The 2nd Symposium on the Future of Heart Health was a major success in Winnipeg on Sept. 20, 2008. The Academy applauds our co-sponsor the Cardiac Sciences Program, co-chairs Dr. Alan Menkis and Dr. Andrew Morris, our amazing speakers and all our supporters.

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We developed a concept to share the wisdom around the world. Inspired by the unique TED.com, we now have the talks available ONLINE - http://www.heartconference.com

(L-R) Paul Albrechtson; Hon. Kerri Irvin-Ross, Manitoba’s Minister of Healthy Living; Andrew Morris; Benedict Maniscalco, CEO of Heartbeat International; and Alan Menkis.
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Cardiovascular Disease is Canada’s Number One Public Health Problem: Why We Need a Canadian Heart Health Strategy

A Progress Report by
Eldon R. Smith OC MD FRCPC
Presented at:
The 2nd Symposium on the Future of Heart Health
Saturday September 20, 2008
Samuel Cohen Auditorium, St. Boniface Research Centre
Winnipeg, Manitoba

Introduction
It is a great pleasure to be here and I would like to thank Dr. Menkis and the other organizers for the opportunity to talk about the Heart Health Strategy. I would like to begin by talking about cardiovascular disease and why it is our number one public health problem. I will then follow-up by discussing the Heart Health Strategy and tell you where we are at the present time.

Cardiovascular Disease in Canada
Globally, there are over 17 million deaths from cardiovascular disease; more than twice as many as from cancer and four times as many as from respiratory disease (Figure 1).

What about in Canada? Over the last 50 years we have had a progressive decline in the age-adjusted mortality rate from cardiovascular diseases for both men and women (Figure 2), however, this decline may be leveling-off. Nevertheless, there has been a very dramatic improvement in survival from cardiovascular disease. The cause of improvement is not totally clear, but it is generally assumed to be partially due to preventative strategies and partially due to advances in therapies. There is, however, some bad news: Cardiovascular disease increases with age. As one approaches the age of 70, about 25% of individuals have heart disease (Figure 3). When you add in the other cardiovascular diseases, about 35% of people over the age of 75 have cardiovascular disease.

In Canada, there is also an inequity in the distribution of cardiovascular disease across the provinces (Figure 4). If we look at British Columbia (BC), there is something in the air compared to Newfoundland - both coastal provinces, yet there is a huge increase in the age-standardized mortality rate from cardiovascular disease. This east to west gradient is not totally explained: Some of it is due to social economic factors; some of it is probably genetic. Whatever the cause, it is a very worrisome observation.

Figure 5 represents data for cardiovascular disease in Canada for the years 2004-2005. According to these data, cardiovascular disease accounted for 32% of the deaths of Canadians and 16% of the hospitalizations. Of Canadian adults over 18 years of age, 4.8% self-reported having heart disease, and 1.1% reported that they have had a stroke. In 2004, cardiovascular disease cost Canadians $23 billion. Why is the burden so great?
It is partially explained by the Risk Factor Prevalence (Figure 5), as well as socioeconomic- and population-based determinants. The data indicate that 20% of Canadians still smoke and that in the 30 years and under age group, about 25% of Canadians smoke. In addition, according to self-reported data:

- 48% of Canadians are physically inactive.
- 56% eat inadequate amounts of fruits and vegetables in their diets.
- 23% report that they have excessive stress in their lives and their work.
- 17% have hypertension.
- 34% are overweight and 17% are obese. When combined, more than 50% of Canadians are obese or overweight.
- 7% are diabetic.

Diabetes is increasing progressively, indicating that increased numbers of people who are overweight or obese have lipid abnormalities. Furthermore, because these data were obtained by self-reports, we can surmise that these numbers are probably higher.

### Healthcare Costs

Given these numbers, two questions arise, “Do we not spend enough?” and, “If we spent more would we have better outcomes?” Figure 6 indicates how we perform comparatively to other countries in terms of percentage of gross domestic product (GDP) we spend on healthcare. In 2004, Canada spent 9.9% of the GDP on healthcare placing us in the middle of the pack. It does not look like we are under-spending in this particular area. However, a major problem in our system is the concern about sustainability. In 1990-91, provincial governments spent 24% of their program budget on health services (Figure 7). This rose to 33% in 2000 and is predicted to reach 50%, on average, across Canada by 2009. Figure 8 provides examples of this, taken from the Premier’s Advisory Council on Health in Alberta in 2001 while I was a member of the council. The total dollar expenditure for program spending by the provincial government was in the order of 17.5 billion dollars (top line). About 6 billion dollars was spent on health (bottom line). The middle line represents spending for other programs. If we continue to increase spending according to the inflation rate, and healthcare spending continues to increase as it has over the previous 10 years, by 2007-08 we reach a point where the spending on other programs begins to decline because healthcare spending has increased disproportionately to the spending for all programs combined. This has not yet occurred, in spite of continued increase in healthcare spending, only because Alberta has been blessed with abundant energy resources. The acceleration rate of the cost of healthcare has, however, continued to increase in the order of 10% per year and clearly will not be sustainable given what is happening in the overall economy.

A more recent example can be seen in British Columbia (Figure 9). In 2004-05, about 41% of program spending was on healthcare, 27% was on education, and 28% was on other programs, including all infrastructures and social services; things that are so important to us as citizens. At that time, it was predicted that if revenue grew by about 3%, which would approximate inflation, education spending should be increased by 3% to match inflation. If healthcare costs continue to grow at the customary 8% in British Columbia, by 2010-2011 there will be a sharp decrease in the amount of spending available for services other than health and education. If nothing was done and those predictions all came true, by 2017 or 2018, there would be no government funding available for anything other than health and education. Clearly, this is not a sustainable situation. We have got to find ways to decrease the cost of healthcare as a proportion of the total provincial expenditures.

If we look internationally, how are we doing (Figure 10)? We actually spend more on healthcare than any other country that has universal access, yet, our outcomes over the past decade have not been as good as many other countries (4). This is showing up in the fact that our life expectancy is beginning to decrease: For the first time, children of today are predicted to have a shorter life expectancy than their parents. This is the very first generation of Canadians where this is the case, and one of the major contributors for this is the threat of cardiovascular disease. Because of the increase in obesity, diabetes, hypertension, lipid
abnormalities and metabolic syndrome, we are expecting a marked increase in cardiovascular disease unless we do something about this; it is this situation that is the context for the Canadian Heart Health Strategy.

**Context for a Canadian Heart Health Strategy**

I repeat that cardiovascular disease is Canada's number one public health problem (Figure 11). The worrisome part of this is that some of the risk factors, unhealthy eating, inactivity, as well as obesity, diabetes, and hypertension, are actually increasing. The gap between what we know and what we do is significant, not only in primary and secondary prevention, but also in treatment. The healthcare system that we have developed over the century has not adapted well to the current situation. It lacks integration, access is limited, and there is significant disparity in access. Health-Human Resources in Canada are deficient. There are currently 5 million Canadians who do not have access to a family physician. Our care delivery models have remained stagnant for many years and we lack appropriate information systems to know how to target our activities and how to improve those delivery systems.

**The Canadian Heart Health Strategy**

Cardiovascular disease, however, does have one great advantage over the other chronic diseases: We know what we need to do. We have an enormous opportunity for prevention and we must use these opportunities. It was in 2006 that the Federal Minister of Health announced that the Federal Government would support the development of a Pan-Canadian Heart Health Strategy (Figure 12). A great deal of the credit for this initiative must go to Steven Fletcher, MP from Winnipeg, who actually spearheaded this initiative. He has been very supportive and was the individual who introduced a private members bill in Ottawa while he was in the Opposition. In this bill he stated that a country like Canada needed to have a national strategy for the major chronic diseases, including mental health, cancer, and heart disease. A National Cancer Strategy has been developed and Government has funded an implementation plan. A Mental Health Commission has been created which will develop a strategy over the next few years.

Figure 13 describes the Canadian Heart Health Strategy (CHHS). The purpose of having a strategy is to reduce the growing burden and loss due to cardiovascular disease.

We wanted to make the process independent and stakeholder-driven. By doing so, we would have much greater opportunities to have buy-in from the stakeholder community and probably from citizens at-large.

We wanted the Strategy to be comprehensive and to be integrated. We did not want to create new and different systems specifically for cardiovascular disease, but it needs to be integrated with the care of other chronic diseases. It needs to address the continuum of the health system - from health policy to prevention, care, rehabilitation, and end-of-life planning and care. It also needs to address the continuum of life from pre-conception, where some of the origins of cardiovascular disease begins, through to the end of life. It needs to address the disparities in access to services and to deal with the needs of Canadians. The recommendations, of course, need to be evidence-based and/or at least based on best practices.

The Heart and Stroke Foundation of Canada (HSFC), the Canadian Cardiovascular Society (CCS), and the Institute for Circulatory and Pulmonary Health (ICPH) of the Canadian Institutes of Health Research (CIHR) provided leadership from the beginning, and continue to provide valuable guidance (Figure 14).

We appointed a 29-member steering committee that is amazing in its diversity, expertise and experience. The committee has formed 6 working groups and each of the working groups has an average of 12 members. Therefore, for the past 2 years we have had about 100 volunteers working on this project. We have consulted more than 1400 stakeholders, including industry, national organizations involved in healthcare, cardiovascular care and prevention, and citizens of Canada. We have also consulted extensively with Provincial/Territorial Governments. It has been very helpful to have all of this input.
The funding for the Strategy flowed through the Public Health Agency of Canada and they have been very supportive throughout the process. We have also received great assistance by a number of groups, including (Figure 14):

- Statistics Canada,
- The Canadian Institute for Health Information,
- Canadian Health Infoway Program,
- The Departments of Health in the provinces and territories and the
- Deputy Ministers of Health and Wellness in each of the provinces and Territories.

From the beginning we also worked with and engaged national organizations for Aboriginal and Indigenous Peoples, and their communities.

Priority Theme Areas

The working groups mentioned earlier were designed around six theme areas (Figure 15):

1. Information
We have been trying to run this very complex health system in Canada with very poor and inadequate information. We have not spent on information technology the way that we need. This will be a key factor in being able to have an improved and more efficient, cost effective system in the future.

2. Policy development
Policy development is required to create environments conducive to cardiovascular health.

3. Preventing, detecting, and managing major risk factors
We often talk about detecting and management, but it is important that we push upstream on this issue and start talking about preventing the risk factors for cardiovascular disease. At least, we must detect them early and manage them aggressively.

4. Addressing and enhancing Aboriginal/Indigenous cardiovascular health
This was considered to be such an important issue that it was made a separate theme for the working groups. Furthermore, we had at least one person with special knowledge and expertise concerning the Aboriginal and Indigenous People’s cardiovascular health issues working on each of the other working groups.

5. Timely access to quality (acute) care and diagnostics
The intention of this group was not simply to increase access to emergency rooms; rather, its goal was to improve everyday access to health professionals and their services.

6. Timely access to quality chronic disease management, rehabilitation services and end of life planning and care
In general the medical community has not done a very good job with end of life planning for people succumbing to cardiovascular disease. As cardiovascular care specialists we do not readily admit that death occurs. End of life is not easily predictable with cardiovascular disease, but what we have tended to do is ignore it rather than engage those patients who have a poor prognosis. This is, however, coming to the fore because of the major increase in the number of people with chronic heart failure.

Mandate of the Canadian Heart Health Strategy

The mandate that we accepted for the Heart Health Strategy was to develop a strategy document with a series of recommendations that would have an implementation plan: a “how-to” of sorts (Figure 16). It would also have a business case with a budget that would be directed towards the Federal Government. Because healthcare is delivered at the provincial level, it was not our mandate to get involved with routine delivery of health care. Most of the recommendations around patient care have been, or will be, on systemic changes.

The plan, when we started back in 2006, was that we would release the Heart Health Strategy in October or November of 2008. I kept telling everyone on the steering committee that it was very important to keep timeline because at my age, I didn’t want to get involved in a long-term project. However, because of the current political situation - the Federal Election
taking place in October 2008 - we have decided not to release the Strategy at the current time. We want to have a federal government look at it and determine where it is on their priority list; determine whether or not they are going to provide funding for it, and be part of the announcement. We have worked very hard on the recommendations contained in the Strategy; it would be ill advised for us to release the Strategy into a political void and then at a later date, try to convince the government to fund and implement the Strategy. In light of this, I will not present our recommendations to you in any final form. I will, however, discuss those that are likely to be part of the Strategy.

**Framework for the Recommendations**

We wanted the recommendations to be innovative, but at the same time, they must be practical and able to be implemented (Figure 17).

We understand the importance of involving partnerships in the implementation of the recommendations as well as the importance of providing incentives. Indeed, many people in the healthcare system are faced daily with disincentives to do the right thing. We need to get rid of these disincentives if we want to improve the system. We need to put policy and regulations in place that make the right choices, the easy choices for our citizens. The recommendations also have to be respectful of those jurisdictional issues between the Provinces, the Territories, and the Federal Government.

Clearly, there needs to be an emphasis on prevention because therein lies the opportunity for us to make a real difference. We need to move prevention upstream so we benefit by preventing risk factors as well as creating a healthier environment for the population with more favourable population-based health determinants. We also need to recognize and continue to recognize that prevention should be emphasized across the continuum of the system – from primary prevention through to end-of-life planning. There are also very cost-effective preventative strategies to prevent complications once disease has developed. To this end, we will be recommending that there be utilized a combination of legislation, regulation, incentives, education and social marketing. We also believe that care for cardiovascular disease needs to be focused in community-based primary care services, that utilize the chronic disease management model. This is actually something that most provinces in Canada are attempting to develop in one form or another.

**Recommendations**

There will be only six recommendations.

1. **Create Heart Healthy Environments**

   This recommendation is the policy issue (Figure 18). In order to take full advantage of the prevention opportunities for cardiovascular disease we must address the socioeconomic determinants of health, such as poverty, education, and housing issues; issues that are all very important. Fortunately, there are a number of initiatives underway across Canada, nationally and provincially that are already addressing those very issues. Although we are pointing out that these issues need to be addressed to capture the full benefit of the prevention opportunity, we are not going to make specific action items around them. We are, however, going to make recommendations in respect to:

   - Improving food quality and access, particularly the issue of processed trans fats and the amount of salt in prepared foods.
   - Advertising of food products to children.
   - The need for better labeling about caloric content of portions.
   - Increased opportunities for physical activity in communities, in the workplace, and in schools.
   - Re-invigorating the issue of reducing tobacco use, including preventing some of the advertising that is currently being directed at children, i.e., bubblegum flavored cigarillos.
2. Help Canadians lead healthier lives

This recommendation is about empowering our citizens (Figure 19). There is a tremendous opportunity for self-care. To do so, citizens need information support systems to provide consistent messaging about cardiovascular risk factors. One of the items that we will be recommending is funding to develop common messaging, not only about the cardiovascular risk factors, but also about those risk factors that are common to other chronic diseases. We need a reliable, dependable, user-friendly source of information for Canadians.

We are also recognizing that due to the shortage of healthcare workers we need to look at alternative means for delivering healthcare, particularly in respect to screening, follow-up and some educational programs. These might be well offered in community settings with help from volunteers.

3. End the Cardiovascular Health Crises Among Aboriginal/Indigenous Peoples

One of the specific recommendations from that theme working group is that we need to get a more focused stakeholder group together to develop an action plan for cardiovascular health needs of the Aboriginal/Indigenous peoples (Figure 20). It must involve their communities, their national organizations, the regional health authorities and provincial/Territorial governments, and it must be a multi-year action plan developed around the recommendations that we are making.

In order to help implement this we will be recommending that there be a National Aboriginal Center - or a network of centers - for chronic disease prevention and management with adequate input and direction and involvement from the Aboriginal communities.

2. Help Canadians lead healthier lives

- Work with other CD Strategies to develop common messages about risk factors
- Develop a Canadian source for information
- Provide screening, education and follow-up in community settings

3. End the CV health crises among Aboriginal/Indigenous peoples

- Develop a multi-year action plan to meet the CV health needs of Aboriginal/Indigenous peoples and communities
- Create a National Aboriginal centre(s) for chronic disease prevention and management

4. Continue to Reform Health Services

- The CDPM model for most CV prevention, screening and care
- Regional integrated networks of specialized CV care
- More end-of-life planning and care
- Maintain CPGs current with new KT tools
- Develop comprehensive set of Quality Indicators

5. Build the Knowledge Infrastructure to Enhance Prevention and Care

- Enhance CV surveillance
- Accelerate the development of eHR and eMR
- Develop information systems for CDPM
- Support research
  - Centre(s) of excellence in Vascular Health
  - Genetic markers of disease and prognosis
  - Cohort study

- Development of specific research initiatives such as a cohort study in partnership with the National Cancer plan.

6. Developing the right people with the right skills. Overall, we need to strengthen our cardiovascular prevention and care workforce (Figure 23). To meet this challenge, we will need:

- More education and health promotion in disease prevention within all of the healthcare professions. (Figure 23)
In closing, there are many challenges lying ahead for the implementation of the Canadian Heart Health Strategy (Figure 24). We will need to build relationships with the new government and the new Minister of Health. Hopefully we will be able to release the Strategy very early in the New Year.

I am also worried about the general economic conditions affecting not only North America, but also the world. It’s going to make it more difficult to implement new programs if there is even more competition for funding. I hope that you will soon see the full Strategy document, and that we will have implementation funding made available by the federal government.

Thank you very much for this opportunity to discuss our new Heart Health Strategy with you.

The lecture honoured the memory of Harold Buchwald C.M., Q.C., LL.M., LL.D about whom Steven Fletcher, Member of Parliament for Charleswood–St. James–Assiniboia and Parliamentary Secretary to the Minister of Health, made the following statement in the House of Commons on April 18, 2008:

“Mr. Speaker, yesterday Canada lost a great Canadian, Harold Buchwald.

“After completing his Masters of Law at the University of Manitoba, he went on to establish one of the pre-eminent law firms in the country with his namesake. He became known in Manitoba as the “go-to-guy” for community organizations and often was their saviour.

“Mr. Buchwald was chair of the Winnipeg symphony orchestra and became its director emeritus. He was director of countless community organizations, including the Winnipeg Jewish Foundation. He received an honorary doctorate degree from his beloved University of Manitoba and honoured by the Hebrew University.

“Most recently Mr. Buchwald was involved with the Canadian Human Rights Museum and the save upper Fort Gary Gate initiatives. Mr. Buchwald was inducted into the Order of Canada in 1993.

“He is survived by his wife Darlene and sons Jeffrey and Richard, daughter-in-law Tracy and grandchildren Rachael, Serena and Adam.

“Whenever a musical note is heard in Manitoba or a piece of art is appreciated, a part of Harold’s soul is present.”

In appreciation of the decision by the Trustees of the Myles Robinson Memorial Heart Trust, of which Dr. Buchwald was a Founder and Past President, to support the IACS, Dr. Smith’s lecture was the first of an annual series.
The 7th Annual Meeting of the International Academy of Cardiovascular Sciences (the 31st Japanese Working Group of Cardiac structure and Metabolism) was held on July 12-13, 2008 at the auditorium of The Jikei University School of Medicine, Tokyo, Japan. Professor Satoshi Kurihara, M.D., Ph.D., Department of Cell Physiology, The Jikei University School of Medicine chaired the meeting.

The meeting was very successful and the participants (about 150) from all over Japan discussed about the recent advances of cardiovascular medicine. We had 20 presentations for Young Investigator Award and 18 regular presentations.

Dr. R. J. Solaro (Department of Physiology and Biophysics, Center for Cardiovascular Research, University of Illinois at Chicago, College of Medicine, Chicago) was invited to the meeting as an invited lecturer and talked about the signaling mechanism to modulate cardiac contraction at sarcomere protein level.

The following two speakers were invited to the meeting as special lecturer. Dr. Toshihiro Tanaka (Laboratory for Cardiovascular Diseases, Research Group for Disease Mechanism, Center for Genomic Medicine, RIKEN, Kanagawa, Japan) gave a lecture about genetic background of myocardial infarction and he reported one gene which is related to myocardial infarction. Dr. Michihiro Yoshimura (Division of Cardiology, Department of The Jikei University School of Medicine, Tokyo, Japan) presented the importance of natriuretic peptides in heart failure and also showed that the heart produces various humoral factors modifying cardiac functions.

The Young Investigator Award was presented to the following three presenters: Dr. Satoshi Nishimura (Department of Cardiovascular Medicine, The Tokyo University Graduate School of Medicine), Dr. Toshihiro Takeda (Department of Cardiovascular Medicine, Osaka University Graduate School of Medicine, Osaka, Japan), Dr. Hideyuki Kinoshita (Department of Medicine and Clinical Science, Kyoto University Graduate School of Medicine). All presentations for YIA were excellent and scientific level was high.

The next meeting will be organized by Dr. Haruaki Nakaya, Department of Pharmacology, Graduate School of Medicine, Chiba University. The detail will be announced soon. by Satoshi Kurihara
At the 7th Annual Meeting of Japan Section of IACS in Tokyo, July 12-13, 2008, the scientific committee (Chairman: Prof. em. T. Toyo-oka) elected three Doctors, Dr. Satoshi Nishimura (The Tokyo University), Dr. Hideyuki Kinoshita (Kyoto University Graduate School of Medicine) and Dr. Toshihiro Takeda (Osaka University Graduate School of Medicine) for the Young Investigator Award (YIA) IACS Japan Section. Siemens-Asahi Med. Techno LTD in Japan sponsors this YIA. At this meeting, 20 candidates from different University departments were recommended.

The first prize YIA, as excellent young researcher, received Dr. Satoshi Nishimura. He is researching in the Department of Cardiology, Tokyo University Graduate School of Medicine. After graduating from Tokyo University Graduate School of Medicine (MD) in 2000, he received his PhD from the same University in 2007.

The presentation, for which he earned the YIA, was “In vivo molecular imaging revealed chronic inflammation and vascular malfunction in obese adipose tissue in metabolic syndrome”.

Metabolic syndrome is a major cause of cardiovascular disease. Obese visceral adipose tissue remodeling and malfunction based on chronic inflammation plays a central role.

Dr. Nishimura found close spatial and temporal interrelationships between angiogenesis and adipogenesis, and both were augmented in obese adipose. VEGF-antibody inhibited not only angiogenesis but also the formation of adipogenesis in obesity. He reported also about the role of leukocyte-platelet-endothelial cell on the microcirculation of obese visceral adipose. (Diabetes 2007, JCI 2008).
The first Mendel symposium Genes and the Heart was organized in Brno (Czech Republic) in August 2003 at the site of Mendel’s discoveries. It is necessary to stress that the father of this idea was Prof. Dr. Makoto Nagano from Tokyo. The participants had a unique opportunity to present and discuss the results of contemporary genetics in the genuine atmosphere of its true founder. The scientific and social success of this meeting exceeded our expectations; we were repeatedly asked to continue and try to establish a new tradition. This request was strongly supported by our Japanese colleagues, both scientifically and financially.

We decided to invite the participants of the second Mendel symposium to another pleasant place of our country, the beautiful baroque castle Liblice, 45 km from the center of Prague. It was built between 1699 and 1702 as an aristocratic residence; now it is the property of the Academy of Sciences of the Czech Republic. The recent restoration has transformed the castle into a contemporary conference centre equipped with the latest technology. The castle is surrounded by beautiful French gardens with a ceremonial courtyard and offers an exceptional stimulating environment for scientific meetings.

The interest of the scientific community exceeded our possibilities since the capacity of the venue is limited. Nevertheless, the total number of participants was 101 they represented 17 countries from all over the world. The opening addresses were presented among others by the President of the Academy of Sciences of the Czech Republic prof Paces, Rector of the Charles University in Prague Prof. Hampl and President of the International Academy of Cardiovascular Sciences Prof. Dhalla. A total of 61 lectures were divided in 9 symposia: Angiogenesis, Remodeling, Atherosclerosis, Cardiomyopathies, Hypertension, Conduction system and arrhythmias, Ischemia and protection, Mitochondria and Therapeutic approaches. The integral part of the meeting was the ceremonial presentation of the highest honour of the Academy, the Medals of Merit to Prof. Jutta Schaper, Prof. Wolfgang Schaper and Prof Salvado Moncada (details of their careers were published in CV Network ONLINE 6/4 and 7/1), and the Distinguished Service Awards to Prof. F. Kolar and to Mr. B. Kalina. The social programme included a chamber concert of masterpieces of the Czech composer A. Dvořák and the farewell dinner at the Melnik Castle, accompanied by the showcase of modern and folk dances.

Evaluation of the whole meeting cannot be done by the organizers. Nevertheless, from the numerous greetings we have received after the Mendel symposium, it follows that the participants enjoyed both the scientific and the social programme of this friendly event. To enjoy photos from the Symposium, please visit: http://www.mendel08.cz/photogallery.php

Opening comments by Pavel Braveny at the 2nd Mendel Symposium Genes and the Heart, Liblice, Czech Republic, September 24 - 27, 2008

I believe there is no need to repeat the notoriously known facts about Johan Gregor Mendel. There is hardly any textbook of biology or encyclopaedia in the world which would omit this name. However, the facts are wrapped by romantic myths about an eccentric monk who happened to make a discovery due to his queer hobby and good fortune. I am going to point out briefly that there is nothing irrational in Mendel’s career and research.

Johan Mendel was born in 1822 in a small farmer’s family in Hynčice in Silesia. The only way to offer a proper education to an obviously talented but poor boy were ecclesiastical schools. Once on such a track, Johan gradually became attracted by science, namely mathematics and physics. In 1843, Mendel suddenly appeared far from his home, in Brno as friar Gregor of the Augustinian St. Thomas abbey. This location was quite natural. The Augustinian order was known to intentionally support science. Moreover, at that time, St. Thomas was headed by an enlightened abbot Napp, himself an amateur scientist in then very popular field of agrology and breeding. Napp observed Mendel’s scientific aspirations with sympathy and allowed him to use the rich library of the abbey without restrictions and even to study his own favourite disciplines, mathematics and physics, at the University of Vienna (1851 – 1853). It was a most fortunate decision since his later discovery was based
on mathematical analysis, a completely novel approach in biology. Mendel was also kindly offered a piece of land and a greenhouse in the abbey’s garden for his experiments.

The intellectual milieu of the abbey was quite exceptional. It became a meeting point of theologians, philosophers, scientists, musicians. It is well documented that the foremost Czech physiologist J. E. Purkyně, a name certainly familiar to the cardiologists, used to be among the guests. For the sake of interest, during Mendel’s most intense research a ten years old boy arrived as a choirboy in the affiliated basilica, who became a pre-eminent, world famous composer half a century later, Leos Janáček. Similarly, the academic environment of the rapidly developing city played a role in Mendel’s career. He presented a lecture on his results in 1864 at a meeting of a well established society which existed in Brno, “Gesellschaft für Beförderung des Ackebaues, der Natur und Landeskunde” and published them in the journal of the society under the title “Versuche über die Pflanzen-Hybride” one year later.

It is true that the attempts to verify the rules of heredity on other plant species were a bit disappointing. It may seem that Mendel’s original choice of pea was a mere lucky chance. But, more likely, owing to his exceptional observational talent he recognized the distinct features of the pea varieties ready to serve as a model. Obviously this was in the beginning of his idea to analyse these features in successive generations quantitatively, using statistics. This idea may be considered a prelude to currently so popular mathematical modelling in biology.

Johan Gregor Mendel was a remarkably many-sided scholar. Besides his ecclesiastical duties and research activities, Mendel taught physics at the German high school for a couple of years, systematically observed and recorded meteorological data, he was a well-informed beekeeper (his beehive still exists) and even sat on the supervisory board of a prominent local bank. When abbot Napp died in 1867, Mendel as the most revered candidate became his successor. No wonder that the greenhouse was deserted and the experiments discontinued.

Mendel’s discovery was initially almost completely misunderstood and forgotten, like all premature discoveries use to be. He was aware of its significance and, at the same time, controversial character. He wrote to his friend – and a fierce opponent at the same time - Nägeli in 1867: “I have suspected that it is most difficult to reconcile my results with the current knowledge. With regard to the circumstances which followed the publication of such an unfamiliar experiment, they represent a dual peril: one for the experimenter and another one because of the consequences.” He was right. The Mendelian rules of heredity were doomed to unbelievable events to come. They were ignored for the next 35 years to be rediscovered independently by de Vries, Correns and Tschermak in 1900. They became fully appreciated only gradually and with difficulty. In his homeland and eastward, they were doomed by the communist ideology for nearly two decades.

Johan Gregor Mendel died in 1884 at the age of 62 years. He did not live to see even a hint of recognition of his discovery. Today, he is appreciated as one of the most influential scientists of the 19th century, as the very founder of genetics.

Bob Kalina honoured with Academy Distinguished Service Award at Mendel Symposium in Czech Republic

Robert Kalina was born in the city of Brno in what was then Czechoslovakia. He came to Canada as a refugee in 1968, when he was a 21-year old university student. He arrived in Regina, Saskatchewan with ten dollars in his pocket and the knowledge of only five English words.

Robert worked as an office cleaner, window washer, payroll clerk and steel worker during summers while attending university where he studied Arts and Sciences.

Following his graduation from University of Saskatchewan, Robert obtained a marketing position in the pharmaceutical industry first in Saskatchewan and then in Toronto. It was at that point that he realized how difficult it was for Canadian medical researchers to publish their work in their home country of Canada.

In 1984 he started Pulsus Group and in January of 1985 launched the first issue of The Canadian Journal of Cardiology under the editorship of Dr. Robert Beamish and with enormous help from Dr. Naranjan Dhalla. The Canadian Journal of Gastroenterology was launched shortly after; with The Canadian Journal of Infectious Diseases following. Today Pulsus publishes 9 peer-review journals in a variety of therapeutic areas.

In 1995, 10 years after the launch of The Canadian Journal of Cardiology, Professor Dhalla suggested that it would be appropriate for Robert to give something back to his old country and introduced him to Professor Ostadal. Experimental and Clinical Cardiology was launched in the summer of 1996 and it continues to be published quarterly as the official journal of the IACS.

Bob is married with two children. His wife Diane is heading up the establishment of a biotech company in Vienna, Austria; his son Dale is a medical student in Brno, Czech Republic; and his daughter Jacqueline is studying commerce at Queen’s University in Canada. Bob will spend much of his time travelling.
Frantisek Kolar honoured with Academy Distinguished Service Award at Mendel Symposium in Czech Republic

Dr. Frantisek Kolar is a graduate of the Faculty of Science, Charles University in Prague, where he received his PhD degree (physiology) in 1985. Then he accepted a postdoctoral position in the field of experimental cardiology at the Institute of Physiology, Czechoslovak Academy of Sciences in Prague. His research training includes stays at several institutions in Canada, Belgium and Scotland. In 2006, he was appointed Full Professor of Medical Physiology at the Charles University in Prague. Since 2005, he has been the Head of the Department of Developmental Cardiology at the Institute of Physiology, Academy of Sciences of the Czech Republic.

Dr. Kolar is a member of several professional societies including the International Society for Heart Research (serving as a Secretary of the European Section in 1998 – 2003), European Society of Cardiology, International Society for Mountain Medicine, and Society for Experimental Biology and Medicine. He is currently on editorial boards of Experimental Biology and Medicine and Physiological Research, and serves as section editor of Acta Physiologica and associate editor of Experimental and Clinical Cardiology. In 2002 – 2003, he was the Chair of the Committee for Natural Sciences of the Czech Science Foundation. He received awards from the Czechoslovak Cardiological Society (1985) and the Ministry of Health of the Czech Republic (1995).

Dr. Kolar has published more than 120 peer-reviewed papers, reviews and book chapters and is a co-author of one monography. His main research interest has involved early postnatal development of the heart with particular respect to cardiac contractile function and its humoral control. More recently, he has focused on myocardial ischemia/reperfusion injury and investigations of the molecular mechanism of cardioprotective effects of chronic hypoxia.

Thanks to A. H. A. and Mars Inc!

In cooperation with Mars Inc. we were able to accept American Heart Association’s offer of complimentary space at their Annual Scientific Sessions in New Orleans in November 2008. We met with Prof. Yacoub and many Fellows. Mars provided samples of their heart-healthy CocoaVia bars www.cocoavia.com which helped us attract over 2,000 visitors, many of who have registered to receive our electronic information. The Academy official journal American Journal of Cardiovascular Drugs Editor Amitabh Prkash from New Zealand participated in the staffing and promotion of the Booth.

An important aspect is catching up with friends like Boja Ostadal and his son Petr, both cardiologists in Prague.
São Francisco de Assis Truth is Jesus Cardiovascular Foundation
Postgraduation 2008- PhD International Upgrading
Confered to Prof. Dr. Carlos Henrique Marques Santos – MS, Brazil
Research and Lecture: The Ischemic Preconditioning and Postconditioning Effect on the Intestinal Mucosa of Rats Undergoing Mesenteric Ischemia/Reperfusion Procedure

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During the annual International Academy of Cardiovascular Sciences meetings in Belo Horizonte, Brazil in November 2007, Dr. Naranjan Dhalla and Ivan Berkowitz met with a distinguished group at the Faculdade de Ciências Médicas de Minas Gerais (FCMMG), a most prestigious health academic institution in Belo Horizonte. Founded in 1950, its Medical School is the second oldest in the State of Minas Gerais and several generations of foremost health care professionals were graduates of that School.

Subsequent to their visit to confirm an important series of agreements with Dr. Bill Hiatt and the CPC, Colorado Prevention Center, University of Colorado at Denver, a group of FCMMG leaders came to Winnipeg:

Paulo E. Tupy da Fonseca, MD
Professor of Medicine (Internal Medicine and Cardiology)
FCMMG Vice-President for Academic Affairs

Leonardo T. C. Brescia, MD
Professor of Surgery (General Surgery)
General Director, University Hospital Sao Jose

David P. Brasil, MD
Professor of Medicine (Cardiology)
Director, Cardiovascular Investigation Center, University Hospital Sao Jose
International Liaison Officer, FCMMG School of Medicine

A series of meetings were arranged with Dr. Alan Menkis, Medical Director, Cardiac Sciences Program; Dr. Grant Pierce, Executive Director of Research, St. Boniface General Hospital Research Centre (SBRC) and Dr. Bram Ramjiawan; Dr. Naranjan Dhalla, Executive Director IACS; Dr. Randy Guzman, Director of the Asper Clinical Research Institute, St. Boniface General Hospital Research Centre SBRC and Dr. Pram Tappia, Clinical Research Associate; Dr. Pawan Singal, Director, Institute of Cardiovascular Sciences, SBRC; Dr. Peter Zahradka, Team Leader, Canadian Centre for Agri-Food Research in Health and Medicine; Dr. Lorrie Kirshenbaum, Director of Research Development, Faculty of Medicine, University of Manitoba; and a Working Lunch with the ICS PI’s on “Teaching and Research Initiatives in Brazil for International Collaborations”.

There was significant enthusiasm generated and numerous areas of follow-up will be pursued.

Needless to say, our visitors were shown the highlights and enjoyed their first taste of real winter!

The second international symposium “Advances in Cardiovascular Research” was held during Sept. 27-29, 2008, three years after the first meeting held in Smolenice Castle, the Congress centre of the Slovak Academy of Sciences. This time it was held in the Hotel Hradna Brana in Devin, under the slopes of the historical Devin Castle near Bratislava. The main organizers (Prof. Slezak, Dr. Styk and Dr. Ravingerova) from the Institute for Heart Research SAS and coorganizing institutions from the Slovak Society of Cardiology and Slovak League Heart to Heart, as well as from the International Academy of Cardiovascular Sciences (IACS) and European Academy of Sciences and Arts, focused on the intensive interaction between the basic science and clinical practice. Thus, the main topic of the meeting was recent advances in the research of cardiovascular diseases, from genes and molecules up to the clinical applications including modern trends in the treatment of cardiovascular diseases. The Devin Symposium also followed the second Mendel Symposium Genes and the Heart held in the Congress Centre of the Czech Academy of Sciences in Liblice, CR. During 1.5 days of a very intensive scientific program, 55 participants of the Devin meeting had the opportunity to attend 25 lectures of the renowned experts in the field from 5 European countries, USA and Canada and to to take part in the poster discussion.

These were the main scientific topics of the symposium:
1. Dislipidemia, diabetes, metabolic syndrom – in relationship to its impact on cardiovascular diseases and potential pharmacological approaches.
2. Novel understanding of the role of sympathetic nervous system and interaction of brain and heart functions in the mechanisms of hypertension.
3. The role of nitric oxide in the regulatory and cardioprotective mechanisms.
6. Molecular mechanisms of the cell death and survival in cardiovascular system.

Besides well-known renowned representatives of the scientific and clinical institutions in Canada (Prof. P. Singal, Prof. G. Pierce and Prof. N. Dhalla from Winnipeg, Prof. F. Leenen from Ottawa) and USA (Prof. N. Maulik and Prof. D. Das from Farmington, Prof. P. Kadowitz and Prof. D. McNamara from New Orleans, Prof. S.W. Schaffer from Mobile), contribution to the program was also made by the scientists from the V4 countries and Turkey. Poland was represented by Prof. A. Beresewicz from Warsaw, Hungary was represented by Prof. Z. Papp from Debrecen and the Czech Republic was represented by Assoc Prof. M. Novakova from Brno. Turkey was represented by Prof. B. Turan from the University in Ankara.

In each section of the meeting there was a major contribution of the scientists from the organizing institution, Institute for Heart Research, and also from the Institute of Normal and Experimental Pathological Physiology SAS: Dr. T. Ravingerova, Dr. N. Vrbjar, Ing. A. Ziegelhoffer, Dr. N. Tribulova, Prof. J. Slezak and Dr. O. Pechanova (UNPF SAV).

Slovak cardiological society was represented in the presentations of the renowned Slovak cardiologists: Prof. J. Murin, Prof. A. Dukat, Doc. E. Goncalvesova and Dr. M. Luknar.

In the poster section actively participated not only the scientists and PhD. students from the Institute for Heart Research and the Institute of Normal and Experimental Pathological Physiology SAS, but also the cardiologists from the National Institute of Cardiovascular Diseases in Bratislava. The meeting also highlighted some perspectives of potential collaboration including those within the European network programs, which were presented in the lecture of Dr. V. Both, the representative of the Office of SAS, in his talk about the last FP7 Call in the Health priority area and cardiovascular diseases.

The major contribution of the meeting was a possibility of the intensive discussions and active interaction between the scientists from different areas of research and clinical cardiologists, which was very beneficial for all participants. Besides a rich scientific program, the participants had a unique opportunity to learn and see the details of the Slovak history documented in the attractive environment of the Devin Castle. An unforgettable cultural experience for all participants was a reception dinner accompanied by the performance of the Slovak folklore ensemble Bezanka under the leadership of Viliam Korencik and their folk dances and music from the various regions of Slovakia.
My involvement with research began in 1952 when my instructor in physiology, Lajos Takács MD, invited me, the third year student, to the Physiological Institute of the Semmelweis Medical University. I was placed in professor Asztrid Kovács's department where I could take part in investigations of oxygen and glucose consumption as well as hexokinase activity of the brain tissue under traumatic shock1.

There are two episodes worth mentioning from this period of time: 1) Manometers and glass dishes of the Warburg instrument were most fragile. In my second year at the Institute after finishing the experiment and doing the washing-up I fell and unfortunately broke most of them. Asztrid Kovács called me. By then I was nearly sure that this was the end of my career at the Institute. „We had suffered a great loss you know“ he said, „but it is only the person who works that can make mistakes. Take the list of absolute indispensable dishes to the technitian immediately and hand in the list of the rest within two weeks. Go and read in the library as long as you can't work“. 2) The second episode followed in my fifth year of studies: Professor Kovács knew well that after graduation I would like to continue research-work beside internal medicine. So in my last two years at the Institute he took me to professor Pál Gomóri's kidney-experiments where he usually took part with professor Mihály Földi where he gave me odd jobs around. After graduation in 1956 I got to the 3rd Medical Department headed by Pál Gomóri, where I was placed to the hands of Antal Káldor, a new member as well. Our task was to investigate the mode of action of hypoglycemic sulphonylureas newly introduced on the market. I was lucky to meet Antal Káldor and find the perfect colleague and ever best friend in him. Our analytical studies oriented to sulphonylureas and their effects on liver glycogenolysis2-3 and bile secretion4 appeared first in the „Lancet“ as „letters to the Editor“, later from 1960 as publications in international journals on the nervous system6, liver glycogenolysis, bile secretion5 and on liver glycogenolysis4-5,5.

It was in 1967 that our clinical experiment regarding diabetes came out first5 in the same time with the publication of my PhD Thesis. After defending my thesis professor György Gábor invited me to the team of the 4th Medical Department of the Semmelweis Medical University and the National Institute of Cardiology which he became the leader of right at that time. He expected me to organize the research laboratory beside doing clinical and experimental scientific work. More than two decades had to pass before we could move from the quickly established research laboratory in the cellar of the Cardiac Surgery to an up-to-date building equipped with dogs- and rodents-houses, a so called „cold-room“ badly needed to biochemical analysis, operating theaters with appropriate instruments for our cardiovascular experiments and consulting rooms for human investigations. It was still at the time spent in the cellar of the cardiac surgery that we received the old out-of-use devices for extracorporeal circulation from the Cardiac Surgery. This was a great step forward to establish a proper fleet of instruments for use in circulation experiments. György Grósz – introduced by my friend Sándor Juhász-Nagy – substituted for him while his being away on his scholarship in the US – was of great help in inventing and preparing the necessary instruments. Arranging the conditions for cardiovascular experiments I continued till 1978 – with the assigned assistants-- my metabolic investigations regarding the sulphonylureas and adrenerg neuron blockers6-7, Antal Káldor, by then, turned his attention definitively to clinical pharmacology.

When the day came to make cardiovascular experiments we studied the development of myocardial edema and ischemia with György Gábor30-35. Paral-}

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**Figure 1. Effects of hypoglycaemic sulphonylureas (panel A) on myocardial contractile force and velocity, on arterial mean pressure, cardiac output, aortic flow and velocity and on heart rate in dogs as well as (panel B) on electrical activity of isolated rabbit heart preparations.**
gen induced hyperosmolarity is its easier but not quicker infiltration into the cells. Enhanced wall stiffness decreases cardiac output while hyperosmolality enhances coronary flow. Glucose induced hyperosmolality does not exert such effect in presence of insulin. However, without insulin a more than 20% rise in osmolality of the perfused blood can induce not only dehydration of the ventricular wall but an increase in left ventricular wall stiffness as well with a worsening of myocardial performance, which can be of significance in type-1 diabetics or at extracorporeal circulation during operation a type 2 diabetic.

Among the non-invasive methods available in our country at the beginning of the 1970-s for judging the state of the human myocardium the most convincing sign was the diastolic gallop, namely the simultaneous appearance of the 3rd and the 4th heart-sounds. From these the 4th one – called atrial sound – refers to the rise of the ventricular enddiastolic pressure. So it can be regarded as an early sign of ventricular malfunction caused by myocardial fibrosis in persons above 60-65 years and otherwise free from clinical signs of heart failure. Our investigations on old, type-2 diabetics proved that our observations are valid for humans as well.66

During our heart muscle experiments the myocardial edema brought about artificial also furthered the stiffness of the left ventricular wall and reduced the performance of the heart. Comparing our observations with our investigations in hyperosmolality and extracorporeal circulation we could point out first in the world that changes of myocardial water content in both directions increase ventricular wall stiffness and decrease the performance of the heart44 (Figure 2).

In the meantime it became quite clear all over the world that a correlation exists between the incidence of diabetes and the frequency of cardiovascular alterations. Based on this perception and on our results I wrote my doctoral dissertation of the Hungarian Academy of Sciences (D.sc) in 1978.

In 1980 Budapest hosted the XXVIII. International Congress of the International Union of Physiological Sciences. Professor Szekeres came up to me in one of the breaks proposing to form an Experimentalis Section within the Hungarian Society of Cardiology as from the latter one there was more support to be expected than from the Hungarian Society of Physiology. I was assigned the task because at that time I had full overview of the state of the cardiological experiments in Hungary. Namely, it was me who had to prepare and present scientific reports regarding the human and experimental investigations in the state towards the Scientific Committee for Health and the Ministry for Health as the head of the Research Department of the National Institute of Cardiology.

Through László Szekeres I had the pleasure to meet leaders of the International Society for Heart Research. Also I took part in organizing the 18th European Congress of the European Association for the Study of Diabetes in Budapest, which widened the circle of acquaintances and lead to organize field trips to my colleagues and collaborations abroad.52-71. By then being well equipped in our research laboratory we could invite researchers from the so-called Socialist Countries and provide them with materials essential to collaborations.52-77. Furthermore, we could start a lot of human clinical investigations – as the consequence of our growing scientific/domestic collaborations – to clarify the preclinical left ventricular diabetic abnormalities,78-94 the cardiac consequences of diabetic autonom neuropathy 85-89, of alterations in trace elements 90-91, of the diminished sensitivity of diabetic coronary arteries to vasodilation. Furthermore, the vasodilator prostacyclin provoked a less effective vasodilation in the coronary arterial bed and reduced the performance of the heart. Comparing our observations with our investigations in hyperosmolality and extracorporeal circulation we could point out first in the world that changes of myocardial water content in both directions increase ventricular wall stiffness and decrease the performance of the heart (Figure 2).

As mentioned earlier61-65, it could be observed investigating the effect of hyperosmolality on the myocardium that coronary arterial flow increased in every cases significantly regardless of the presence or absence of insulin. This observation called our attention to analyzing the eventual modifications of the sympathetic innervation of the arteries in diabetes. Well, again, we were the firsts to notice that a tendency to vasoconstriction could be demonstrated during sympathetic electric stimulation (Figure 3A) or intraarterial infusions of catecholamines (Figure 3B) in the diabetic coronary arterial bed and in other parts of the circulation. These phenomena are seen as the earliest dysfunction in diabetic vessels before macroscopic or microscopic lesions are detectable in the arterial wall. The vasoconstrictor tendency is especially pronounced in the coronary arterial bed and absent in the coeliac one. In the coronary arterial bed vasodilatory interventions – for example 1-min aspirin or 1-min clamping of the artery – inversely provoke vasoconstriction mainly in diabetic coronary and less in the diabetic femoral arterial beds. Because it is well known that adenosine is the most important vasodilator metabolite, the alterations of coronary arterial conductivity were also investigated during the administration of adenosine. The vasodilation evoked by increasing doses of intraarterial adenosine infusion is considerably smaller in the diabetic than in the healthy states, whereas sodium nitroprusside or papaverine evokes identical vasodilation both in the diabetic and non diabetic coronary and femoral arterial beds. Insulin treatment could prevent and normalize these diabetic reactions.56-104

Further investigations shed light on the link between altered adrenergic responses and changes in the vascular biosynthesis and effects of some prostaglandins. Investigating the prostaglandin synthesis of coronary arterial rings from alloxan-diabetic and healthy dogs in Düsseldorf, with the help of professor Peter Rösen, it could be disclosed that isolated diabetic arteries synthesises similar amounts of prostacyclin (Figure 4A) and formed more thromboxane-A2 (Figure 4B) compared with healthy vessels. Phentylephrine potentiated the prostacyclin synthesis in controls, while it proved to be ineffective in diabetic arteries (Figure 4C). Alpha-adrenergic blockade normalized thromboxane-A2 synthesis (Figure 4B) and increased prostacyclin production (Figure 4A) in diabetic coronaries. Hypoxia resulted in enhanced synthesis of prostacyclin in normal vessels and in a less prostacyclin production in diabetic ones. In the presence of phentolamine no difference could be detected between the two groups (Figure 4D). Even in substrate availability (14C-archichonic acid, in vitro) the arachidonic acid metabolic rate was less in diabetic coronaries than in healthy vessels. On the basis of these data we could conclude that the imbalance between the vasoconstrictor and vasodilator prostaglandin and the lack of stimulated prostaglandin formation mediated by alpha-adrenergic mechanisms could contribute to the diminished sensitivity of diabetic coronary arteries to vasodilation. Furthermore, the vasodilator prostacyclin provoked a less effective vasodilation in the diabetic state, but only in the coronary and not in the femoral or coeliac arterial bed (Figure 5A). Cyclooxygenase blockade enhanced the effect of prosta-
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**Contribution to Humanity Award**

The University of Ottawa Heart Institute Living Legend Award “Contributions to Humanity” in recognition of achievements and advancing cardiovascular sciences was presented by Prof. Dr. Tofy Mussivand to Prof. Dr. Otoni M. Gomes on the occasion of the Scientific Forum XVIII - International Congress of Cardiovascular Sciences, promoted by the São Francisco de Assis Truth is Jesus Cardiovascular Foundation, held in Belo Horizonte, Minas Gerais State in Brazil November 27-29 2008

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