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**The Development of the Centre for Activity and Ageing at  
the University of Western Ontario, 1969 to 2007.**

The Cardiac Rehabilitation Study  
Child Growth and Development Study  
Cardio-respiratory function and Ageing  
The Centre for Activity and Ageing  
Kinetic Modelling of Gas Transport System

By

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### Acknowledgement:

I wish to thank Donald Paterson and Peter Rechnitzer for reading and correcting this review of our research programmes in Kinesiology and Physiology at The University of Western Ontario. This is particularly appropriate for the report of the growth of the Centre for Activity and Ageing as both Peter and Don played key roles in its development.

**Cardiac Rehabilitation Study:** I arrived at Western in the spring of 1969 and was immediately involved in setting up a research laboratory to study human cardiovascular and respiratory function. Peter Rechnitzer a clinician in London had set up some working relationships at Western with Mike Yuhasz and others. He needed to find a place to run laboratory tests on post coronary patients that were involved in exercise rehabilitation. I welcomed this collaboration and my laboratory was to function as the centre for the cardiac rehabilitation study. The measurements that I developed were important in documenting the cardiovascular functional changes in the men we were exercise training. This part of the study was critical to obtaining research funding and was a necessary addition to Peter Rechnitzer's research programme in the rehabilitation of post-coronary patients. My grant, although small, allowed for the establishment of such a laboratory and was a significant help in Peter's research in those early years.

As is always the case, the major hurdle was major funding to support extensive research. The grant that I had was a minor contributor for the purchase of equipment. Peter, Mike Yuhasz and I collaborated to start a larger trial into exercise rehabilitation funded by Ontario Heart, however this initial endeavour was soon to be replaced by a much larger study funded by the Ministry of Health for Ontario.

In the early 1970's, the Ontario Ministry of Health granted funds to study the role of exercise as a factor in recurrence rates among post coronary patients. There were seven different research centres involved in this work until 1976. This grant that we secured along with scientists from seven other research centres in Ontario funded over 5 years of investigations. These funds changed the face of applied cardio-respiratory Physiology in Canada. Many University centres benefited, and a high level of scientific investigations was nurtured. Without this funding and the rigorous scientific training it generated, this type of research work would have been delayed many years.

Other parts of the world, especially the work in the United States, would have excluded Canada for many years. Good science needs both outstanding investigators with demanding goals, in a working milieu that is challenging, and adequately funded. The Cardiac rehabilitation study started at Western was critical to this growth in Ontario and Canada. The funding that it brought to these institutions at this time was exceptional. The long-term effects were to change the course of this type of research in Canada for several decades to come.

At Western, through Peter's efforts, we also secured the help of a physician who worked in my laboratory on a project linked to the mutual research interests of Peter and me. A new physician was to take this position each year. This pattern was to carry on until the mid 1990's. Don Smith was probably the most memorable trainee and worked in my laboratory from 1988 to 1991, completing some excellent work with respiratory controls.

This research work was not carried out in a vacuum. These funds also made possible the establishment of a doctoral programme in Kinesiology at Western in the 1980's. Although, I had graduate students in the Department of Physiology who were active in these studies, the students in Kinesiology were also very

important in this work and added to the output of the laboratory. The contribution of the graduate student was essential to the success of the research and to the funding. Each played a significant part and any research development would not have been possible without this type of contribution. The many outstanding graduate students working in my laboratory carried the research load. They responded to my directions with exceptional ability and took an active role in the writing and publishing of research papers.

Included in the very early years were: Gary Ness, Don Paterson and Larry Wolfe. Later, among others, were Joe Blimkie, Scott Thomas, Joan Himann, Charles Rice, Tom Overend, Marc Poulin, Claudette St.Croix, Rob Petrella, Deborah Lucy, Cathy Amara, and with Don Paterson's help, Andrea Vovk (see appendices for complete list). We managed to have our research papers accepted in significant journals such as The Journal of Applied Physiology, and Medicine and Science in Sport.

The early success in grant acquisition was to lead to later achievements. In my opinion too little is made of these early accomplishments that provided both training for future scientists, money to fund significant research, and the steps on which work to this day continues to build. The laboratory that I established in the early 1970's remains focused on the investigations in cardio-respiratory function with emphases today on the elderly. The questions it addresses are not very different from those we examined 30 years ago. Even the techniques have remained similar.

**Ontario Exercise Physiology Group:** As this work was progressing, I found the need to expose my graduate students to science-based meetings. A meeting of scientists where they might present their findings and expose their work to criticism was established. I started the Ontario Exercise Physiology Group Meeting. The first conference was held in the winter of 1976 in Collingwood. It was attended by many outstanding Ontario scientists as well as many graduate students. These meetings continue to this day. I was happy to attend this year in Barrie, where the meetings have been held recently. As the founder, I presented a history of the Ontario Exercise Physiology Group to the delegates.

After the early years, I was to be continually blessed with outstanding research students who carried on the early traditions. Don Paterson, who had initially done his doctoral work on the cardiac study, returned to join me in 1975 and took on the administration of the growth study of young boys. Unfortunately, this study plan was to falter in the 1980's when we were unable to access the early data due primarily to rapid changes in computer profiling of the era.

In the late 1970's, the Ontario Exercise Heart Study was closed and a final research paper written. John Howard from the Business School joined Peter and me to analyse and publish some of the results on the psychological aspects of the subjects. John was later to collaborate with Peter and me on the Retirement Research Study.

**Centre for Activity and Ageing:** In 1978, I remember wondering what focus my future research should take. Future research support would depend upon a clear purpose and if it continued to use human volunteers, a medical

collaboration was critical. Peter Rechnitzer was expressing some interest in minimising his time at the University and concentrating more on his practice of medicine.

I undertook to search the literature for information on cardiovascular function, exercise and the elderly. There was very little research information on this topic in the late 1970's. The field seemed to be wide open and a very good prospect for funding support. Over several months in 1978 and 1979 I developed a keen interest into exploring the age related changes. Using exercise as a perturbation, I felt that I could describe different responses of septuagenarian and older men and women that had been overlooked since young college age subjects were the exclusive focus of earlier studies. I expected that I could win support from the premier granting agency of the Natural Science and Engineering Research Council. My first grant on this basis from N.S.R.C. was in 1981.

If I was going to start a centre devoted to research on ageing and physical activity, I knew that I would have to persuade Peter to join me in this work. A medical colleague who would take the health responsibilities was an essential part of any human research programme. After several months in the late 1970's, Peter did show some interest. To foster more development, I set up a trip for us in 1980 to visit the University of Nottingham where a programme of elderly research under Peter Fentem and Joan Bassey was well advanced. I would do a sabbatical leave at Nottingham University in 1981-82 and wanted Peter to visit this unit so that his interest might develop. The visit in 1980 was to be a great stimulus for our future work into exercise and ageing. I believe that it settled Peter's hesitation and he agreed to the involvement in the field of exercise and ageing research. I can remember sitting with Peter in a hotel in London watching people walk down the street and we wondered how speed of walking might be a critical determinant of the ageing process.

I spent 1981 to 1982 on a sabbatical at the University of Nottingham where I worked with a group on the contractile properties of muscle. This was a major break with past work but was to be important in Charles Rice doing his doctoral work with me in the mid 1980's. I also spent 3 months in Harbor General Hospital, California with Brian Whipp where I learned his techniques to measure breath-by-breath oxygen uptake and model cellular metabolism. This work was to set the pattern of the laboratory to this day.

Retirement Research Study: In 1981, along with John Howard we received support to examine the effect of the first year of retirement on cardiovascular function. The thrust of this research remained linked to health and heart disease. I authored our main report on this work in the mid 1980's. One very interesting outcome of this study is the ongoing exercise group that meets several times per week to this day at the University.

I realised at the later part of the 1980's that we needed a formal centre for activity and ageing research. To start the Centre for Activity and Ageing, I wrote the application for centre status to the University Senate in 1988. It was granted 1989 and the Centre for Activity and Ageing came into being. The centre was linked to the academic units of Kinesiology and the Department of Physiology as I had directed in my application. During this time, Don Paterson became more interested in ageing and joined Peter and me to help in some of our studies.

In 1987 we started with John Koval's help from the department of Epidemiology and Biostatistics a survey of health and fitness of a random sample from London Ontario. We named this the "self-paced walking study" since the measurement of walking patterns was a central focus of the investigation. Reports from this study are being produced to this day. This information on the elderly is a major contribution to the science of ageing and cardio-respiratory function.

The Centre is Established and Moved to Mount St. Joseph. Shortly after the self-paced walking study data collection was finished, the centre came into being and we moved into our new home at Mount St. Joseph. Peter played the main role in 1989 in securing the space for the research group at the Mount. A decision had to be made to move all of our laboratory facilities to the Mount. This was a troubling decision but in the end, I agreed to move my two laboratories from Thames Hall and the Department of Physiology to the Mount. With Don Paterson's help, we transported all the equipment including treadmills and gas analyses equipment, in January of 1989.

Once we were located in our new facilities, I remember sitting in an office at the Mount with Peter discussing the future of the new centre. The establishment of the centre required that we must have a director of the centre and although I had started the centre and was on site full-time, I persuaded Peter that he should be the first director since he was the eldest and his expected one-day a week involvement seemed to be adequate to do the administrative duties. I was the first research director and I would be the second director in 1992. This arrangement would allow more time to concentrate on the many research projects underway. He agreed and was to be the first director and as planned, I took on the position after he retired.

It was in this time that Brad Hansen joined the laboratory as the chief technician. Brad has provided immeasurable help in keeping the laboratory problem free. The mass spectrometer that is the heart of all our work is very temperamental and requires much love. Brad provided this love in abundance and we have missed precious few days due to equipment failure.

After Peter retired in 1992, the centre was to gradually evolve into a nationally important core devoted to the development and delivery of exercise programs for the elderly. Don Paterson played the most important role in this new expansion. I was in most instances his helper in this new development.

Nancy Ecclestone who joined us in 1987 was to contribute to this area of the centre. I hired Nancy to administer the self-paced walking study and she became the Director of the Centre in 1993. Nancy was very able in securing needed funding for the centre. The centre that started as a research idea was to become an internationally known innovator of exercise programs.

This part of the centre has grown exponentially and in some ways has overshadowed the research arm. The centre remained at the mount until 2005 when it was divided into the research group that returned to the main campus and the service part remained at Mount St. Joseph.

John Kowalchuk joined our group in 1992 and Charles Rice returned from his work at Yale and McGill Universities. John's interests fit well with the work that

Don and I were doing on gas exchange kinetics. Charles developed a research programme on the ageing muscle.

I also spent two sabbatical leaves in 1988-89 in Physiology at Oxford University and in 1995-96 with Brian Whipp at St. George's Medical School in London and at The University of Toronto with Jim Duffin. This was a great period of solidifying the work in gas transport modelling, and respiratory controls. Once again, these sabbatical leaves contributed measurably to the research development at the centre.

Don Paterson was to take over the grant support from N.S.R.C in 2001 and continue to use ageing as the prime focus for the laboratory studies. This N.S.R.C. grant was probably the most important single thread that continued the Centre for Activity and Ageing. Without these funds, the idea of the centre would have been lost before we could have seen the development of the exercise outreach programmes.

**Finally:** I have now returned to Western as a retired professor working on some of our older studies from the self-paced walking research investigation and the 10 year follow-up. This large survey of elderly function carried out at our Thames Hall laboratory was to be repeated on a sub-set 10 years later at the laboratories in the Mount. The measurements included cardiovascular, strength, and exercise habits of men and women over 55 years of age.

In retrospect, I could not have carried out these studies and research work without the major help from Peter Rechnitzer and Don Paterson. Peter's early focus on rehabilitation of post-coronary patients the groundbreaking rehabilitation procedures that it spawned my interest in ageing and using older subjects to question established cardio-respiratory physiology ideas were very important, as were Don's continued interest and further development of the laboratory. The experiences from cardiac rehabilitation study lead to the development of the ageing ideas and the securing of an N.S.R.C. grant in 1981. This funding was critical for the sustainability of the centre, the establishment of a University Senate recognised centre, and allowed for the atmosphere that fostered the centre's outreach programmes that today make it a world recognised institution. The history of my research work at Western is linked to that of Peter Rechnitzer. At the beginning, Peter wanted to study the use of exercise as a rehabilitative tool in cardiac rehabilitation but needed the assistance of a physiologist to measure changes in cardiovascular function. My laboratory was the only facility at Western at that time so Peter needed my assistance or his research plans would have died prematurely. In a similar manner, I needed a physician to help with exercise regimens used in the measurement of cardio-respiratory function in my work with the elderly, and Peter agreed to help. Without a physician colleague my ideas for the ageing centre would have died. We worked hand-in-glove for over 20 years. I am sure that such a long term and successful partnership is rare. I was very fortunate to collaborate with Peter.

Today, in the laboratory research, Don and John Kowalchuk have continued to guide and develop the kinetic modelling and ageing studies. Their work has built on the older ideas that I brought to the laboratory. Additionally, the many graduate students played a major role. I have included their names at the end of

this record. Without them, the story would have been different and probably abbreviated to considerable degree. They contributed through their research work in the laboratory and in many cases were involved with exercise leadership that helped foster such programmes as the retirement research group.

The future for the centre seems to be unlimited. Thanks to the help from Peter, John Howard, and Don, I have seen my dream to develop a major research and service centre devoted to the physiology of ageing flourish beyond my simple expectations. I am proud to have started the centre and excited to witness its future contributions in both science and service.