up of children born in the New Delhi birth cohort documented the incidence of these diseases in India. In the last decade, the incidence of obesity, hypertension, and diabetes between the ages of 29 to 36 years were 2%, 2-4% and 0.5 to 1% per year among women and men respectively. Figure two pictorially represents the trends in non-communicable diseases in relation to age obesity, physical inactivity and development of risk factors in the pregnant mother.

Go red for women

Go Red For women represents the public health movement initiated by American Heart Association, in 2000 specifically aimed at reducing the heart disease and risk factor burden in women. This is all the more relevant for developing countries like India. Three patterns of increase in non-communicable disease is documented as shown in Figure 2. The first pattern seen in developed countries documented increase in these diseases with advancing age and increasing obesity. The second pattern seen in the developing world showed younger age escalation of risk factors and diseases out of proportion to increase in obesity where rapid urbanization and growing physical inactivity played a major part. These two patterns are further worsened by the in-utero programming, when the prospective mothers harbour the disease risk factors which pre-dispose for early onset of the disease and risk factors in the offspring. Both maternal diabetes and vitamin deficiency are now documented to herald early onset of non-communicable diseases in the offspring from

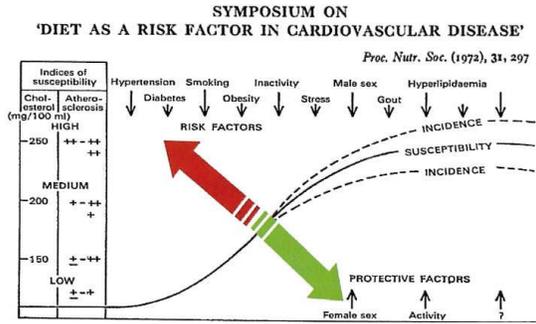


Figure 3. Community susceptibility and incidence of coronary artery disease as put forward by the Nutrition Society Symposium in 1972, (Shaper AG. Proc Nutr Soc 1971;31:297) which highlighted the concept of tracking of higher childhood values of blood pressure, obesity and blood cholesterol to early onset of adult diseases and increasing incidence of non-communicable diseases. The picture essentially stresses the need for childhood prevention strategies to be adopted universally to achieve the one third by 2030 target.

the Mysore birth cohort follow up study. Integration of non-communicable disease control with the reproductive and child health program could turn out to be the optimal strategy for prevention of younger age onset of risk factors and diseases in the developing countries. The two risk factors that needs to be targeted in this age group are unhealthy diet and physical inactivity. Further efforts at encouraging physical activity and healthy diet in this age group is likely to penetrate the whole family. At present, there is a legal ban on sale of tobacco products and alcohol to children and adolescents below the age of 18 years. It is equally important to implement salt, fat, sugar and soda taxes to reduce the consumption of these industry driven products by children to prevent the early onset of risk factors. The present efforts in India, like fat taxes in Kerala and taxes on fried items in Bihar and the

banning of sale of Junk food at schools by the Delhi, Odisha and Punjab governments are key health reforms. Banning of junk food sales in schools essentially resulted because of the legal efforts by the Uday foundation. These efforts follow the initial 1972 prescription from the symposium on dietary prevention of non-communicable diseases which highlighted the lower the better concept with respect to blood pressure, blood cholesterol levels and body weight as seen in Figure 3. Recent studies on childhood prevention of adult onset diseases like the STRIPS study which restricted salt and fats to children from weaning provides scientific support to this concept. Healthy motherhood and achievement of best health at peak adolescence, thus turns out to be the best investments for achieving the one third by 2030 target.

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What is New in Strategies for Cardiac Regeneration?: K. G. Aghila Rani

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Dr. K.G. Aghila Rani

Human body is built to heal itself by replacing devitalized and missing cellular structures or tissue layers. When cells in the human body are damaged, the process of repair begins immediately. The chain of events initiated ends only when the damaged area is brought back to normal pre injured state. New cells may replace old cells. The

sequence of events involves a series of functional changes and a fine balance among these events is crucial for the survival and necessary actions of the human body. In most of the cases, the healing phase is initiated by the renewal and replacement of worn out cells by new dividing functional cells. Most organs in the human body are repaired in this way. Heart is an exception; cells of the heart are not easily replaced by new cells.

Heart is one of the 5 vital organs and is assigned with the role of pumping blood and essential nutrients throughout the body. Heart is the first organ to form during the development of the fetus; its relentless muscular activity

makes heart stand out from other organs. Cells of the heart are unique. It is interesting that the same set of muscle cells (cardiac muscles/cardiomyocytes) keeps the heart beating right from the time of one's birth till death. Any injury to the heart, can wipe out 25% of its cardiomyocyte pool within a few hours, resulting in a notable reduction in the pumping efficiency of the heart. Mammals are not equipped with the natural capacity to replace heart muscles that are lost by injury. Once damaged, these cells would be replaced by a collection of dead cells (tissue) or a scar instead of fresh cells, eventually leading to heart failure and death depending on the extent of injury. Heart failure is mostly managed with medicines, while in certain instances implantation of mechanical pumps (ventricular assist devices) is required to maintain blood flow. Another choice is replacing the diseased heart with a healthy heart from another donor individual who has died (heart transplantation). All these strategies have limitations. Hence researchers have been attempting to find new treatment approaches. One approach is to find ways to grow new heart cells or make healthy heart cells to divide and multiply.

Extrapolating the observations made in experiments in small organisms and animals, researchers have been able to identify and show regenerative or cell renewal

responses in human hearts as well. Recent studies demonstrated that mammalian hearts retain an inborn regenerative capacity for cardiomyocyte turn over throughout life. These findings have challenged the long standing dogma that heart is an organ without cell turnover or renewal potential. The discoveries in field of heart regeneration have new impetus to find new ways to treat heart failure.

Current experimental approaches to vitalize an injured heart by having more healthy muscle cells can be mainly categorized under three heads: stem cell therapy, cellular reprogramming and tissue engineering. Exciting progress has been made in the field of cardiac repair with advances in stem cell biology, cell transplantation techniques, developmental biology and biomaterials. Stem cells are stock cells capable of giving rise to indefinitely more cells of the same type. Cell transplantation therapy involves external delivery of corrective cells to the injured heart by delivery of cells through the coronary artery that supplies blood to the heart or by direct injection of cells into heart. This idea was borne out with the understanding in stem cell biology, and the vast potential of stem cells in dividing and replacing worn out cells of the body. The thinking was that if the residing stem/progenitor cells in an adult are capable of producing new heart cells, the delivery of stem cells might speed up the generation of a complete functional heart muscle tissue. Various adult stem cell types obtained from bone marrow heart, fat tissue, supporting tissue (mesenchymal stem cells), and skeletal muscle were evaluated for their potential to restore the lost heart muscle cell pool in the injured heart. With the success in studies in experimental animals, heart repair has moved rapidly into clinical trials involving patients. Clinical trials involving bone marrow stem cells, revealed a moderate improvement in the pumping efficiency of the heart. The efficiency was however, considerably less owing to the extent of dead tissue formed in the injured heart. Use of certain activator factors such as erythropoietin and granulocyte colony stimulating factor which would mobilize one's own or the inherent stem cell pool to the site of injury was also attempted in clinical trials of cardiac regeneration.

Cellular reprogramming, technique of converting one specific cell type to another, based on the pioneering work by the 2012 Physiology and Medicine Nobel laureates Gurdon and Yamanaka, was suggested as a possible alternative for cell transplantation therapy and also heart repair. In this approach, the dead tissue- forming cells called the fibroblasts (the most prevalent set of cells found in the heart), were reprogrammed to functional heart muscle cells (cardiomyocytes), in a process termed 'transdifferentiation'. Certain crucial genes responsible for the cardiac myocyte genetic makeup (like transcription

factor, Myo D) were overexpressed in the fibroblast cells making them transformed into cardiomyocytes. With the advent of more sophisticated methods in gene modification, scientists used combinations of transcription factors and generated much efficient cardiomyocytes from cardiac fibroblast cells. The fibroblast transformed cardiomyocytes, however, showed only 1% success in exhibiting spontaneous beating, the characteristic feature of cardiomyocytes. Active research is progressing in this area in order to utilize this approach to coax the failing heart to recover.

Tissue engineering, technique of growing functional tissues on porous, biodegradable meshes made of plastics (polymers), is yet another effective approach in regenerative therapy. Cardiomyocytes obtained from young animals or stem cells are used in preparing assemblies of engineered heart tissues. These constructs after proper conditioning could be sutured into injured adult hearts. Better contractile function was observed in the engineered heart tissues with good establishment of electrical connectivity with the surrounding viable heart tissue. Clinical studies are due although success has been reported in a handful of animal studies.

Another ground breaking discovery in the field of regenerative medicine is the 3-0 printing technology, in which human organs are created using a highly specialized and unique printer. Beating three dimensional mass of heart cells (termed organoids) were created in the laboratory using specialized heart cells using this technique. The research team is using an adapted version of ink-jet printing technology to print these artificially engineered heart tissues. The field is growing with varied applications in complex cardiovascular diseases and also many other surgical and interventional procedures.

The growing field of cardiac regeneration has potential benefits in treating millions affected by cardiovascular disorders, the leading cause of death and hospitalization around the world. Although adult heart renew naturally, the process is very slow and is clearly not enough to repair the damage caused by a heart attack. From the first repair in 1953 of a defect in the heart septum, followed by successful heart transplant in 1967 and the first infusion of bone marrow- derived cells to the human myocardium in 2002, researchers have come a long way and developed several promising strategies for treating heart diseases. These strategies may eventually reveal novel possibilities for treating patients by turning on the heart's own repair mechanisms. Nevertheless, maintaining heart health is a personal responsibility and one is never too young, nor too old to take care of their heart.

Ethnicity as a Major Determinant of Cardiovascular Health

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I recall participating in a clinical study during my student days at the University of Sunderland, U.K. in 1983. The study was undertaken by one of my Pharmacology professors, Dr. Max Weetman. The hypothesis being tested was that a blood pressure lowering effect with verapamil, a well known L-type Ca²⁺-channel blocker, would be seen with lower doses in people of South Asian origin than that being used in the Caucasian population. The idea being that drug metabolism/clearance is slower in South Asians and thus lower doses may be needed for effective blood pressure lowering in this population group. While genetic differences in target proteins, metabolizing enzymes and transporters that contribute to the inter-individual differences in drug response is now well documented,¹⁻⁴ some 33 years later, I recently decided to re-acquaint on the topic of ethnicity and cardiovascular disease (CVD) and was pleasantly surprised with the wealth of information and data.

Given the role of our genetic make up, sex, environmental, nutritional and lifestyle factors on the risk of CVD, this short article is designed to provide a brief overview on race/ethnicity as well as cultural and language barriers as major determinants of increased risk of CVD. It is pointed out that while there is an overlap between race and ethnicity, they are distinct terms; race is associated with biology, whereas ethnicity is linked to culture and while genetic differences exist, diversity within different racial and ethnic groups means that genetic pattern common to some groups cannot be generalized to an entire race.⁵

It has been said that an individual's race or ethnicity should not have any correlation with a greater risk for having heart disease or stroke, but unfortunately it does.⁶ In addition, racial and ethnic minority populations experience more barriers to CVD diagnosis and care, receive lower quality of treatment and experience worse health outcomes than their white counterparts.⁷ There are a number of factors that are contributory to these facts and include income and education (socioeconomic) disparities, genetic and physiological factors, access to health care as well as language and cultural barriers.^{7,8}

Statistics from the British Heart Foundation (BHF) show that in the U.K.:

- South Asians (Indians, Bangladeshis, Pakistanis) are at increased risk of developing coronary heart disease (CHD).⁹
- South Asians over the age of 65 years are more likely to have high blood pressure.⁹
- People of African-Caribbean background are more likely to have high blood pressure.⁹
- The prevalence of type 2 diabetes for people of African-Caribbean and South Asian background is much higher than the rest of the population.⁹

American Heart Association (AHA) statistics have also revealed disparities in CVD in the USA population:

- CVD age-adjusted death rates are around 30% higher for blacks than for the overall population.⁶
- Blacks are nearly twice as likely to have a first stroke and much more likely to die from it than whites.¹⁰
- American Indians/Alaska Natives die from heart disease much earlier than expected i.e. 36% are < 65 years of age compared with only 17% for the overall population.¹¹
- High blood pressure is more prevalent in blacks.¹⁰
- Non-Hispanic blacks, Mexican-Americans, American Indians and Alaska Natives have a higher prevalence of diabetes than non-Hispanic whites for adults > 20 years of age.¹⁰
- Non-Hispanic blacks and Mexican-American women have a higher rate of obesity, a risk factor for CVD and diabetes, than non-Hispanic white women.¹⁰

Canadian data from the Heart and Stroke Foundation (HSF) have also shown that different Canadian ethnic groups are at higher risk for CVD. Among the findings, it was reported that:

- South Asians have a much higher rate of diabetes.¹²
- East Asians have higher rates of increased blood pressure.¹²
- Blacks have a higher prevalence of diabetes and high blood pressure.¹²
- South Asians, East Asians and Blacks have less awareness than Caucasians of CVD risk factors in

general including diabetes, obesity, sedentary lifestyle and stress.¹²

- Higher odds of CVD are associated with overweight and obesity for the Chinese, Filipino and South Asian groups.¹³
- Aboriginal people are 1.5 to 2 times more likely to develop heart disease than the general Canadian population and 10.5 times more likely to die from CHD.¹⁴
- First Nation people on reserves have a 3-5 fold higher rate of diabetes than that of other Canadians.¹⁴
- First Nations and Inuit people typically have heart attacks earlier in life than non-Aboriginal people.¹⁴
- Higher rates of congenital heart malformations have been identified in some Inuit and First Nations than in the non-Aboriginal population.¹⁴
- At least 3 different First Nations communities have disproportionately higher rates of congenital long QT syndrome, a genetic predisposition to arrhythmia and sudden cardiac death.¹⁴

Although the statistics show that different ethnic groups have varying predispositions for CVD, much of the risk is largely preventable. Major modifiable factors include tobacco smoking, high blood pressure, high blood cholesterol, insufficient physical activity (sedentary lifestyle), being overweight and obese, diabetes, poor nutrition and excessive intake of alcohol. However, other risk factors that are beyond our control include age, sex, family history, genetic make up and ethnicity. Preventive approaches clearly require a major health behavior change from adverse lifestyle habits among people of different ethnic groups that are identified as being at risk for developing CVD, which may well be a difficult challenge with some groups. However, improving awareness and communication are important aspects of such strategies, given that 1 in 3 of the Canadian population in 2031 will constitute visible minorities¹⁵ and that the proportion of people in the U.S.A. who are members of at least 2 different ethnic groups will increase by 10% in 2050.¹⁶

The AHA, BHF as well as the HSF have taken great strides in providing patients and the general public with culturally and linguistically specifically designed health care and educational material^{6,9,12} that also encompasses ethno-specific prevention and screening strategies. At the same time, increasing the awareness about cardiovascular health disparities among cardiovascular health professionals/practitioners is also an essential part of the prevention program. Further advancements on research involving investigations on the genetic and environmental factors that contribute to the disparities in CVD in different racial/ethnic groups also needs to be accelerated. The example that I read and can be given here is that

people who lived in equatorial Africa developed a genetic predisposition to being salt-sensitive, which means more sodium retention.^{5,17} This would increase blood volume, which, in turn, would raise blood pressure. Salt sensitivity allows the body to conserve water, which is clearly beneficial in hot, dry climates, however; generations later, the American descendants of these individuals remain disproportionately salt-sensitive.^{5,17} On the other hand, I also read that recently immigrated people from East Asia tended to have lower rates of heart disease than other Americans, but their children, who adopt Western cultural practices, have higher rates of obesity and other CVD risk factors, highlighting the importance of lifestyle habits and heart health,⁵ which may also be associated with an inability to adapt to change due to the genetic make up.

While racial and ethnic heritage may influence heart disease risk, cardiovascular health can be improved with lifestyle changes, balanced nutrition and regular physical activity as well as through increased awareness, education and understanding of the factors that can elevate the risk of developing CVD; all of these modifiable aspects may play a greater role in promoting cardiovascular health and preventing the development of CVD and associated risk factors than our racial/ethnic background, but the manner and format in which the message for prevention of CVD is disseminated would be in accordance and need of the different racial/ethnic groups. One-size preventive strategies may not fit all, but a customized approach in line with ethnicity may be more appropriate.

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Cardiovascular Research Conducted and Published in India – Current Trends

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A vast majority of data in cardiovascular medicine emanates from the west, involving a mix of nationalities. The results of such studies are extrapolated for being applied in Indian subjects. The clinicians adopt the guidelines developed by international professional societies largely, with a few exceptions such as the guidelines for diseases like metabolic syndrome, rheumatic fever, to name a few; which have been developed with a regional perspective. Dedicated studies in Indian population have been largely confined to epidemiology. Large scale intervention studies and clinical trials conducted entirely in the subcontinent are scarce, and there is a concern in a section of medical practitioners and public in the country regarding the applicability of findings of studies conducted elsewhere in Indian population. In this context, there has been a recent increase in studies conducted entirely within the country. In this commentary, a few such studies which were reported in Indian Heart Journal (the journal of

Cardiological Society of India) recently are being discussed.

Bansal and colleagues¹ discuss about the normal reference echocardiographic values obtained from a pilot study of 100 healthy volunteers in North India. The study reports remarkably lower absolute dimensions for cardiac chambers in Indian adults when compared to the American Society of Echocardiography reference values. The differences were partly resolved by indexing them to body surface area. However, the functional characteristics such as ejection fraction seemed to be unaffected. Clinical decision-making in some of the diseases like regurgitant valvular heart diseases, dilated cardiomyopathies involve absolute measurements of chamber diameter and the lower normal values in Indian population should provoke development of region-specific guidelines for management of such diseases.

Residual atherogenic dyslipidemia in Indian patients after statin therapy is the focus of the prospective multicentric REMAINS study (Dyslipidemia Residual and Mixed Abnormalities IN spite of Statin therapy)². Patients, during hospitalization for their first acute coronary event were initiated on various doses of statins, usually high dose atorvastatin and were evaluated at the end of 12-week period for the changes in lipid profile. While the reduction attained in the levels of serum low density lipoproteins was satisfactory, there was residual mixed dyslipidemia in the form of further lowering of serum high density lipoprotein cholesterol and no change in the levels of serum triglycerides. Given the higher prevalence of mixed dyslipidemia in Indians when compared to western population, whether the treatment of the non-LDL cholesterol factors in populations exhibiting similar profile adds any benefit to conventional lipid management guidelines is not explored yet.

The epidemiology of coronary heart disease (CHD) in India has been a matter of concern, with the disease being attributed to manifest in a younger age in South Asians, than in the western population. In this context, the cross-sectional survey conducted in Vellore, Tamil Nadu between 2010-2012 provides an opportunity to compare with the previous survey in the same region held a couple of decades ago and thereby report the trends in CHD³. The community survey based on WHO STEPS method, incorporating previous documentation of diagnosis, symptoms (Rose angina questionnaire) and electrocardiogram was performed in adults aged 30-64 years. The authors report a shift in age of onset of CHD towards younger age groups. While the prevalence rates remained the same in males during the period, there was a remarkable increase in the prevalence rates among women in both urban and rural communities. While the rates of tobacco use decreased in men, the other risk factors rose in both men and women. The prevalence of CHD in women was higher than in men in both urban and rural settings which was driven by higher prevalence of symptoms and ECG changes among women. This trend of rising CHD among women alone, based on symptoms and ECG has been noted in other surveys in the country too, calling in for validation of Rose angina questionnaire in females.

Edible oils used for cooking in India often rakes up debates among public and professionals alike. Previous studies conducted in west have concluded the beneficial effect of decreasing intake of oils rich in saturated fatty acids on cardiovascular outcomes. However Indian cooking is distinctive and often involves deep frying, resulting in high oil temperatures. The effects of using coconut oil (rich in medium-chain saturated fatty acid) as

cooking oil on lipid profile, antioxidant mechanism and endothelial function was compared with those of sunflower oil (rich in polyunsaturated fatty acid) over a period of two years in patients with stable CHD.⁴ The single-center study did not reveal any differences between the two groups in these parameters. Notwithstanding the limitations in sample size, follow up duration and the influence of secondary prophylaxis on outcomes, this is one of the few studies held in India which has analyzed the impact of dietary oils on cardiovascular disease.

Poor adherence to medications after hospitalization is one of the impediments in improving efficacy outcomes in India. Surveillance systems are in place for certain diseases like Tuberculosis, while the same cannot be claimed in the case of chronic life-style diseases. In the PURE study, about 80 percent of patients in South Asian countries had discontinued secondary prophylaxis at 4.5 years. The authors explore utilization of non-physician healthcare workers for improving medication adherence and implementing life-style changes in patients in the vicinity of a tertiary care-center and report 90 percent adherence rate at the end of one year, along with positive effects on risk factors.⁵

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Dear Colleagues,

On behalf of the Organising Committee, it is my great pleasure to officially invite you to join the **4th European Section Meeting of the International Academy of Cardiovascular Sciences (IACS-ES)** in **Pécs, Hungary**. The Symposium is scheduled to **September 28-30, 2017**, the year of the **650th anniversary of Pecs University's foundation**.

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Ferenc Gallyas Jr.

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