



*Greetings from the
Scientific Director: Osteoporosis
– The “Silent Thief”*



Dr. Cyril Frank
Scientific Director

Like the broad range of musculoskeletal (MSK) diseases affecting Canadians, osteoporosis can seriously affect a person’s quality of life. Today, approximately 1.4 million

Canadians suffer from osteoporosis and it is expected that some forty per cent of women and 15 per cent of men over the age of 50 will develop this debilitating disease. While the physical and emotional toll is immeasurable, we do know that the economic cost of arthritis, osteoporosis and other MSK-related diseases is more than \$17 billion annually.

Osteoporosis generally occurs unexpectedly and for this reason it is called the “silent thief”. Take hip fractures for example. Each year, some 30,000 individuals suffer from a fracture of the hip - often the result of bones weakened by osteoporosis. Sadly, approximately 20 per cent of these individuals do not survive their injuries; and another 50 per cent never return to their homes or resume an active lifestyle.

continued on page 2

Searching for Synergies

CIHR directors meet their NIH counterparts

In the realm of biomedical research, the National Institutes of Health Research (NIH) is as impressive a ship as ever plied the seas of scientific knowledge - 27 institutes, billion-dollar budgets, state-of-the-art labs connected to premier clinical facilities, the best and brightest minds. By comparison, the Canadian Institutes of Health Research (CIHR) must be considered a sleek schooner that makes the most of its radical design and the cohesiveness of its able crew. Still, regardless of differences in scale, both vessels are charting much the same course, taking advantage of the same scientific currents. And more importantly, they have complementary expertise and similar priorities that make cooperation possible and desirable.

In late October, a two-day meeting in Bethesda, Maryland allowed CIHR’s senior executive and scientific directors to compare notes with their counterparts at NIH. “We had group meetings that covered our respective strategic plans,” IMHA Scientific Director Dr. Cy Frank reports, “and then I followed up with individual meetings with my two counterparts” at the National Institutes of Arthritis, Musculoskeletal and Skin Diseases (NIAMS), and Dental and Craniofacial Research (NIDCR).

NIH’s long-range strategic plan, the Road Map, has three main themes: New Pathways to Research, Multi-Disciplinary Research Teams of the Future, and Re-Engineering the Clinical Research Enterprise. Much of the thinking will be eerily familiar to those who know CIHR’s vision and mission. “Globally at NIH,” says Frank, “they recognize that CIHR is in the passing lane in terms of our approach to research, knowledge translation, pillar crossing, interdisciplinary multi-institute initiatives, built-in commercialization strategies. NIH aspires to that.”

Of course, there’s much to learn from NIAMS and NIDCR. Both are robust and well funded by Canadian standards, with NIDCR being the slightly larger and older of the two sister institutes. However, size is a relative term at NIH. According to Frank, “They still feel disadvantaged relative to the US GDP. NIAMS is one of the smaller institutes, and it has an annual budget of about a half-billion dollars. In fact, their whole budget is less than the *increase* that the National Cancer Institute receives each year.”

continued on page 2

Not surprisingly, this places tremendous emotional and economic pressure on everyone involved.

In an effort to expose this “silent thief”, the Osteoporosis Society of Canada has dubbed November “Osteoporosis Month”. Because osteoporosis may go undetected until a fall or some other minor incident leads to a serious fracture, increasing awareness is critical. Given that this is the “Bone and Joint Decade”, it is more important than ever that we take steps to increase awareness about osteoporosis. To this end, **IMHA On The Move** is pleased to feature current research by Dr. Rick Adachi and his colleagues at McMaster University (see *Gilding the BMD Gold Standard*) who are re-evaluating the effectiveness of the bone mineral density (BMD) scan – currently the best tool available to detect osteoporosis at an early stage.

Whether it's Osteoporosis month or any other month, we need to continue to work together to shed light on osteoporosis as well as the many other diseases and conditions of the MSK system. In so doing, we will be in a position to further the goals of the Bone and Joint Decade – to raise awareness about the growing economic burden; empowering patients to take control of their own health; and supporting research that will lead to improved prevention and treatment. ■

Synergies continued from page 1

Thus, of necessity, NIAMS and NIDCR have had to be very cost-efficient with their money adopting a strategic focus in their ongoing research enterprise. No surprise then that capacity building and training were among the main topics discussed. Also, the institutes' histories of growth and achievement provide valuable insight into which facilitation tools worked best in developing program models, RFA cycles and transdisciplinary collaboration.

continued on page 5

IMHA Stages Researcher/ Stakeholder Forum

UWO a hotbed of MSK research

Researchers at the University of Western Ontario had an opportunity to come together to help shape the future of musculoskeletal health research in Canada at an “Open Researcher/Stakeholder Forum” held at the University of Western Ontario on October 2, 2003.

Sponsored by the Institute of Musculoskeletal Health and Arthritis (IMHA) in conjunction with the University of Western Ontario (UWO), the forum was designed to allow for face-to-face interaction between scientists and the Institute. “We not only wanted to provide an update on our activities,” said IMHA’s Scientific Director, Dr. Cy Frank, “we wanted to give researchers an update on their own success rates within CIHR as well as an opportunity to provide the kind of feedback we need to develop a national research agenda in the area of musculoskeletal health.”

So, why was the forum held at Western? “Because Western is a hotbed of research related to our Institute,” said Frank, “and it’s also one of the top research groups in the country studying musculoskeletal health.” Dr. Nils Peterson, Western’s Vice-President (Research) echoed Dr. Frank’s comments noting that “we have an enormous presence in the Institute, from our research in oral health, rehabilitation research at the Fowler Kennedy Sports Medicine Clinic, research in physiology and bone, and our close interface with Robarts Research Institute to musculoskeletal health research.”

“Western was a logical choice because research in these areas is strong and therefore Western has a critical mass of scientists working in IMHA’s areas of interest,” said Dr. Ilona Skerjanc, a member of the Institute’s Advisory Board and an associate professor in the Department of Biochemistry who is currently studying the molecular mechanisms of skeletal muscle development.

The forum consisted of an overview of the Institute presented by Dr. Frank that also revealed some impressive statistics on Western’s research success rates in terms of CIHR funding. Researchers also heard from Dr. Graeme Hunter, who talked about the Oral Research Training and Health (NORTH) program. The forum was followed by a reception where researchers had an opportunity to talk to members of the Institute’s Advisory Board.



Dr. Ewa Cairns has an opportunity to express some of her personal views with Dr. Frank at IMHA’s Researcher/ Stakeholder reception.

continued on page 5

Building Cross Border Collaborations

an interview with Dr. Lois Cohen, PhD

IMHA was extremely fortunate to have Dr. Lois Cohen Ph.D., Associate Director for International Health and Director, Office of International Health from NIH's National Institute of Dental and Craniofacial Research (NIDCR) attend its October Advisory Board meeting. In addition to providing an overview of the Institute's history and future directions, Dr. Cohen agreed to participate in an interview with a member of IMHA's Advisory Board, Dr. James Lund, who is the Dean of the Department of Dentistry at McGill University. **IMHA On The Move**, is pleased to share with you the results of that interview – that also happens to support a meeting between NIH and CIHR in late November.

Dr. Lund: *Should NIH and CIHR work towards increasing cross-border collaborations?*

Dr. Cohen: By all means. In this age of globalization in communications, trade, finance as well as science and health, efforts to systematically address areas of collaboration related to biomedical, behavioral and health systems research would seem logical extensions to promote what can be positive outcomes and to prevent negative consequences of globalization's effects. Recognizing, of course, that each nation has legal requirements protecting its intellectual property and that each nation has other legal constraints which govern its ability to expend public funds for health science research, there are scientific opportunities which present themselves and which offer openings to leverage each nation's strengths to advance the common good in a more efficient and effective way than either nation can achieve by itself.

Dr. Lund: *How would you suggest that we proceed to achieve this goal?*

Dr. Cohen: It would seem that the first steps have already been taken as our agency leaders have initiated a series of "get-acquainted" meetings, involving the Directors of the NIH and the CIHR, followed by opportunities to share information about strategic planning documents and participation in selected advisory board meetings, and planning workshops. Staff members from NIH Institutes and Centers increasingly are being introduced to the new CIHR Institutes and staff. As personal relationships are formed and cultivated, it becomes increasingly easier for information flow to occur, sharing specific details of scientific programs, new initiatives, peer review and grants administration. I emphasize the aspect of personal relationships in particular, as printed information is readily available on websites, for example. The ability to understand the reasons for the generation of program announcements, requests for proposals and the like usually emerges best from personal discussions and the give-and-take between and among health science administrators as they work through ideas and projects in real time.

I am reminded of recent discussions about scientific peer review and how members of lay consumer groups can be brought into that process. The issue was raised as it emerged in real time, and information was exchanged about current procedures in use and experiences related to assessing those research applications. The opportunity to share "best practices" in extramural grant and contract administration helps both sides of the border: CIHR learns from the longer history of the NIH, but the NIH learns from the fresh approaches brought to bear from having virtual institutes and



Dr. Lois Cohen provides an overview of NIDCR's history and future directions.

the potential of new ways of performing a function. There is for both sides a clear incentive to "think outside the box" and come up with creative solutions that fortunately may be facilitated by advances in information technology.

Dr. Lund: *Are there any programs or mechanisms currently in place that we could utilize to facilitate this goal?*

Dr. Cohen: The advertising mechanisms that come to mind are the traditional ones used by the NIH and also adopted by CIHR: Program Announcements (PA); Requests for Applications (RFA); and Requests for Proposals (RFP). The PA serves to publicize to the research community, the areas of interest for which research project applications would be accepted for review (specific funds could be designated and set aside or not). The RFA serves as a very specific mechanism to solicit proposals and always is accompanied by set-aside funds. The RFP is the mechanism most often used to solicit contract proposals where the Government has a specific requirement and requires contractor(s) to carry out and implement those requirements. Aside from the latter contractual mechanism, the most common grant mechanism solicited by

continued on page 4

Building Cross Border Collaborations continued from page 3

the PA or the RFA is the traditional project grant (RO1). At the present time, Canadian researchers – as are researchers from many other countries having eligible institutions from which researchers can apply – are recipients of NIH RO1 support. They have competed with all other domestic and foreign applicants and have succeeded in obtaining scientifically meritorious scores which allow those applications to be processed for further review for policy and program relevance/priority, leading very often to awards.

Some of the RO1 awards include investigators from more than one country. A US-based investigator, for example, may have collaborators from Canada as well as other countries. (A sub-contract is one way that a recipient grantee can have research carried out in a country other than the one he lives in). The NIDCR instituted a new grant mechanism specifically targeted to facilitate the planning of international collaborative research, the International Collaborative Research Planning Grant (R21). When investigators from three or more countries come together to plan a common research protocol to address a scientific question that cannot be addressed effectively in any one country, this mechanism provides two years of support to design the specific protocol that ultimately could be submitted to the NIH and to other research sponsors for review. The recognition that international collaboration takes more planning, more resources and coordination emerged from our own experiences - planning and carrying out two very large multinational collaborative research projects with the World Health Organization and other national funders, including Canadian funders.

Dr. Lund: *Are there any programs that could be easily modified to allow joint funding?*

Dr. Cohen: Any number of programs

can be designed to allow joint funding. The NIH often invites collaborative funding for any given application as written in many of its announcements. The collaborative funding can come from other public agencies, the not-for-profit organizations and even the for-profits. Leveraging scarce resources to accomplish a research goal can be essential in some instances and very often in the context of clinical trials research. Recently the NIH's National Heart, Lung and Blood Institute had set aside funds for fiscal year 2004 to support cardiovascular disease research in collaboration with CIHR's Institute of Circulatory and Respiratory Health. While the initiative involves additional collaboration from other partners, the point I wish to make is that CIHR dollars will go to Canadian institutions, while NIH funds will support principal investigators from Canada or the US. This RFA is one model that might be used to begin collaborations. Subsequent initiatives can be considered as shared interests emerge among investigators from the initial solicitation.

The strategic planning documents of IMHA and the NIDCR respectively demonstrate common areas of research in at least two major areas: oral health research; pain and pain management.

Dr. Lund: *Do IMHA's strategic priorities fit with those of the NIDCR and those of other Institutes?*

Dr. Cohen: Certainly, the strategic planning documents of IMHA and the NIDCR respectively demonstrate common areas of research in at least two major areas: oral health research; pain

and pain management. While those are two broad areas, both might be framed in the context of the NIH Roadmap, which focuses on new pathways to discovery, interdisciplinary research teams of the future and re-engineering the clinical research enterprise. As Dr. Elias Zerhouni, Director of the NIH, articulated, "Through these new initiatives, we hope to remove some of the biggest roadblocks that are keeping research findings from reaching the public as swiftly as possible. These efforts cover a broad spectrum of points. Between the lab and the clinic; from basic biological research, such as determining protein structure, to the front line of clinical research."

It would seem that there might be unique opportunities in leveraging resources to maximize the accumulation of databases/libraries from genetic material to clinical cases, which in turn might be utilized by researchers in both countries. These databases and clinical registries might span areas from craniofacial anomalies to Sjogren's Syndrome to temporomandibular joint disorders. While NIH continues to build its internal capacity to address issues of pain research across many of its Institutes, this area also falls squarely in the strategic plan of IMHA. Exploring commonalities or complementary strengths between our countries' research communities might offer yet another window for broad-based collaboration involving several of the NIH Institutes included among the membership of the NIH Pain Consortium.

Dr. Lund: *How can we help patient and consumer groups in our two countries work together?*

Dr. Cohen: It might be that some of these groups associated with IMHA as well as NIDCR already work together across borders; a first step toward finding out might be to list all those groups known to each. Possibly bringing a few

continued on page 6

Synergies continued from page 2

“And we identified some potential areas of cooperation that we might co-fund and launch together within the next year or two,” says Frank, although it would be premature to be more specific. He admits IMHA is a bit behind some other institutes that announced collaborations at the meeting in Bethesda, “but we’re working closely with our American counterparts to make it happen”.

“In the meantime, it’s important that Canadian researchers realize that NIH currently puts more than \$60 million US per year into Canadian research. There’s no exclusion of Canadian researchers. In fact, they’re encouraged to apply for funds. The only requirement is that Canadian researchers have to demonstrate the uniqueness of their approach — that it’s something the Americans can’t do — so that NIH can justify sending money outside the US. Already there are IMHA researchers who have NIH grants.” ■

Researcher/Stakeholder Forum continued from page 2

Overall, the forum appeared to be a success. “This has been an opportunity to send a message straight to the top,” said Dr. Stephen Sims from Western’s Department of Physiology and Pharmacology, who happens to be one of seven Western researchers in a CIHR group in skeletal development and remodeling.

“I think the forum was illuminating,” said Bessie Borwein, Professor Emeritus in the Department of Anatomy & Cell Biology, “we discussed a mixture of successes and problems that we are facing.” Borwein went on to say that one of the biggest difficulties researchers face is getting their information to the public.

“The forum provided a very useful update on IMHA and CIHR funding,” said Hunter. “It is useful for the research community to see a breakdown of funding according to institution and to specific research areas.” In light of the forum’s success, IMHA researchers can look forward to similar sessions in the future. ■

A BRIGHTER FUTURE FOR OA RESEARCH

\$4.4 million awarded under CIHR’s “NET” program

The future just got a little brighter for those suffering from osteoarthritis (OA) with the announcement of a \$4.4 million program that will support the formation of three new research teams who will study various aspects of this debilitating disease.

Co-funded by the Institute of Musculoskeletal Health and Arthritis (IMHA) and the Canadian Arthritis Network’s (CAN), the OA NET program falls under the umbrella of the Canadian Institutes of Health Research’s (CIHR) New Emerging Team (NET) program. “The NET program is designed around the premise that two heads are better than one,” says Dr. Cy Frank, IMHA’s scientific director. “By encouraging Canada’s best and brightest to work together, this new program will help build a solid foundation to support future advances in Canadian health research.”

Today, more than three million Canadians have OA, and the incidence of the disease is only expected to increase as our population ages. This unfortunate reality is further compounded by the fact that there is no cure for the disease, nor are there any drugs to effectively treat it. As a result, current treatment options revolve around decreasing pain through the use of medication and exercise. In the most severe cases, affected joints must be surgically replaced.

“OA is a chronic, disabling disease that seriously affects quality of life and the ability to work thus creating an economic burden for all Canadians,” says Frank. “For this reason, it is critical that we undertake research that will lead to a better understanding of the causes, more effective treatments and a possible cure for this disease.” With this in mind, IMHA, CAN and The Arthritis Society (TAS) organized a major conference in April, 2002 to chart the future direction of OA research in Canada. The OA Consensus Conference attracted the interest of a broad range of stakeholders from arthritis researchers and trainees to allied health professionals, consumers and national and international pharmaceutical and biotechnology companies. At the end of the conference, consumers identified research on the causes of pain and fatigue as their top priority. The OA Net grants were thus created to support research in these critical areas. At CAN’s scientific meeting on November 15, OA NET grants were



IMHA and CAN take a minute to celebrate with the winners of the OA NET program. (from left to right: Dr. James Henry, Dr. Robin Poole, Dr. Gillian Hawker, Dr. Cy Frank and Dr. Jane Aubin. absent: Dr. John Esdaile)

continued on page 8

The Injury Initiative

many voices searching for a common language

Personal injury is the leading cause of death for Canadians aged 45 or under. Each year in Canada, personal injury claims 13,000 lives and hospitalizes an additional 200,000 people. The burden on resources is enormous, and the number of different professionals involved in injury prevention and control is legion: police, fire-fighters, paramedics, emergency-room staff, neuro- and orthopedic surgeons, operating-room nurses, rehab specialists, family physicians, public-health professionals, epidemiologists, statisticians, health-policy planners, to name a few.

“It seems to me that there’s tremendous potential in an approach to research and programming that takes advantage of incorporating these levels of expertise,” says Dr. Rob Brison, an emergency-room physician at Kingston General Hospital and injury researcher at Queen’s University. As co-chair of a recent series of consultation workshops held under the aegis of a joint initiative by CIHR and the Canadian Injury Research Network (CIRNet), Brison is uniquely placed to appreciate the diversity of stakeholders and their kaleidoscopic points of view: “There are many disciplines involved in managing injuries — from those primarily interested in preventing injury events through to those providing care in the ER and the rehab setting.” Currently there seems to be a difference in perspectives that separates those active in primary prevention (of the injury event) and secondary prevention (of injury sustained during the injury event; eg helmets, airbags) from those providing treatment for injuries in the acute care and rehab settings (after the event). But each group has perspectives and data that are crucial to the conduct of effective research and programming in Injury Control.

It will take a slight change in mindset to recognize treatment as the tertiary level in a three-tier “continuum of prevention.” And this might better enable those in acute-care settings to collect and record details on the circumstances surrounding injury events, which is needed to evaluate injury patterns and planning interventions. “If we can gradually build the perspective,” says Brison, “that there *is* a continuum of prevention, then the many disciplines active in Injury Control research and evaluation should find an easier path to common ground.” And ideally, prevention through treatment would close the circle by better informing health-policy developers and device designers about the patterns inherent in common injury-events — a type of multi-level reverse-engineering.

If front-line workers would routinely capture injury-event information (say, a car crash) to supplement the anatomical-injury information recorded in the ER, the analysis of these data would better define patterns that could be translated and applied by professionals involved in primary, secondary and tertiary injury-prevention.

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Building Cross Border Collaborations
continued from page 4

together to discuss how to proceed to work on a common agenda ...this could be one way to advance this notion. In the spring of each year, the NIDCR usually brings the patient advocacy groups together to share information about the Institute’s research and developments and needs of the patient advocacy community. That day - April 27, 2004 - might serve as an interesting venue and program to begin a dialogue with a few Canadian counterparts. Additionally, the NIH Director convenes a Council of Public Representatives to discuss key NIH issues. Those meetings might afford yet another opportunity to observe the interactions among science administrators, scientists and the public. The website might be of particular interest in that regard: www.copr.nih.gov.

These are just some thoughts from the top of my head, but certainly the subject of engaging consumer groups is a vital and critical part of developing and sustaining any health research enterprise. This subject needs to be maintained as an important agenda item for our future discussions.

Dr. Lund: Are there ways in which we could work towards engaging multinational organizations/corporations to partner with us?

Dr. Cohen: Certainly leveraging resources, especially as we move towards translational, clinical and community-based research is critical to ultimately being effective in the marketplace of goods and services. We have periodically asked representatives of corporate entities engaged in clinical research, in particular, to come to the NIDCR to help us think through effective strategies to engage dental students in clinical research and thus move them a little closer to a choice of research as a career. These workshops have helped us craft RFAs in pursuit of those objec-

continued on page 11

continued on page 8

The Queen's Golden Jubilee

IMHA board members receive royal recognition

IMHA IAB members Flora Dell and Denis Morrice, were recently honoured with the Commemorative Medal for The Queen's Golden Jubilee for their distinguished service to their fellow citizens, their community and to Canada. Presented to Flora and Denis at the Institute's October Board meeting, the medals were created to celebrate the Queen's Golden Jubilee as Queen of Canada, and to recognize the efforts of some 46,000 Canadians – those who have made Canada what it is today, and those who are continuing to build our country's future.

Flora Dell has contributed numerous volunteer hours towards the advancement of a variety of health initiatives. In addition to being a valued IMHA Board member, she was a member of the National Executive of the Osteoporosis Society of Canada; the founding member and past Chair of the Society's New Brunswick chapter; and the National Vice Chair of the Active Living Coalition on Physical Activity and Older Adults (ALCOA). Flora also sits on the following National Boards:

- The Canadian Centre for Physical Activity and Aging at the University of Western Ontario
- The Presidents Committee on Gerontology at St. Thomas University
- National Seniors Advisory Committee to ALCOA
- National Board of the Frosst Healthcare Foundation.

For 15 years, Flora acted as the Provincial Consultant for Special Populations (persons with disabilities and older adults) in the New Brunswick Provincial Government. She has been involved on a national level (Department of Health Canada) with the effective merger and

policy development of three national organizations, and was a principal reviewer on policy on the Active Living Coalition of Older Adults. Flora also worked on the international scene as a consultant for CIDA, and authored and co-authored books on Access for People with Disabilities and the Healthy Active Living Program for Older Adults for the Province of New Brunswick. In 2002, she received a citation from the Frosst Healthcare Foundation and was also the recipient of a Builder's Award from the Osteoporosis Society of Canada. Flora is also a life member of the Canadian Hunger Foundation.

Like Flora, Denis Morrice has given a tremendous amount of his personal time towards improving the health of Canadians. The Institute's Board member responsible for IMHA's finances, Denis is also the President and Chief Executive Officer of The Arthritis Society. Notwithstanding his devotion to these respective organizations, Denis also finds time to contribute to the following committees:

- Health Charities Council of Canada (HCCC), Research and Scientific Advisory Committee
- Board member for the Canadian Arthritis Network, Networks Centre of Excellence (CAN/NCE)
- Board member for the National Blood Safety Council (NBSC)
- Board member for the Canadian Joint Replacement Registry (CJRR), Advisory Board
- Board member for the Arthritis Research Centre of Canada (ARC), British Columbia



Denis Morrice and Flora Dell join Dr. Frank at the Researcher/Stakeholder reception after receiving their Commemorative Medals.

- Co-Chair, Best Medicines Coalition (BMC)
- Advisory Board Member, Institute for Population Health, University of Ottawa
- Committee member, Medical Marijuana Committee, Health Canada
- Played a key role and was instrumental in establishing www.arthritis.ca

“On behalf of IMHA, we would like to extend our personal congratulations to these two outstanding individuals,” said IMHA's Board Chair Juliette Cooper. “There are no two individuals more deserving of this award, and IMHA has truly benefited from their involvement.” ■

A BRIGHTER FUTURE FOR OA RESEARCH continued from page 5

presented to three independent research teams who will explore various aspects of the disease over a five year period. Here's a brief snapshot of our three top peer-reviewed NETs.

And The Winners Are:

Dr. John Esdaile of the Arthritis Research Centre of Canada in Vancouver will receive \$1.5 million to develop tools to detect OA at an earlier stage than it is currently diagnosed. This will make early intervention possible which limits the consequences of the disease. The research team includes experts in diagnostic blood tests for OA, state-of-the-art X-ray scanners, treatment of OA and measurement of important aspects of the

disease such as limitations on activities, costs, and psychological consequences.

Dr. Gillian Hawker of Sunnybrook and Women's College Health Sciences Centre in Toronto will receive \$1.4 million to look at the determinants and consequences of pain and fatigue in OA using a biopsychosocial approach. A multidisciplinary team of health researchers will explore the relationship of pain, fatigue, sleep and mental health in OA in relation to factors such as coping strategies, family support and the use of established treatments. The results will enable the development of new treatments, targeted to individuals in the context of their families and the community as a whole.

Dr. James Henry of the University of Western Ontario in London will receive \$1.5 million to look at the molecular mechanisms of pain and fatigue in OA in the nervous system and joints. His research team will identify the chemicals that are altered in and around the joint at different stages of OA, which may generate pain. The project will also determine the effects of chemicals released by peripheral nerve terminals on joint tissues. This work will help identify new targets to alleviate pain and prevent tissue destruction in OA. ■

Building Cross Border Collaborations continued from page 6

tives. We have also included language in our announcements that indicates that collaborative research funding is desirable and might enhance the prospects for NIDCR funding, should a score be scientifically meritorious but on the borderline of our available funds. Hypothetically, there might be two grants with equal scientific merit scores but one may include collaborative funding. That application might ultimately be funded ahead of the other because it can leverage more resources and thus move the project ahead more efficiently and effectively.

A basic premise in stimulating collaborative funding is that the funds are directed to the principal investigator team working in the extramural community. Those leveraged funds are not intended to flow into the NIH itself, but rather to the research institutions and teams of scientists that compete for our funds. We might have working relationships with Foundations. For example, it might be agreed that the Foundation approach or advertise to the community that they

are willing to review, and possibly fund, the peer review summary statements of NIH applications that missed funding. There are many arrangements possible and many models to share of how Government, Foundations and For-Profit entities have worked together.

Dr. Lund: *Based on your years of experience at NIDCR, what advice can you give us overall that might help IMHA further its goals?*

Dr. Cohen: Communicate, communicate, communicate! Of course, you are doing this already and it was a wonderful privilege to participate in the October meeting of the IMHA Board as well as its stakeholders meeting in London, Ontario. Having Dr. Joan McGowan from our National Institute of Arthritis, Musculoskeletal and Skin Diseases (NIAMS) sit as a regular member of the Board serves to keep the dialogue active. Mutual learning on the spot when the issues arise is the best way to focus the questions and arrive at viable alternatives, hopefully finding unique solutions

that fit ever-evolving programs.

The notion of virtual institutes is very exciting and we at NIH have as much to learn from you as the other way around. One way to do that is to rotate people back and forth, perhaps with some regularity so there are relationships that can be nurtured, and that there is variety in perspectives. If we can exchange health science administrators perhaps for even longer periods, this might be beneficial. While I served as Director of Extramural Research at NIDCR, we hosted a few such administrators from outside the US who wished to learn in detail how our processes work. There is a wealth of information needed for wise decision-making and it basically takes wise and committed staff who are dedicated to science and public service. My brief exposure to your staff would certainly indicate that you are recruiting well. And when there is a will to collaborate and help each other, there are many ways to reach those goals. ■

The SIRC Research Award

call for sport research papers

The Sport Information Resource Centre (SIRC) leads the world in sport, fitness and sports medicine information provided through their bibliographic database SPORTDiscus. For 30 years, SIRC has been identifying, organizing and disseminating sport and fitness information through a variety of products and services.

In commemorating 30 years of excellence, SIRC is pleased to announce the creation of the SIRC Research Award. From basketball to goalie masks, zippers to pace makers, coaching to volunteer development, Canadian research has changed the world of sport. The SIRC Research Award will recognize Canadian innovations in sport related research.



For more information on how to qualify for this award, please visit: www.canadiansport.com

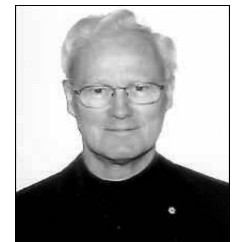
IMHA Welcomes New IAB Members

Jan Peter Dutz MD FRCP (C)



Dr. Dutz is an Associate Professor in the department of medicine at the University of British Columbia with appointments in the divisions of dermatology and rheumatology. He is also a staff research scientist at British Columbia's Research Institute for Children's and Women's Health with a research focus on the skin's role in modulating the immune system. Dr. Dutz has a special clinical interest in the cutaneous manifestations of autoimmune connective tissue diseases.

Dr. Douglas Kinsella CM MD FRCPC



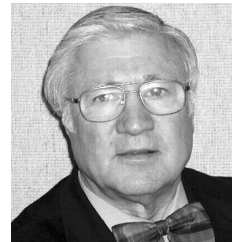
Dr. Kinsella is President of Medethix Consultations Inc., providing consultation in the ethics of health research and policy to agencies, industry and governments. He is also a Professor Emeritus of Medicine and Medical Bioethics at the University of Calgary and the former Director of Medical Bioethics and Professor of Medicine, at the University of Calgary. Dr. Kinsella's clinical and research interests encompass rheumatology and immunology, medical education and governance and ethical issues inherent in human experimentation, euthanasia and risk management. Currently, he is a co-investigator in a CIHR funded research project dealing with the governance of human research.

Dr. John McDermott



Dr. McDermott is an Associate Professor in the department of Biology at York University. For the past 18 years, he has worked on molecular and biochemical aspects of muscle physiology and development with a focus on the regulation of gene expression under normal and pathological conditions. His research has led to the isolation of key genes involved in the embryonic development of heart and skeletal muscle, and is being pursued with collaborators at The University of Rome "La Sapienza" King's College, London, and Columbia University in New York. He is currently a member of CIHR's Cardiovascular A Grant Selection Committee.

Morris (Mickey) Milner PH.D. P.Eng, C.C.E.



Dr. Milner is currently the Director, Ontario Rehabilitation Technology Consortium that links rehabilitation facilities, academic centers, consumers, and manufacturers in the development and commercialization of assistive technologies. He is also a consultant on rehabilitation science and technology, and a Professor in the departments of Mechanical Engineering, Rehabilitation Science, Surgery, and the Institutes of Biomaterials and Biomedical Engineering, and Medical Science at the University of Toronto. Dr. Milner has held academic and research appointments in South Africa, Canada, and the USA.

Gilding the BMD Gold Standard

bone geometry may better predict hip fractures

Osteoporosis (OA) is an insidious disease that often goes undetected until a fracture heralds its arrival. Today, OA researchers like Dr. Rick Adachi are seeking ways to prevent, treat and predict its occurrence. Let's take a closer look:

The high morbidity and mortality associated with osteoporotic hip fractures makes it paramount to accurately predict who is at highest risk — all the more so, since the incidence of hip fractures is expected to double by 2025.

Currently, the gold standard for assessing fracture risk is bone mineral density (BMD), a quantitative measurement derived through dual-energy x-ray absorptiometry (DXA). “The more mass you have, the more strength you have. That’s how simplistically we looked at things not too long ago,” says McMaster University’s Dr. Rick Adachi, who along with principal investigator Jacques Brown at Laval University and post-doc fellow Shawn Davison, is re-evaluating the accuracy of BMD.

Recent clinical trials of drugs that increase BMD (such as bisphosphonates) have revealed that changes in BMD do not reliably predict fracture-reduction rates. Despite their almost uniform anti-fracture efficacy (40–60 per cent), different drugs can have different effects on BMD change (0–8 per cent per year). Further analysis of the data suggests that increases in BMD account for only 15–30 per cent of the reduction in fracture-rate, which means that other important factors are at play.

Bone strength is determined by its “material properties, internal trabecular architecture and overall geometric structure,” says Adachi, who is par-

ticularly interested in the latter since it can be easily analyzed in vivo. Some general principles of bone geometry dictate bone strength: a wider bone is stronger than a narrower bone of equal length, and a shorter bone is stronger than a longer bone of equal width. To a great degree, bone geometry is shaped by body mass or loading. The main mechanical stresses placed on long bones like the femur, Adachi explains, are “during bending moments. In a long bone undergoing bending or twisting, the strain is lowest at the central axis and increases radially outward to the periosteal surface, where strains are the highest.”

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From a mechanical-engineering perspective, tubes fracture in two ways when bent beyond tolerance: in a thick-walled tube, a stress crack spreads inward from the outer curvature (convex surface) of the arc; whereas in a thin-walled tube, the wall buckles inward on the inner curvature (concave surface) of the arc.

“Sub-periosteal resorption is unknown in adults,” says Adachi, “so bone cannot decrease in diameter. Rather, it’s the cortical and trabecular bone tissue that thins with normal aging, from the inside out. If you think of a cross-section of bone as a donut, it’s as if the hole in the donut was getting larger and larger.”

As a person ages, bone is deposited on the periosteal surface and resorbed from their endosteal surface in an attempt to maintain mechanical integrity. Smaller amounts of periosteal bone

apposition can biomechanically offset larger amounts of endosteal resorption, since the mass is being placed further from the central axis of bending.

Thus, long bones become wider as aging progresses and the body continues its attempts to preserve mechanical sufficiency. But the cortical bone also continues to thin. The mechanical strength of the bone can be accurately predicted by the section modulus, which is defined as the cross-sectional moment of inertia divided by half of the subperiosteal width.

Osteoporosis accelerates this hollowing process until the buckling threshold is rapidly reached. When the cortical thickness approaches a tenth of the bone’s radius, the probability of fracture (similar to local buckling in a thin tube) is precipitously increased. The thin wall of bone can no longer withstand bending or twisting and collapses in on itself, especially at the ends of long bones where fractures most often occur.

To prove their hypothesis that femoral section modulus and buckling ratio are sensitive predictors of hip fracture, the research team is analyzing about 10,000 hip scans gathered by the 1997 Canadian Multi-centre Osteoporosis Study (CaMOs), correlating baseline DXA data with all hip fractures experienced during the subsequent five years.

“My gut feeling is that fracture risk in this study will turn out to be a mix of BMD and bone geometry,” says Adachi. If their theory is validated, “we could then input an algorithm into densitometers that would add a bone-geometry figure to the BMD figure, which when combined would give us a more valuable and accurate estimate of fracture risk.” ■

translated and applied by professionals involved in primary, secondary and tertiary injury-prevention. The impact of such research would be felt in comparatively short order. Priorities for research and prevention would be based on improved surveillance. Public-safety messages could be honed and better targeted (Drive Sober), designs of protective gear refined (standard side-impact airbags) and ER protocols adjusted.

For example, a caved-in driver's door from a side-impact crash would be expected to cause certain types of injuries. "We have some sense that 'T-Bone' crashes to the driver are more often associated with injuries to the left arm, left chest, thoracic aorta, head and spleen," says Brison. "I think we could improve the speed and quality of trauma-care provided if we better defined the relationships between mechanism of injury and resulting patterns of anatomic injury." In anticipation of the type of injuries sustained by a T-boned driver, simple preparations in the trauma room could include having the IV nurse standing on the patient's right and the chest-tube tray set up on the left.

Brison believes that, if the many sectors of injury prevention and control could become more cohesive under the banner of the Injury Initiative, then there is huge potential to conduct "cross-cutting, multi-disciplinary research programs — big programs that have the potential to do world-class work through a bit of planning and cooperation. By putting people together, you get their shared experience, and after a while you also get to see what's important to other people and what collective priorities can be addressed. There's ample room for interdisciplinary work with IMHA researchers around fracture prevention and management. The potential for research on the many patterns of soft-tissue injury seen in our ER's is virtually untapped."

So how does IMHA fit into the big picture of injury prevention? High- and low-impact fractures, soft-tissue injuries, secondary osteoarthritis, thermal injuries and rehab therapy are among the more obvious connections. "Right now there's a focus on neural and brain injuries, because there's a lot of competency in that area in Canada," says IMHA's Scientific Director, Dr. Cy Frank, who's on the Injury Initiative's scientific advisory committee. "My job is to build capacity in the under-developed MSK area through RFAs and other development tools once the Initiative's priorities have been identified."

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According to Philip Groff of SMARTRISK (the national injury-prevention association that helped facilitate the workshops), one emerging priority from rehab professionals is developing "methodologies that help them quantify the effects of what they're doing in the clinic. It would have to be a mix of qualitative and quantitative research, because a rehab intervention is much more complex than a drug intervention. You'd have to capture the full psycho-social aspects of the rehabilitation process and still have the rigour and respectability of a randomized clinical trial."

There's also a lot to consider in primary prevention. Unintentional injuries among older adults aged 70 or over — most often falls — present a special challenge for primary prevention, says Groff, whose background is in cognitive neuropsychology, "because they tend to be set in their ways and resistant

to change. By the same token, they're strongly motivated to remain independent. That's the real issue for them. So accent the positive; Wear the hip protectors and pick up the throw rugs so that you remain independent. The messages have to focus on the benefits."

Given Canadian injury statistics, there remains a great deal of work to do at all levels of injury — especially since there is increasing evidence that the majority of injuries aren't unfortunate "accidents" but are predictable and preventable events. ■

Bone & Joint Decade News

IMHA's SD receives research funding relations award

IMHA's Scientific Director, Dr. Cy Frank, was recently honoured with a Bone and Joint Decade (BJD) "Research Funding Relations" award presented by the Canadian National Action Network at the 2003 BJD World Network Conference in Berlin October 30-November 2. In accepting the award on behalf of Dr. Frank, Dr. James Waddell, Canada's National Action Network Coordinator noted that, "Dr. Frank has been a tireless supporter of the Bone and Joint Decade in Canada, and we are deeply grateful for all of the work he has done to encourage others to rally around this important cause."

Formally launched by the World Health Organization on January 13, 2000 (and endorsed by the United Nations in 2000) the year's 2000-2010 have been officially designated as the "Bone and Joint Decade". With the endorsement by the Honourable Anne McLellan, Minister of Health, Canada became a supporter of this important movement in late 2002. The Canadian National Action Network currently represents over 25 national partner organizations.

"The Bone and Joint Decade is a particularly important one for anyone involved in MSK health," said Frank. "For the Decade to be a success, we need to pull together to raise awareness and support research that will find ways to prevent, treat and ultimately cure these debilitating conditions." ■



Request for Applications (New)

Early in December, the Institute of Musculoskeletal Health and Arthritis announced the release of three new Request For Applications (RFAs) under the umbrella of the New Discoveries; Invention-Tools, Techniques and Devices for Research and Medicine and Team Planning and Development Grants programs. The following provides a brief synopsis of these RFAs. Further details can be found by visiting: <http://www.cihr-irsc.gc.ca/e/services/15761.shtml>.

New Discoveries

The purpose of this program is to encourage novel, innovative, and inventive research. Successful applications must be unique, original, and/or extraordinary and of excellent quality and potential. The value of a single grant is \$60,000 per year (including equipment) for two years. The Institute of Musculoskeletal Health and Arthritis has allocated up to \$300,000 per annum for this program.

Invention – Tools, Techniques and Devices for Research and Medicine

One of the goals of the Institute of Musculoskeletal Health and Arthritis is to stimulate inventive research projects aimed at (i) developing tools and techniques to aid biomedical research and (ii) promoting the invention of devices that may aid the diagnosis or treatment of patients. The purpose of this initiative is to provide support to individuals or teams whose projects will address the identified research areas. Up to \$500,000 is available up to a maximum per grant of \$100,000 per annum including equipment.

Team Planning and Development Grants "Developing New Research Teams to Enhance the Quality of Life"

Team Planning and Development Grants are designed to support the planning and/or developmental activities of multidisciplinary and/or cross pillar research teams interested in addressing IMHA's three research themes: Physical Activity, Mobility and Health; Tissue Repair and Replacement; and Pain, Disability and Chronic Diseases. Applications relevant to both Health Canada's Natural Health Products Directorate (NHPD) and IMHA's research themes will be funded on a partnership basis. Funding from IMHA is contingent upon availability of funds. NHPD will contribute a total of \$100,000, \$50,000 in both 2004 and 2005 for applications relevant to the joint research objectives of both NHPD and IMHA. The maximum amount per grant is \$100,000. For further details on the Team Planning and Development Grants, please visit: <http://www.cihr-irsc.gc.ca/e/services/19559.shtml> ■

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