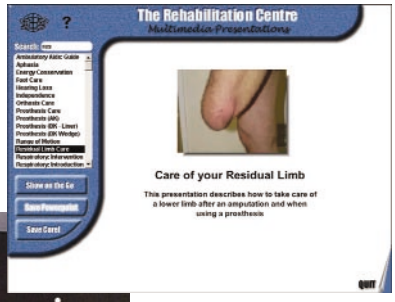
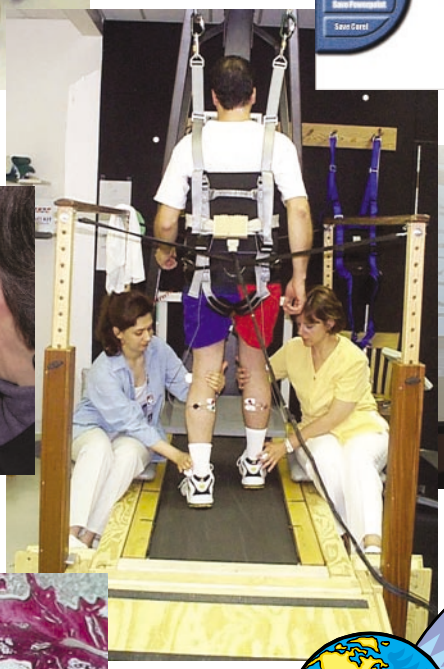
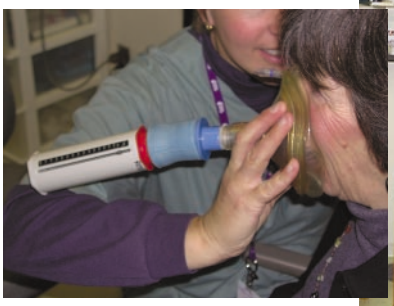
RESEARCH & DEVELOPMENT

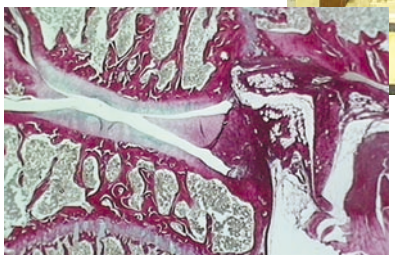
INSTITUTE FOR REHABILITATION RESEARCH AND DEVELOPMENT

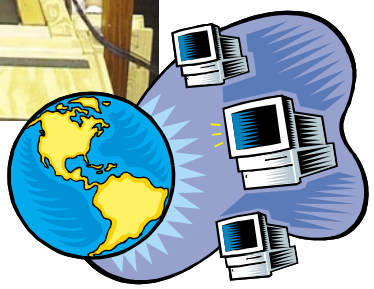
2001-2002 Annual Report











The Rehabilitation Centre / Le Centre de réadaptation

A SUBSIDIARY CORPORATION OF THE OTTAWA HOSPITAL
UNE CORPORATION AFFILIÉE À L'HÔPITAL D'OTTAWA

This report reflects work completed or in progress between January 1, 2001 and March 31, 2002.

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The full report will be available on our website as of August 2002:
http://www.rehab.on.ca/irrd

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Message from the Physiatrist-in-Chief/Message du physiatre en chef

DANIEL DEFORGE

This year we have made the transition from The Royal Ottawa Health Care Group to The Ottawa Hospital. This has facilitated the continued integration of clinical practice and consolidated the role of rehabilitation along the care continuum.

Within the IRRD it has been an exciting time as we reaffirm our academic mission and processes in this new context. Change occurs regardless of whether it is driven from within or without. Our sense of value lies in the firm belief that health research is about care as well as cure, that quality of life is a valuable outcome measurement, and that research into wellness and independence is paramount. Much of our research is done in partnership with investigators across the continuum, from acute care in the emergency room to the management of end of life issues with our clients.

Our research models continue to be driven by our treatment model. We can take this opportunity to partner with our colleagues from clinical care and academia, and also to continue our strong collaboration with consumers of rehabilitation, as we have much to learn from each other. Happy year of the horse.

Cette année, nous avons réalisé la transition entre le Service de santé Royal Ottawa et L'Hôpital d'Ottawa. Cet exercice a favorisé l'intégration continue de la pratique clinique et a permis d'aligner le rôle de la réadaptation sur le continuum des soins.

À l'Institut de recherche et de développement en réadaptation, nous avons réitéré avec ferveur notre mission et nos procédés d'enseignement dans ce nouveau contexte, car le changement est inéluctable, qu'il soit d'origine interne ou externe. Notre échelle des valeurs repose sur notre ferme conviction que la recherche en santé est axée autant sur les soins que sur la guérison, que la qualité de vie constitue un précieux outils de mesure des résultats et que la recherche du bien-être et de l'autonomie est primordiale. Un grand nombre de nos recherches se font en partenariat avec des chercheurs qui se trouvent tout au long du continuum, depuis les soins de courte durée à l'urgence jusqu'à la gestion avec nos clients des questions rattachées au terme de la vie.

Nos modèles de recherche sont toujours fondés sur notre modèle de traitement. Nous pouvons donc saisir cette occasion pour établir des partenariats avec nos collègues des soins cliniques et du milieu de l'enseignement, et afin de poursuivre notre grande collaboration avec les patients en réadaptation, car nous avons tant à apprendre les uns des autres. Bonne année du cheval!

Message from the CEO/Message de la PDG

CATHY DANBROOK

The academic mandate of The Rehabilitation Centre is important to our ongoing success. The work undertaken by our researchers, clinicians and managers is valued not only for the pursuit of new knowledge but also for the contribution made to developing best practice standards in the field of rehabilitation. As well, the work done in partnership with other collaborators enriches the experience. The achievements highlighted in this Annual Report are, once again, outstanding and commendable. The IRRD continues to promote The Rehabilitation Centre as a learning environment where acquiring, sharing and recognizing new knowledge is an integral part of our culture.

My thanks to all of you who have taken part in research and development activities again this year and to Dr. Jamie MacDougall and Dr. Dan DeForge for your leadership. We are proud of your achievements.

Notre succès à long terme repose en grande partie sur le mandat académique du Centre de réadaptation. Le travail entrepris par nos chercheurs, nos cliniciens et nos gestionnaires est apprécié non seulement du point de vue de l'acquisition de connaissances nouvelles, mais également de celui de la contribution à l'élaboration de normes relatives à des pratiques exemplaires dans le domaine de la réadaptation. En outre, le travail accompli en partenariat avec nos collaborateurs vient enrichir l'expérience. Les réalisations soulignées dans le présent rapport annuel sont, une fois de plus, extraordinaires et dignes de mention. L'Institut de recherche et de développement en réadaptation (IRDR) continue à promouvoir le Centre de réadaptation en le dépeignant comme un environnement d'apprentissage où l'acquisition, le partage et la reconnaissance de connaissances nouvelles font partie intégrante de notre culture.

Je tiens à remercier tous ceux d'entre vous qui ont participé une fois encore cette année aux activités de recherche et développement et je tiens à souligner le leadership dont ont fait preuve les docteurs Jamie MacDougall et Dan DeForge. Nous sommes fiers de vos réalisations.

Message from the Director of Research/Message du directeur de la Recherche

JAMIE MACDOUGALL

During the past year, The Rehabilitation Centre became a subsidiary corporation of The Ottawa Hospital. We are very fortunate that during the negotiations support for research has always been a priority. We look forward to working with the TRC Board, with Mr. Ray Hession as Chair, as we continue to develop IRRD as an independent corporation.

The IRRD remains a significant part of the large family of research institutes that are affiliated with the University of Ottawa. We continue to be active in maintaining our close links with The Ottawa Health Research Institute and the other research institutes, some of which are themselves concerned with rehabilitation research.

Ethics review is an important part of the research process and we have been careful over the period of transition to examine the functioning of our Research Ethics Board (REB). To this end, we have had numerous meetings with the Chair of the Ottawa Hospital Research Ethics Board, Dr. Ray Saginur. We have agreed that IRRD will maintain its own separate REB for the foreseeable future. We have taken many steps to improve our procedures and harmonize them with The Ottawa Hospital REB procedures and have become an active member of the Council of Research Ethics Boards (Ottawa). We are also active in looking for areas of synergy and cooperation between The Ottawa Hospital REB and the TRC REB. I would like to thank all the members of the REB, in particular Dr. Shawn Marshall, the Chair, for their efforts in ensuring that all our projects adhere to high ethical standards set by the Tri-Council policies and procedures.

Our focus on client-centered research continues. We take pride in the level of input and participation of the clients at our centre in many aspects of the research effort. In particular, we acknowledge the close relationship with the Disability Awareness and Prevention Program (DAPP) and in particular we would like to thank Mr. Timothy Andrade, DAPP Coordinator, for his valuable input during the year.

Our researchers have been particularly active and successful in obtaining grants this year and I thank them all for their outstanding efforts. Many of our researchers are very busy clinicians and research time often requires a very personal commitment on the part of the staff involved.

Apart from principle investigators, many of the clinical staff do work on research teams or other support work and again, without that sort of extraordinary commitment, we could not be successful in our research efforts. I thank them all.

Once again, we thank the Royal Ottawa Health Care Foundation for its efforts with the Labatt 24 Hour Relay and we look forward to working with that foundation over the next year, as well as exploring funding options for following years. This year we are preparing a strategic plan to take us into the next exciting period in our development and obtaining adequate funding will be a priority.

I would like to thank Cathy Danbrook, CEO of TRC for her strong support of our efforts and as well, Dr. Dan DeForge, Physiatrist-in-Chief, who apart from being an active researcher himself, is a very strong supporter of all our research and development efforts.

This has been a very busy and challenging year from an administrative point of view. Our support staff have worked very hard and diligently to ensure the success of the functioning of the Institute. This year, Sue Balmer has taken on an increased role in coordination of various activities related to the REB work and in other areas of research activity and is taking a lead on program evaluation. Welcome Sue!

Finally, I would like to thank the excellent administrative support staff for their dedication and hard work during the year. Our secretary, Debra Schleyer is involved in virtually every aspect of the operation and on behalf of all the researchers I thank her for her excellent work. Dorothyann Curran provides invaluable research assistance to many projects and Carolynn Cook, in addition to taking the main responsibility for the production of this report, is involved in many other important aspects of the functioning of the IRRD. I sincerely thank them all for their efforts.

Au cours de la dernière année, le Centre de réadaptation s'est joint à L'Hôpital d'Ottawa à titre de corporation affiliée. Fort heureusement, durant les négociations, l'appui accordé à la recherche est toujours demeuré prioritaire. Nous nous réjouissons de collaborer avec les membres du Conseil d'administration du Centre présidé par Monsieur Ray Hession, alors que nous continuerons à développer l'IRDR comme une société indépendante.

L'IRDR demeure un membre important de la vaste famille d'instituts de recherche affiliés à l'Université d'Ottawa. Nous continuons d'entretenir activement d'étroites relations avec l'Institut de recherche de L'Hôpital d'Ottawa ainsi qu'avec les autres instituts de recherche, dont certains effectuent eux-mêmes des recherches dans le domaine de la réadaptation.

La révision déontologique constitue une part importante du processus de recherche et nous avons pris bien soin,

durant la période de transition, d'examiner le fonctionnement de notre Comité d'éthique pour la recherche (CER). À cet égard, nous avons eu de nombreuses rencontres avec le président du Comité d'éthique pour la recherche de L'Hôpital d'Ottawa, le docteur Ray Saginur. Nous nous sommes entendus sur le fait que l'IRDR conserverait son propre CER dans un avenir rapproché. Nous avons pris de nombreuses mesures afin d'améliorer nos procédures et de les harmoniser avec celles du Comité d'éthique pour la recherche de L'Hôpital d'Ottawa et sommes devenus un membre actif du Conseil des comités d'éthique de la recherche (Ottawa). Nous recherchons également activement des secteurs de synergie et de coopération entre le CER de L'Hôpital d'Ottawa et celui du Centre de réadaptation. Je tiens à remercier tous les membres du CER, en particulier le docteur Shawn Marshall, président, pour les efforts déployés afin que tous nos projets soient conformes aux rigoureuses normes d'éthique établies par les politiques et les procédures des trois Conseils.

Nous continuons à mettre l'accent sur la recherche axée sur les clients. Nous sommes fiers du degré d'intervention et de participation des clients dans notre centre relativement à plusieurs aspects de l'effort de recherche. Nous reconnaissons tout particulièrement l'étroite relation que nous entretenons avec le Programme de sensibilisation et de prévention des incapacités (PSPI) et nous tenons à remercier Monsieur Timothy Andrade, coordonnateur de ce programme, pour son inestimable apport durant l'année.

Cette année, nos chercheurs ont été particulièrement actifs, réussissant en outre à obtenir des subventions. Je tiens à les remercier pour tous leurs extraordinaires efforts. Plusieurs d'entre eux sont des cliniciens à l'horaire très chargé et consacrer du temps à la recherche demande souvent un engagement personnel de leur part.

Outre les principaux chercheurs, plusieurs membres du personnel clinique oeuvrent au sein d'équipes de recherche ou autre travail de soutien et une fois encore, sans cet incroyable engagement de leur part, nos efforts de recherche ne sauraient être fructueux. Je tiens à tous les remercier.

Nous réitérons nos remerciements envers la Fondation des Services de santé Royal Ottawa pour les efforts fournis dans le cadre du Relais 24 heures Labatt et nous sommes impatients de travailler avec cette fondation durant la prochaine année et d'explorer les options de financement pour les années suivantes. Nous préparons cette année un plan stratégique qui nous mènera dans la prochaine et excitante étape de notre développement. L'obtention d'un financement approprié sera une priorité.

J'aimerais remercier d'une part Cathy Danbrook, PDG du Centre de réadaptation pour son solide appui envers nos efforts, et de l'autre, le docteur Dan DeForge, physiatre en chef, qui outre le fait qu'il soit lui-même un chercheur actif, est un partisan convaincu de tous nos efforts en matière de recherche et développement.

D'un point de vue administratif, l'année qui vient de s'écouler a été riche en projets et en défis. Le personnel de soutien a travaillé d'arrache-pied, faisant preuve de beaucoup de diligence pour assurer le succès de l'Institut. Cette année, Sue Balmer a vu sa charge de travail augmenter en assurant la coordination de diverses activités liées au travail du CER ainsi que dans d'autres secteurs de recherche et en travaillant à l'évaluation du programme. Bienvenue Sue!

En dernier lieu, je désire remercier l'excellent personnel de soutien administratif pour leur dévouement et leur acharnement au travail durant l'année. Notre secrétaire, Debra Schleyer, prend part à pratiquement tous les aspects de l'exploitation. Au nom de tous les chercheurs, je la remercie pour son excellent travail. Dorothyann Curran nous offre un appui inestimable dans le cadre de plusieurs projets et Carolynn Cook, en plus d'assumer la principale responsabilité pour la production du présent rapport, prend également part à plusieurs autres aspects importants du fonctionnement de l'IRDR. Je les remercie tous très sincèrement pour leurs efforts.

The Rehabilitation Centre

The Rehabilitation Centre (TRC) specializes in the rehabilitation of people with physical disabilities. The Centre serves the residents of Eastern Ontario and Western Quebec in both official languages and is a fully accredited teaching hospital affiliated with the University of Ottawa.

The Centre provides inpatient, outpatient and outreach services for people with amputations, brain injuries, spinal cord injuries, strokes, lung disease, multiple sclerosis, chronic pain and communication disorders among others. The programs and services offered at TRC aim to help clients achieve as much independence as possible. These include:

- The *Acquired Brain Injury Program* (ABI) provides services to individuals who have suffered a traumatic brain injury and those with acquired brain injuries such as subarachnoid haemorrhages, anoxic injuries, and herpes encephalitis. In addition, the ABI program serves younger stroke clients with pronounced cognitive and/or behavioural impairment, and dual diagnosis (ABI and psychiatric diagnoses) clients. The program is designed to maximize function through goal oriented therapeutic interventions that address clients' cognitive, behavioural, psychosocial and physical needs.

- The *Amputee Program* assists clients who have upper and/or lower extremity amputations. Specialized rehabilitation services, including assessment, preventative measures, treatment, and discharge planning are provided to promote optimal level of functioning.

- The *Comprehensive Pain Management Programs* are designed to help clients reduce the degree to which pain controls their lives by changing they way they react to it. The goals of the programs are to help clients increase their understanding of chronic pain, increase activity, help them remain active despite pain, increase fitness levels, decrease the use of pain medication and set appropriate work, family, leisure and social goals.

- The *Electrodiagnostic Service* provides mainly outpatient services to individuals exhibiting signs or symptoms of nerve or muscle dysfunction, including numbness, tingling, pain, weakness, or some combination of these. Using electromyograpy (EMG), physiatrists and EMG technologists are able to find objective evidence of nerve or muscle damage and provide diagnoses to referring physicians. The most common diagnoses include peripheral nerve entrapments such as carpal tunnel syndrome, proximal nerve entrapments such as radiculopathies and plexopathies, and generalized peripheral neuropathies such as diabetic neuropathy.

- The *Neurology Program* provides rehabilitation to clients exhibiting functional deficits of neurogenic origin other than stroke and spinal cord. These include multiple sclerosis, parkinson's disease, amyotrophic lateral sclerosis, muscular dystrophies, cerebral palsy and other palsies, post-polio, encephalopathies, and other neurological conditions and degenerative disorders. Clients are served through an intensive interdisciplinary approach with specialized medical expertise, rehabilitation nursing and the rehabilitation disciplines.

- The *Out-patient and Outreach Service* provides client-centered rehabilitation using a holistic approach. Adults with physical impairments, in particular those with neurological or musculoskeletal problems are served. The aim of the intervention is to achieve and/or maintain the person's optimal level of functioning in the community.

- *Prosthetics, Orthotics and Total Foot Care* services provide adults and children with prescribed devices such as orthopaedic braces (orthoses), specialized seating inserts, artificial limbs (prostheses) and foot care. The team has expertise with a variety of devices to ensure that clients achieve their highest level of function.

- The *Respiratory Rehabilitation Program* supports clients with a variety of problems affecting the respiratory system including Chronic Obstructive Pulmonary Disease (COPD), asthma, emphysema, chronic bronchitis, cystic fibrosis, and restrictive pulmonary syndromes such as thoracic resection and pulmonary fibrosis. The program aims to prevent and treat pulmonary complications, and foster self-management and reduced use of medical resources.

- The *Rehabilitation Engineering Service* uses engineering knowledge and technology to improve the quality and cost effectiveness of rehabilitation. It provides clinical services, is involved in research activities, performs technology assessments and participates in projects related to the commercialization of rehabilitation products.

- The *Spinal Cord Program* provides rehabilitation to clients with either a disabling disease or injury to the spinal cord. It accommodates clients with complex health needs, who may require high technology, intense services, lengthy hospitalization and a high utilization of community resources.

- The *Stroke Program* provides rehabilitation to clients exhibiting signs of disturbance in blood supply to the brain. Clients with other brain injuries which have caused disabilities similar to those occurring following a stroke are also admitted to the program.

- The *Trauma Program* provides rehabilitation using a systems approach to clients who have sustained serious injuries or major trauma in which there is multi-system derangement. This includes clients with some spinal involvement, multiple fractures with or without mild acquired brain injury and complex orthopaedic, surgical and medical cases.

Service Vision

We will strive to be leaders in comprehensive rehabilitation dedicated to improving the health and quality of life of the people we serve and to uphold the values of dignity, collaboration, communication, consumer participation and advocacy.

We will measure our achievements by way of five success factors:

- Create best practice with those we serve
- Nurture people and teams in an outstanding environment
- Cultivate research, education and development
- Optimize outcomes through partnerships
- Acquire and maximize resources

Institute for Rehabilitation Research and Development

The Research Department at TRC officially became the Institute for Rehabilitation Research and Development (IRRD) in 1992. Since that time the researchers and staff of IRRD have pursued the mandate of research and development, promoting networking and partnerships with consumers, universities, industry and others with both enthusiasm and success.

The Institute became Canada's first freestanding research institute for rehabilitation medicine on December 7, 2000. Prime Minister Chrétien and Christopher Reeve were at TRC to launch IRRD as an independently incorporated body within the walls of TRC. As noted on that day by Dr. Jamie MacDougall, Director of Research, this moment "...signifies a growing commitment in our society to advancing medical research and helping people with disabilities achieve full integration and participation in all aspects of life."

IRRD's Mandate

- Coordinate and facilitate the research effort at TRC
- Promote and encourage active consumer involvement in all aspects of research
- Promote research networking and partnerships
- Provide research consultation and project management expertise
- Facilitate commercialization of devices, products and services
- Promote knowledge transfer related to research and education

All aspects of the mandate have seen growth in the past year. The researchers of IRRD have been successful in securing grants from national funding agencies that span all areas of rehabilitation. The links with many academic institutions, particularly the University of Ottawa, have been strengthened. Industry and public sector partnerships continue to flourish as evidenced by much of the body of this report.

The staff and researchers of IRRD look forward to continuing to pursue the mission of seeking new and exciting knowledge across the spectrum of research in rehabilitation, from basic science to clinical outcome trials and population based health outcome studies. We are committed to finding new and innovative methods of delivering this knowledge to the clinician and the consumer.

2001-2002 Primary Investigator List

TRC Investigators

Shelly Bercovitch	Physiotherapy
Lynn Bloom	Social Work
Daniel DeForge	Medicine
Joyce D'Eon	Psychology
Penny Henwood	Nursing
Lynn Hunt	Occupational Therapy
Nathalie Lapierre	Nursing
Edward Lemaire	Bioengineering
Shawn Marshall	Medicine
Anna McCormick	Medicine
Douglas McKim	Medicine
Ann Meltzer	Communication Disorders
Jennifer Nymark	Gait & Motion Analysis Laboratory
June Trevoy	Nursing (no longer at TRC)
Guy Trudel	Medicine
Keith Wilson	Psychology

External Investigators

Lucie Brosseau	University of Ottawa
Harvey Chochinov	University of Manitoba
Barbara de Faye	University of Ottawa
Bruce Dobkin	University of California Los Angeles
Gordon Guyatt	McMaster University
Kam Lun Leung	Hong Kong Polytechnic University
Anthony Newall	Consultant
Sandra Olney	Queen's University
Kerry Rambarran	University of Ottawa
Patricia Roberts	University of Ottawa
Lisa Waldegger	University of Ottawa

Administrative & Support Staff

Sue Balmer	Physiotherapist
Carolynn Cook	Research Associate
Dorothyann Curran	Research Assistant
Jamie MacDougall	Director
Debra Schleyer	Secretary

University of Ottawa Research Associates

IRRD has formal research partnerships with several University of Ottawa faculty members:

Lucie Brosseau	School of Rehabilitation Sciences	Faculty of Health Sciences
Claire-Jehanne Dubouloz	School of Rehabilitation Sciences	Faculty of Health Sciences
Don Hillman	The Centre for International Health & Development	Faculty of Medicine
Elizabeth Hillman	The Centre for International Health & Development	Faculty of Medicine
Mario Lamontagne	School of Human Kinetics	Faculty of Health Sciences
Joan McComas	School of Rehabilitation Sciences	Faculty of Health Sciences
Patricia Roberts	School of Rehabilitation Sciences	Faculty of Health Sciences
Heidi Sveistrup	School of Rehabilitation Sciences	Faculty of Health Sciences
Robert Swenson	Department of Psychiatry	Faculty of Medicine
Rachel Thibeault	School of Rehabilitation Sciences	Faculty of Health Sciences
Louis Tremblay	School of Rehabilitation Sciences	Faculty of Health Sciences

2001-2002 Research and Development Partners

Research Collaborators

- Canadian Paraplegic Association
- Carleton University
- Dr. H. Bliss Murphy Cancer Centre
- Hong Kong Polytechnic University
- Jack Purcell Community Centre
- Kelowna General Hospital
- L'Hotel Dieu de Quebec
- London Health Sciences Centre
- McGill University
- McMaster University
- Orthoactive
- Ortho-Bio-Med
- Ottawa Health Research Institute
- Rehabilitation Network of Ottawa-Carleton
- Queen's University
- Regional Palliative Care Program, Edmonton
- Sisters of Charity of Ottawa Health Service
- Smith Prosthetics
- State University of New York
- The Ottawa Hospital
- Toronto Rehabilitation Institute
- Université de Laval
- University of British Columbia
- University of California, Los Angeles
- University of Manitoba
- University of Ottawa
- University of Ottawa Heart Institute
- University of Ottawa Institute of Palliative Care
- University of Saskatchewan
- University of Toronto

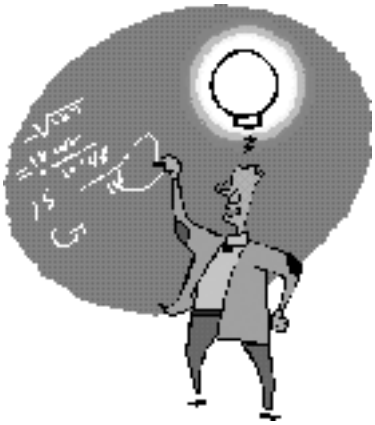
Funding Sources

- American Foundation for Suicide Prevention
- Canadian Institutes of Health Research
- Christopher Reeve Paralysis Foundation
- Fonds de la Recherche en Santé du Québec
- Heart and Stroke Foundation of Ontario
- Labatt 24 Hour Relay
- National Cancer Institute of Canada
- Office of Learning Technologies
- Ontario Ministry of Health and Long Term Care
- Ontario Neurotrauma Foundation
- Ontario Thoracic Society
- Physiotherapy Foundation of Canada
- The Lung Association
- The Physicians' Services Incorporated Foundation
- Transport Canada
- US National Institutes of Health
- War Amputations of Canada

Industry Sponsors

- Allergan Inc.
- AstraZeneca
- GW Pharmaceuticals
- Pfizer
- Sanofi-Synthelabo

RESEARCH PROJECTS



Project Summaries

Access to Primary Health Care Services for SCI Persons: Search for a New Service Delivery Model

Investigator(s):
N. Lapierre — The Rehabilitation Centre
S. Cranmer-Byng — Canadian Paraplegic Association

Purpose: A spinal cord injury (SCI) has an impact on bodily functions and systems well beyond the site of the physical injury. For this reason, persons with SCI often experience a range of acute health problems and chronic conditions, which a general health care practitioner is ill-equipped to deal with. Added to this are the physical limitations of mobility, which can make accessing primary health care facilities and primary health care providers (PHC) difficult. The purpose of this project was to explore the SCI consumer's opinion of a proposed service delivery model consisting of a rehabilitation nurse practitioner providing PHC services via telephone or email. Although similar services are gaining in popularity in the general population, we wished to establish a model that would meet the specific needs of the SCI population.

Description: The primary means of data collection was a telephone survey, which was designed to determine: 1) the experience of the SCI population in terms of availability, barriers and satisfaction with PHC services, 2) the main PHC topics of concern, and 3) the level of interest in a telephone advice/care or email line to facilitate access to PHC.

Results indicate general practitioners were the most frequently consulted health care worker in this sample (92%). This was followed by other physician specialists (68%), nurse practitioners (51%), and rehabilitation physicians (40%). The average number of health issues experienced by SCI persons in this survey during the year was six, with a range of one to 13 issues. Respondents felt that the nurse practitioner was the most consistently knowledgeable health professional in terms of SCI. Despite being the most frequently consulted health care worker, general practitioners were regarded as the least knowledgeable. The most common issues for consultation were bladder (60%), pain (38%), pressure sore problems (31%), spasticity/joint problems (29%), and edema (21%). The majority of respondents felt that most health facilities were accessible to people with spinal cord injuries. However, 75% of those surveyed reported experiencing barriers when attempting to consult community or health care resources. When asked whether they felt a telephone help line would be useful to them in order to consult a health professional, 95% of participants agreed that it would, and 67% indicated that an email help line would be useful.

Impact/Future Plans: The results of this survey clearly indicate that interest in a telephone help line is there on the part of the consumer. Help lines for various other populations (e.g. children, palliative) are becoming more common and have been shown to be successful from both consumer and professional points of view. A health help line manned by a nurse practitioner would fill a gap in health care services to this population. Telehealth protocols developed for an SCI health help line could also be expanded to include other rehabilitation populations. It is proposed that the ideal clinical professional to support the help line would be a nurse practitioner experienced in dealing with rehabilitation issues. A nurse practitioner would have greater freedom to assess, diagnose, plan and prescribe than a registered nurse, but would not be as costly as employing a physician specialist. Given the shortage of physiatrists in Ontario, the development of this role is even more warranted.

Funded by the Ontario Neurotrauma Foundation and the Labatt 24 Hour Relay

A Multi-Centre, Double-Blinded, Placebo-Controlled Flexible Dose Study to Evaluate the Efficacy and Safety of Viagra (Sildenafil) in Women who have Sexual Arousal Disorder Resulting from a Traumatic Spinal Cord Injury

Investigator(s):
D. DeForge — The Rehabilitation Centre
N. Gilbert — The Rehabilitation Centre

Purpose: To evaluate the efficacy, safety and tolerability of oral Viagra taken for 12 weeks, as required, in women with female sexual arousal disorder as a direct result of a traumatic spinal cord injury.

Description: Subjects will participate in the study for 16 weeks in total, including a four-week treatment-free, run-in phase, during which time baseline sexual function data will be collected using event logs. Subjects considered eligible for the study after the run-in phase will enter a 12 week, double-blind parallel-group treatment phase. Each subject will be randomized to receive either Viagra 50mg or matching placebo. The investigator will be allowed to adjust the subject's dose only once during the study, either up to 100mg or down to 25mg. If the dose must be adjusted a second time, the subject will be withdrawn. Should any adverse events be present at the end-of-study visit (week 12), subjects will be asked to return for one or more post-completion follow-ups. The primary efficacy endpoint will be the *change in the proportion of satisfactory sexual activities between the four-week treatment-free run-in period (baseline) and the last four weeks of the on-treatment period.*

Impact/Future Plans: To date, we have screened four clients and randomized three. We have had one screen failure and one client that withdrew from the study at week 4 due to adverse events. Recruitment at all sites has been quite difficult due to the strict inclusion criteria. As a result, Pfizer has prolonged the study period at all sites. We project that the study will continue to run for another few months.

Sponsored by Pfizer

A Pilot Project to Develop Consumer Driven Outcome Measures for the Evaluation of an Acquired Brain Injury Community Integration Program

Investigator(s):

S. Marshall	The Rehabilitation Centre
K. Milne*	The Robin Easey Centre
F. Pelletier*	The Robin Easey Centre
L. Cowin*	The Rehabilitation Centre

Purpose: To develop an outcome measure specific to the evaluation of an ABI community re-integration program.

Description: Focus groups of clients, caregivers and health care professionals were held to discuss concerns and perceived gaps in service. In addition, a literature review was conducted to determine existing outcome measures that would be useful for future program evaluation. Based on the information obtained from the focus groups, a questionnaire was developed to capture the re-integration experience of clients at The Robin Easey Centre.

Impact/Future Plans: A formal program evaluation model will be established with this newly developed outcome measure being the central piece in the evaluation of The Robin Easey Centre services. Future clients will all be asked to fill out the questionnaire before leaving the program. Future modification of services will be influenced by the information obtained from this questionnaire.

Funded by the Ontario Neurotrauma Foundation and the Labatt 24 Hour Relay

A Prospective Study of Mild Traumatic Brain Injury

Investigator(s):

S. Marshall	The Rehabilitation Centre	D. Coyle	Ottawa Health Research Institute
K. Wilson	The Rehabilitation Centre	A. Tellier	The Ottawa Hospital
B. Garber	Ottawa Health Research Institute	I. Stiell	Ottawa Health Research Institute
K. O'Rourke	Ottawa Health Research Institute		

Purpose: Mild traumatic brain injury (mTBI), representing over 80% of all persons with traumatic brain injury (TBI), has been described as the "silent epidemic" of our times. The neuropsychological and physical sequelae following mTBI are generally more subtle than those found with moderate and severe TBI, however, in many instances, these deficits still lead to persistent symptoms and the inability to fully resume premorbid activities and social roles. Since organized programs for management of persons with mTBI do not exist, the true extent and effects of the impact of mTBI on patients, as well as confounding conditions such as depression, pain and post-traumatic stress disorder are not known. The degree to which medical and rehabilitation resources are used by this population also remains unknown.

* no longer at TRC or The Robin Easey Centre

The main objective of this study is to determine how and to what extent mTBI in patients with and without comprehensive insurance coverage impacts their ability to fully reintegrate into pre-injury social and vocation roles. Secondary objectives of the study will be to 1) document a profile of patients with mTBI based on the World Health Organization ICIDH-2, 2) identify and assess the impact of comorbid conditions associated with mTBI including neuropsychological deficits, post-traumatic stress disorder and post-concussional symptoms, and 3) compare rehabilitation resource utilization of mTBI patients with and without comprehensive medical insurance coverage.

Description: Patients with mTBI presenting to the Emergency ward of The Ottawa Hospital will be recruited to participate in this study. At one month post injury, patients will undergo a thorough interview process that will include neuropsychological testing as well as structured clinical interviews to determine presence of depression, post-traumatic stress disorder and substance abuse. Patients will also complete questionnaires including the Community Integration Questionnaire, the Neurobehavioral Functioning Inventory, the Short Form 36, and questions regarding the economic impact of the mTBI. Patients will once again complete this testing at six months post injury and questionnaires will also be sent out at one year post injury. Patients will be identified as belonging to either the comprehensive insurance or no insurance groups. Analysis will be done using propensity scoring techniques which are appropriate for prospective cohort studies where patients are not randomized. Recruitment of patients will occur over one year and 75 patients will be recruited per group.

This study will clarify the role of comprehensive insurance in the outcome following an mTBI, as well as provide information regarding the sequelae of mTBI and possible effective interventions secondary to identifying particular areas of difficulty. This study will also quantify the direct and indirect costs of mTBI to the patient and family.

Impact/Future Plans: The study is currently in its first year and is recruiting patients. The results will determine the morbidity related to mTBI, the difference in services between patients with and without comprehensive insurance, and the direct and indirect costs associated with the management of mTBI.

Funded by the Ontario Neurotrauma Foundation

A Randomized Clinical Trial of a Locomotor Intervention for Patients with Acute Incomplete Spinal Cord Injury

Investigator(s):

B. Dobkin	University of California, Los Angeles	Y. Kossen	The Rehabilitation Centre
D. DeForge	The Rehabilitation Centre	P. Place	The Rehabilitation Centre
J. Nymark	The Rehabilitation Centre	S. Millar	The Rehabilitation Centre
M. Badour	The Rehabilitation Centre	P. Henwood	The Rehabilitation Centre
F. Yazdi	The Rehabilitation Centre	S. Yan	Consultant

Purpose: The US National Institutes of Health have funded this ongoing multi-site randomized controlled trial to evaluate an intervention aimed to enhance walking recovery in people who have suffered a recent, traumatic, incomplete spinal cord injury (iSCI). This intervention aims to increase the number of patients who achieve independent walking overground and enable them to walk at a reasonably fast and energy-efficient pace. This research is led by Dr. B. Dobkin and his team at the University of California, Los Angeles.

Description: The Rehabilitation Centre with the University of Ottawa, and the Montreal Rehabilitation Institute with McGill University are the two Canadian sites participating in this North American trial. Basic animal studies and human clinical research have shown that walking recovery following a traumatic iSCI may be enhanced by an intervention using specific manual stimulation during step training on a treadmill with partial body-weight support using an overhead lift system. Participants are suspended over the treadmill using a climbing harness which is attached to an overhead lift. The amount of weight supported by the lift is manipulated while the physical therapists assist the patient's trunk position and legs in a way that may optimize and stimulate more normal step patterns.

Consenting participants are recruited during the first two months post-onset of injury and are randomized to conventional physical therapy gait training or body-weight supported treadmill step training. Outcome measures include motor and sensory recovery, hypertonicity, walking speed, endurance and independence, Functional Independence Measure score, Short Form - 53, and psycho-social adjustments. The primary outcomes of muscle strength, ambulation status, speed and

endurance are assessed by an evaluator blinded to group assignment. This approach is being tested against conventional therapy with a target number of 200 patients across all sites. Six rehabilitation centres are involved including Rancho Los Amigos in Los Angeles, Ohio State University in Columbus, Shepherd Rehabilitation Centre in Atlanta, Jefferson University and Magee Rehabilitation Hospital in Philadelphia, and the two Canadian sites.

Impact/Future Plans: Subject recruitment is ongoing and will continue into 2002. Final results of this important clinical trial will have a substantial impact on the scientific basis of functional and neurological walking recovery potential in persons with a recent iSCI. We gratefully acknowledge the continued support of The Rehabilitation Centre's physical therapy services, the Institute for Rehabilitation Research and Development, Rehabilitation Engineering Services and volunteers (Jane Craig and Vajid Khan in 2001).

Funded by the US National Institutes of Health

A Safety and Tolerability Study of Medicinal Cannabis Extracts for Chronic Refractory Spasticity and Neurogenic Pain

Investigator(s):

D. DeForge	The Rehabilitation Centre
M. Freedman	Ottawa Health Research Institute
J. Blackmer	The Rehabilitation Centre

Purpose: The purpose of this phase 2 clinical trial is to assess the safety and tolerability of cannabis based medicine extracts (CMBEs) in subjects with multiple sclerosis (MS) or spinal cord injury (SCI), and make a provisional assessment of efficacy in relief of chronic refractory spasticity and neurogenic pain. This is the first clinical trail in North America using medicinal cannabis.

Description: This single centre double blind crossover study will assess the safety, tolerability and efficacy of a single dose of three formulations of CBMEs in comparison to placebo. The study population includes both male and females aged 18 years or older that have either MS or SCI with chronic refractory spasticity and/or neurogenic pain.

The subjects will complete two consecutive periods, each of four weeks duration. In each week, the subjects will receive a single dose on two consecutive days of each of four treatments, with the remainder of the week as washout period. The sequence of administration will be randomized and balanced with a different sequence for each period. There are a total of 18 visits which include pre and post screening. Each visit takes about 6½ hours.

The study medication and matching placebo is administered in a sublingual spray. Each patient is given four dose increments at 0, 15, 60 and 120 minutes. Thus the maximum daily dose allowed is 10mg (2.5mg/spray). If there are any untoward effects during the dosing sequence, subsequent doses can be withheld. The placebo is prepared to match the active formulations as closely as possible in terms of appearance, smell and taste, but contains no active ingredients.

Study assessments include subjective symptom and visual analogue scales (VAS), objective overall status VAS, subjective well-being VAS, ashworth scale, memory and cognitive tests, dose associated symptom relief and psychoactive effect verbal rating scales, clinical laboratory tests and ECG. Each morning subjects have to undergo a Breathalyzer test and drugs of abuse screening. Throughout the testing period subjects are monitored using a cardiac monitor.

Impact/Future Plans: The study is ongoing and will be completed in June 2002. It has been extremely difficult to recruit subjects, mainly because of the very strict inclusion and exclusion criteria, which necessitated several amendments. In addition, the study is very long and time consuming for the subjects. Our projected number of subjects was six to eight and to date, eight subjects have been entered into the study. Of these, one subject was withdrawn secondarily to an adverse event, another subject withdrew consent after completion of visit 5, and a third subject withdrew consent after 11 visits due to excessive pain. Three subjects have completed all study visits and procedures and two are currently enrolled in the study and are likely to complete it.

Sponsored by GW Pharmaceuticals

A Validity Based Evaluation of the Driving Assessment Program for Stroke Patients

Investigator(s):

L. Hunt	The Rehabilitation Centre
P. O'Neill	The Rehabilitation Centre
R. Blair	Sisters of Charity of Ottawa Health Service
D. Harper	Sisters of Charity of Ottawa Health Service
P. Pepin	The Rehabilitation Centre

Purpose: TRC has developed a standardized procedure for assessing the suitability of patients to resume driving after stroke. A clear "gold standard" for such assessment, based on cognitive and behavioural performance, has emerged from the professional and research literature. This Cognitive Behavioural Driver's Inventory (CBDI) provides a possible alternative procedure to be used at TRC. The present study, using both concurrent and predictive validity approaches, is designed to answer the question of whether the currently employed technique is as good as or superior to the CBDI in predicting "pass" or "failure to pass" on a standardized on-road driving test. In addition, each assessment procedure will be costed to determine which is more cost effective.

Description: An interrater reliability study was undertaken to ensure that TRC procedures could be reliably administered by two different rehabilitation clinicians. Results indicated that the interrater reliability was extremely high and statistically significant. Having established good interrater reliability, data collection for the research subjects has commenced. To date, completed data sets for 57 subjects have been collected.

Impact/Future Plans: Data collection, although slower than originally anticipated, will continue until full data sets for 60 subjects have been collected. Statistical and descriptive analyses of the data will then proceed, followed by publication of the results. The outcome of this study will help TRC staff choose the better driving assessment technique for post-stroke patients.

Funded by Transport Canada and the Labatt 24 Hour Relay

Canadian National Palliative Care Survey

Investigator(s):

K. Wilson	The Rehabilitation Centre	P. Gagnon	L'Hotel Dieu de Quebec
H. Chochinov	University of Manitoba	D. Kuhl	University of British Columbia
I. Graham	Ottawa Health Research Institute	F. O'Shea	Dr. H. Bliss Murphy Cancer Centre
P. Allard	University of Ottawa	K. Macmillan	Regional Palliative Care Program, Edmonton
S. Chary	University of Saskatchewan	J. Clinch	Ottawa Health Research Institute
M. De Luca	Kelowna General Hospital		

Purpose: To examine issues related to quality of life among people who are receiving palliative care for advanced cancer, and to investigate their attitudes toward voluntary euthanasia and physician-assisted suicide.

Description: In this multi-centre study, 400 patients who are nearing the ends of their lives will undergo in-depth semi-structured interviews administered by clinicians. A range of issues related to quality of life will be assessed, including physical symptoms, social concerns, existential and personal issues, and mental health problems. Participants will also be asked about their views on the controversial end-of-life practices of euthanasia and assisted suicide, including whether, if these practices were legal in Canada, they might ask to end their own lives in this way.

Impact/Future Plans: To date, over 200 participants have been interviewed. These data will provide an important source of information regarding the prevalence and correlates of specific quality-of-life concerns, and offer evidence to the social policy debate around the legalization of euthanasia and physician-assisted suicide.

Funded by the Canadian Institutes of Health Research

Chronic Neuropathic Pain in Spinal Cord Injury: The Patient's Perspective

Investigator(s):

P. Henwood The Rehabilitation Centre

Purpose: Chronic neuropathic pain (CNP) in spinal cord injury (SCI) is recognized as a problem that severely compromises both adjustment after injury and quality of life. Studies report that chronic pain in SCI is associated with great emotional distress over and above that of the SCI itself. The purpose of this study was to examine the impact of CNP through the experience of SCI persons considering physical, cognitive, affective, behavioural, and socio-environmental domains of functioning.

Description: In the fall of 2000, three focus groups were conducted at The Rehabilitation Centre. Participants included 18 SCI men and six SCI women who had CNP and whose ages ranged from 32-60 and 31-69, respectively. Years since the onset of the SCI ranged from one to 30. There was widespread representation of neurologic level and extent of spinal cord involvement.

Participants commonly viewed their SCI as a minor issue in comparison to their difficulty in coping with CNP. It was apparent that all of these participants experienced significant physical pain which impacted their ability to live fully functioning and rewarding lives. Several physical factors contributed to increased pain, most prominently, fatigue and spasticity. The physical, emotional and cognitive energy required to cope with their pain, coupled with severe sleep disturbance, resulted in greater difficulties in coping. Spasticity exacerbated the pain and contributed to further sleep deprivation.

Participants experienced a wide range of negative emotions and cognitions that resulted in increased pain. Catastrophizing cognitions, negative appraisals of pain and helplessness beliefs also seemed to be associated with pain severity, interference with life activities and greater disability. Interpersonal relationships were also impacted by the pain. Familial stresses were noted in several cases. Others expressed concerns of burdening their partner and made efforts to balance their dependency needs with the needs of their partner. In addition, the inability to cope with the pain led to decreased social interaction.

Participants employed a wide range of coping strategies to manage their pain. Swimming in warm water was found to be equally beneficial for both paraplegics and quadriplegics. Massage, physical activity, and position change were the next most effective strategies. While prescribed medications were generally ineffective over the long term, SCI individuals participated in self-medicating practices involving prescription and over-the-counter medications, as well as alcohol and marijuana.

Impact/Future Plans: The findings of this pilot project demonstrate that some SCI persons do learn to live with CNP. The notion of 'acceptance of pain', as described in the chronic pain literature, appears similar to statements made by participants in this study. Future research will focus on developing a theoretical framework to explain the process of acceptance as it relates to CNP in SCI.

Completed as part of a directed study in a graduate program.

Community Access to Rehabilitation Education

Investigator(s):

E. Lemaire The Rehabilitation Centre
G. Greene The Rehabilitation Centre

Purpose: Continuous learning is an important part of our healthcare system, however, Canadian geography often limits access to quality education. This is especially true for specialized physical rehabilitation since expertise is concentrated in regional centres. Healthcare providers in smaller communities often handle complicated rehabilitation cases; such as, spinal cord injuries, strokes, and amputations. Rural healthcare professionals must develop the experience to meet these special needs. An ideal scenario would allow clinicians in rural communities to access physical rehabilitation education at the right time, the right place, and the right cost. This project examined how communication and multimedia learning technologies can be used to attain these goals.

Description: Our technological model involved a Write-Once Publish-Everywhere approach for creating and delivering educational content. Since many aspects of physical rehabilitation rely on vision and touch, multimedia content is needed to convey the necessary information. For this initiative, video-based multimedia content was captured using user-friendly, consumer level software and hardware. The audio/video/text data were integrated into office suite presentation software (Corel Presentations, Microsoft PowerPoint).

To maintain the Write-Once Publish-Everywhere objective, text was written such that the modules could "stand on their own" as an on-line reference but still be useful as an on-site presentation. Presentation software was used to create handouts, slides, overheads, CD-ROM, web pages, streaming media, Internet-based video conferencing whiteboard pages, and output for a laptop computer projector. Twenty-five modules were produced by Ontario rehabilitation specialists and are available at www.rehab.on.ca/mobile/present_e.html.

Questionnaire and consumer forum evaluations of the various media supported the Write-Once Publish-Everywhere approach for continuing education. Almost all respondents gave above average ratings for the module format, content, and the learning experience. The Write-Once Publish-Everywhere modules were expected to have a positive influence on the participant's work. While the project team initially thought that study participants would prefer certain media approaches, all forum participants insisted on access to all media formats. Each format had advantages from a level of interaction or ease of access perspective. Even paper copies of the modules were considered valuable since they could be organized in a "learning binder" that could be easily accessed by staff.

Low-bandwidth desktop video conferencing sessions (33-56 Kbps modem) were effective, provided that sites connected 15-20 minutes early for Whiteboard pre-loading. The Write-Once Publish-Everywhere approach was useful for dealing with low-bandwidth situations. For example, if the Internet connection was too slow for live video conferencing the content was viewed from the web site or the CD-ROM (telephone used for audio).

Impact/Future Plans: The strong endorsement of the Write-Once Publish-Everywhere modules supports implementation of this approach for developing and disseminating continuing education content throughout the physical rehabilitation field.

While the project has been completed, the Write-Once Publish-Everywhere model will continue to be used to provide continuing education related to physical rehabilitation. New communication technologies are being investigated as Write-Once Publish-Everywhere modalities.

Funded by the Office of Learning Technologies and the Labatt 24 Hour Relay

Decision Making in Amyotrophic Lateral Sclerosis (ALS): Ventilation Education

Investigator(s):
D. McKim The Rehabilitation Centre

Purpose: To evaluate the impact of a hands-on education program discussing mechanical ventilation for patients with ALS. Outcomes of interest include knowledge of mechanical ventilation, anxiety and decision making.

Description: Patients and caregivers each complete a questionnaire with components of ventilation knowledge and decision making and, in the patient's case, a positive and negative affect scale. Questionnaires are given at four time points; one week before the education session, just before the education session, immediately after the session and one month following the session.

Impact/Future Plans: Almost all the planned patients have been recruited. This type of session appears to be very useful to patients with ALS as 92% of patients felt that the education session was helping them make a decision about preferred treatment and 100% indicated that the information session was 'just right' in terms of length. There was no negative affect associated with the education session, and the number of ventilation choices was narrowed as a result of the education. Knowledge of ventilation significantly increased after the session and was maintained at followup. It is hoped that the education session will ultimately have a positive impact on families who must make difficult decisions about ventilation care.

Funded by the Ontario Thoracic Society

Design and Testing of a Stance-Phase Control Knee Joint for Lower Extremity Orthotics

Investigator(s):

E. Lemaire	The Rehabilitation Centre
R. Harrison	Carleton University
Y. Jeffreys	Orthoactive
L. Goudreau	The Rehabilitation Centre

Purpose: People who use knee-ankle-foot orthoses (KAFO) are forced to walk with a locked knee joint (i.e., the leg is locked straight), however, many people have enough strength and control to walk with a free moving knee joint. Unfortunately, these clients also have a high probability of falling and seriously injuring themselves. A KAFO knee joint that unlocks to let the knee bend during swing, and locks during stance, would be an ideal solution for these clients.

Description: This project involves designing and testing a stance-phase control knee joint for KAFOs. The electro-mechanical joint will take advantage of new mechanical knee joint technology and will add pressure sensors, controlling circuitry, and an unlocking mechanism to allow free motion at the knee during swing, but knee locking during stance. After testing three knee joint prototypes, the high loads on the joint resulted in excessive material deformation. Knee joint re-design is in progress. Our Gait and Motion Analysis Laboratory facilities have been adapted for remote control of the joint during testing.

Impact/Future Plans: Once a prototype has been designed, the new KAFO will be evaluated using quantitative motion analysis, client satisfaction questionnaires, and clinician questionnaires. For the new knee joint to be considered a success, walking gait must be more symmetrical and exhibit closer to normal gait patterns than a locked-knee KAFO. Client and clinician satisfaction scores must be better than similar scores from the client's current KAFO.

Development and Pilot Testing of a Measurement-Based CAD/CAM System for Fitting People with New Trans-tibial Amputations

Investigator(s):

E. Lemaire	The Rehabilitation Centre
J. Fawcett	The Rehabilitation Centre
D. Nielen	The Rehabilitation Centre
W. Kaphingst	Ortho-Bio-Med

Purpose: Computer Aided Design (CAD/CAM) is an efficient and consistent way of making a prosthetic socket. The easiest way of defining a socket shape is to take a series of measurements that the CAD system can use to calculate an appropriate socket shape. The prosthetist can then use the CAD software to customize this shape for the client. While this system has been effective for trans-femoral (TF) prosthetic socket design, less success has been achieved for mature trans-tibial (TT) sockets.

Description: In theory, a measurement-based CAD/CAM system could work well for new amputees since the typical residual limb has a more bulbous shape. A prosthetist will also try to influence the changes in limb shape over the first months by introducing an appropriate socket. A measurement-based system should accomplish this reshaping task in a more efficient and consistent manner. Information on socket fit, modifications, manufacturing times, and clinician satisfaction have been collected and will be used to assess the feasibility of this design/manufacturing approach.

Impact/Future Plans: The project is currently being re-evaluated to take advantage of new measurement-based CAD/CAM technology. In addition, new partnerships are being explored to create a more intimate fitting socket, while taking advantage of the time savings from measurement-based CAD/CAM.

Funded by the Labatt 24 Hour Relay

Development and Validation of the Physical Impairment Questionnaire

Investigator(s):

S. Marshall	The Rehabilitation Centre	K. O'Rourke	Ottawa Health Research Institute
B. Garber	Ottawa Health Research Institute	P. Hebert	Ottawa Health Research Institute
M. Girrotti	London Health Sciences Centre	J. Yelle	The Ottawa Hospital
D. Gray	London Health Sciences Centre	G. Pagliarello	The Ottawa Hospital
K. Wilson	The Rehabilitation Centre		

Purpose: The purpose of the project is to develop and validate a questionnaire that can measure impairment for patients who have suffered multi-systems trauma.

Description: The project first developed the Physical Impairment Questionnaire based on the "Guides to the Evaluation of Permanent Impairment (4th edition)", published by the American Medical Association. This questionnaire indicates the body systems that are impaired for a patient following trauma and provide a summary score percentage of whole person impairment.

For the validation component of this project, a convenience sample of patients who had been previously admitted to a major trauma centre (The Ottawa Hospital or London Health Sciences Centre) were examined by two physicians and the results of the physical examination were compared to the questionnaire to determine the validity and reliability of the questionnaire. To date we have completed both the development of the questionnaire and patient recruitment (n=43). Analysis of the data is now being coducted.

Impact/Future Plans: This questionnaire, when validated, will provide an estimate of impairment for patients who have suffered multi-systems trauma. Impairment remains an important element of overall health and health related quality of life and this instrument will be of assistance in future studies to estimate the extent of existing impairment for persons with multiple systems impairments.

Funded by The Physicians' Services Incorporated Foundation and the Labatt 24 Hour Relay

Development of a Pain History Questionnaire and Database

Investigator(s):

J. D'Eon	The Rehabilitation Centre
E. Petersen	The Rehabilitation Centre
K. Wilson	The Rehabilitation Centre
H. Baldwin	The Rehabilitation Centre

Purpose: This project involves the development and evaluation of a comprehensive Pain History Questionnaire and a corresponding coding system to record and summarize questionnaire responses.

Description: The Pain History Questionnaire was developed to facilitate the clinical assessment of individuals with pain by providing consistent and comprehensive background information prior to their assessment. Questionnaire responses are available to all treating clinicians in order to minimize patient repetition and to ensure that team members have the same information. Diverse input was sought in the development of the questionnaire and included members of the Chronic Pain Rehabilitation Service, consumer representatives and patients. The measure was pilot-tested and modified on four occasions over a three-year period. Interrater reliability in coding the information has been examined and a coding manual for the questionnaire has been developed and revised. Currently 200 patients have completed the questionnaire and the validity of the questionnaire will be examined in relation to other measures. The reliability of the questionnaire will be determined with 50 patients who have completed the questionnaire a second time. Data collection will be completed in the next few months.

Impact/Future Plans: This project is designed to facilitate the clinical assessment of people with pain by documenting patients' pain history through a comprehensive, valid, and reliable questionnaire. The coding manual will enable the collection of consistent information to facilitate treatment planning and program evaluation within and across programs working with individuals with chronic pain.

Dignity Psychotherapy: An Intervention for Suffering in the Terminally Ill

Investigator(s):

H. Chochinov	University of Manitoba
K. Wilson	The Rehabilitation Centre

Purpose: To conduct a preliminary investigation of the efficacy and process of a new psychological treatment – Dignity Psychotherapy – with patients whose dignity is diminished by life-threatening illness.

Description: The preservation of dignity is a core value of The Rehabilitation Centre, and of health care generally, but it is a little-studied construct from an empirical perspective. The symptoms, losses and psychosocial strains that accompany advancing illness can diminish one's sense of dignity, but we have little appreciation of what can be done about it. In this study, a new form of psychotherapy has been developed around the construct of dignity, as it has been described in research with people who are dying of cancer. In this study, the therapy is being evaluated using a pre-test/post-test design with patients who are facing declining health because of amyotrophic lateral sclerosis (ALS). We anticipate that about 20 patients will take part over the course of the next 12 months. The therapy comprises a life review, a summing up of important lessons learned, and messages to loved ones. A written product, called a "legacy document," is created through the interview process, and provides a lasting keepsake for the family.

Impact/Future Plans: Little empirical research is available about how to enhance the dignity, and reduce the existential suffering, of people with life-threatening illness. Dignity Psychotherapy is an attempt to develop a new avenue of research into this neglected topic.

Funded by the American Foundation for Suicide Prevention

Enhancement of Prosthetics and Orthotics Learning and Teaching Through the State-of-the-Art Teaching Technology and Appropriate Methodology

Investigator(s):

K. Leung	Hong Kong Polytechnic University
E. Lemaire	The Rehabilitation Centre
M. Wong	Hong Kong Polytechnic University

Purpose: In terms of physical rehabilitation, most prosthetic and orthotic education sessions are delivered in laboratory and clinical settings since much of the content is hands-on in nature (e.g., adjustment of prosthetic alignment, testing of joint range of motion and assessment of muscle strength). This project sought to demonstrate how multimedia education technology can be employed to successfully deliver this information.

Description: A Write-Once Publish-Everywhere model was used to create and deliver educational content. Video-based multimedia content was captured and integrated with graphic, audio, and text into a presentation software format. The software was used to create handouts, slides, overheads, output for a laptop computer projector, CD-ROM, and web sites. Upper extremity orthotics modules have been completed and integrated into the Hong Kong Polytechnic University Prosthetics and Orthotics program. Video editing continues for production of other modules. Evaluation continues with the current students.

Impact/Future Plans: Evaluation of the project and data analysis are in progress.

Funded by the Labatt 24 Hour Relay

Establishment of a Program Evaluation Model for the Robin Easey Centre

Investigator(s):

S. Marshall	The Rehabilitation Centre
F. Pelletier*	The Robin Easey Centre
L. Cowin*	The Rehabilitation Centre

Purpose: To create a program evaluation model specific to a community re-integration program for ABI clients.

* no longer at TRC or The Robin Easey Centre

Description: This is the second phase of a two-part project and is based on data collected from focus groups and a literature review performed in the first phase. The consumer-driven satisfaction measure, which was developed in the first phase, was combined with several other valid and reliable tools to make a program evaluation package. The tools are specifically designed to asses client re-integration into the community and include measures of functional daily living, community integration and general health. This package was sent to as many previous clients as possible (those with reliable addresses) and followup phone calls ensured a high return rate. Data analyses will be performed to determine the characteristics of the population being served by the facility and to assess the suitability of the measures for ABI assessments. Factor analysis will also be done to determine the dimensions being measured by the newly developed satisfaction measure.

Impact/Future Plans: Data will be analyzed for gaps in service and to identify particular areas of client interest. Services and programs will be assessed and appropriate revisions made based on the feedback obtained from this extensive evaluation. Future clients will continue to be assessed with measures found most useful in this evaluation. Information will be collected prospectively in a computer database. Based on the results of this project a formal program evaluation system will be established at The Robin Easey Centre by completion of the project. Ultimately, it is hoped that this process will serve as a template for other health care centres in the development and implementation of program evaluation for ABI.

Funded by the Ontario Neurotrauma Foundation

Exploring 'Acceptance of Chronic Neuropathic Pain' in Spinal Cord Injured Persons

Investigator(s):
P. Henwood The Rehabilitation Centre

Purpose: Persistent nerve pain known as chronic neuropathic pain (CNP) is a significant problem in spinal cord injury (SCI). This medical condition has physical, functional and psychosocial repercussions beyond the consequences of the SCI itself. It is estimated that approximately 23,400 SCI persons are currently living with CNP in Canada. The early onset, the tendency of increasing severity of CNP over time, and the relative lack of effective treatment options contribute to further disability that negatively impacts the rehabilitative process and adaptation to the SCI. Given that SCI often occurs at an early age, and the life expectancy of SCI persons approximates that of the general population, SCI persons may expect to live with CNP for a very long time. When efforts to control the pain have proven fruitless, SCI persons are often told that they will need to learn to live with the pain. An apparent gap exists, however, in our understanding of the process of acceptance of CNP. Research findings indicate that persons with chronic low back pain who have accepted that their pain is permanent are more likely to say that they have less severe pain, less depression, anxiety, and physical disability and a greater ability to work and enjoy life than those who do not accept their pain, regardless of pain severity. Acceptance of CNP may be adaptive for SCI persons when relief from pain is unattainable. Although acceptance has been explored in relation to chronic pain of a musculoskeletal origin, little is known about the process of acceptance as it relates to SCI persons having CNP. The purpose of this study is to gain an understanding of the process by which SCI persons learn to live with CNP.

Description: A qualitative approach known as grounded theory will facilitate the emergence of a theory that will explain the complex social and psychological process of acceptance of CNP in SCI. The sample for this study consists of 20 community-living SCI persons with CNP who are 18 years of age or older, and are currently receiving, or have previously received, treatment at The Rehabilitation Centre in Ottawa. Participants will take part in an interview where they will be asked questions about their experience with chronic pain, the ways in which they have learned to live with their pain, and how they feel about their pain now as compared to when it started. The interviews will be tape-recorded in order to accurately record and analyze the data. Demographic data will be obtained from each participant and/or their hospital chart. Feedback will be sought from the participants to verify the accuracy and comprehensiveness of the theory in terms of its explanatory power.

Impact/Future Plans: A conceptual framework of the process of acceptance of CNP in SCI is fundamental to the development of clinically relevant interventions that can assist other SCI individuals in learning to live with pain when pain relief is unattainable. This study will lay the groundwork for the development of pain management interventions that will potentially benefit SCI persons as they endeavor to learn to live with CNP.

Graduate thesis funded by the Labatt 24 Hour Relay

Gait Recovery Patterns of Incomplete Spinal Cord Injured Persons: Supplementary Analysis for a Multi-Site North American Clinical Trial

Investigator(s):

J. Nymark	The Rehabilitation Centre
D. DeForge	The Rehabilitation Centre
E. Lemaire	The Rehabilitation Centre
H. Barbeau	McGill University
S. Millar	The Rehabilitation Centre
F. Yazdi	The Rehabilitation Centre

Purpose: The purpose of this pilot gait analysis study was to quantify both static and dynamic changes of muscle control, hypertonicity and limb motion during a body weight-supported treadmill (BWST) stepping program.

Description: Two subjects participated in this preliminary study. Both subjects had sustained a traumatic incomplete spinal cord injury within two months of admission to the training regime. The two individuals were non-ambulatory at the time of the first evaluation on the BWST assisted-stepping. Evaluations were performed in the early (pre) and later (post) stages of the training program. Static measures included muscle strength as determined by a hand-held dynamometer, muscle tone as estimated by the modified Ashworth scale, and the pendulum test. The dynamic measures included surface electromyography of the superficial muscles of the lower limb, electrogoniometry of the hips, knees and ankles, and timing of steps using footswitches.

Preliminary results indicated that static and dynamic measures were in agreement with respect to the coexistence of hypertonicity and muscle weakness. Predominant weakness was evident in both subjects in the ankle plantar and dorsiflexors with less clear delineation in the more proximal muscles. The dynamic gait analysis also discriminated between premature timing and weakness of ankle plantar flexor muscle action in the stance phase of gait.

Impact/Future Plans: This pilot work was a supplementary evaluation of this site's role in a multi-centre randomized clinical trial on a treadmill locomotor training program. Further analysis of overground walking analysis of the two subjects will identify the key factors of overground capacity and their relationship with weight supported treadmill walking and normative data. Communication of results is planned for 2002 in collaboration with H. Barbeau at McGill University. A preliminary observation is that future work in gait analysis is recommended to include measures of trunk control and balance.

Funded by the Christopher Reeve Paralysis Foundation

Gender Differences in Preferences Regarding Intubation and Mechanical Ventilation in Patients with Severe Chronic Obstructive Pulmonary Disease

Investigator(s):

K. Wilson	The Rehabilitation Centre	E. Sevigny	The Rehabilitation Centre
S. Aaron	Ottawa Health Research Institute	K. Vandemheen	Ottawa Health Research Institute
P. Hebert	Ottawa Health Research Institute	A. O'Connor	Ottawa Health Research Institute
D. McKim	The Rehabilitation Centre		

Purpose: To evaluate a decision aid that is intended to help people with severe chronic obstructive pulmonary disease (COPD) determine whether they would choose mechanical ventilation with supportive care over supportive care only in the event of a life-threatening respiratory crisis.

Description: A total of 33 participants with severe COPD were recruited from the respiratory rehabilitation program of The Rehabilitation Centre. Each participant completed an audiotape-assisted decision aid booklet that described the choices of mechanical ventilation versus supportive care only (which would result in death). Most participants (94%) believed that the decision aid helped them to plan for a preferred option if they faced such a respiratory emergency. The majority (74%) believed that they would not choose mechanical ventilation, apparently viewing it as a highly intrusive intervention with a low probability of a successful long-term outcome. Qualitative data from tape-recorded exit interviews will be analyzed to further identify the reasons underlying these preferences.

Impact/Future Plans: Decisions about mechanical ventilation are often made in the emergency room under crisis conditions. A valid decision aid will help patients with COPD to participate in planning for respiratory crises, and formulate advance directives for scenarios of life-threatening exacerbations.

Funded by the Labatt 24 Hour Relay

Gender Invariance and the Multidimensional Pain Inventory

Investigator(s):
J. D'Eon — The Rehabilitation Centre
C. Harris — University of Ottawa

Purpose: This psychometric study examines the suitability of the Multidimensional Pain Inventory for both men and women with chronic pain.

Description: The West Haven-Yale Multidimensional Pain Inventory (MPI; Kerns, Turk, & Rudy, 1985) is a self-report measure that was developed to assess various aspects of the chronic pain experience. The MPI has become one of the most commonly used measures in chronic pain assessment. Previous research conducted at this Centre has established the utility of including the MPI in an assessment battery designed to capture the multifaceted nature of chronic pain. While acknowledging the strengths of this measure, recent research has raised questions about the psychometric properties of some subscales of the MPI. The measure was originally developed using a small sample that was predominantly male. Since its initial development several investigators have reported significant correlations between gender and specific MPI subscales. Since the MPI is such a widely used measure in clinical practice, and chronic pain affects both men and women, it is important to establish the applicability of this measure to both men and women. Confirmatory factor analysis will be used to examine gender invariance of the MPI. The primary goal of the present study is to determine if the factor structure of the MPI is equivalent across gender and to develop gender-specific models and corresponding normative data if it is not. Data collection for the male sample is ongoing, and almost complete for the female sample.

Impact/Future Plans: Results of this study will substantiate the current version of the MPI for both men and women or lead to modifications to identified subscales to improve the application of the inventory in the assessment of individuals with chronic pain.

Graduate thesis funded by the Labatt 24 Hour Relay

Individual Differences in Stress and Coping at the End of Life

Investigator(s):
B. De Faye — University of Ottawa
K. Wilson — The Rehabilitation Centre
R. Viola — University of Ottawa Institute of Palliative Care
S. Chater — University of Ottawa Institute of Palliative Care
J. Seely — University of Ottawa Institute of Palliative Care
P. Hall — University of Ottawa Institute of Palliative Care

Purpose: To examine the sources of physical, social, and existential stress among people who are receiving palliative care, and to investigate how they cope with these stressors.

Description: For people with terminal illness, the months preceding death can be the most stressful of the entire lifespan. In this study, 52 patients who were receiving palliative care for advanced cancer were asked to indicate their most significant stressors within social, physical, and existential domains. A structured interview was then conducted to identify how the participants cope with these stressors. Overall, stressor severity ratings were correlated significantly across the three domains, but patterns of coping differed reliably among them; physical and social stressors led to a greater use of problem-focussed strategies, and social and existential concerns led to a greater use of emotion-focussed strategies. Physical symptoms were rated as the most severe sources of stress, but existential concerns appeared to have the strongest association with measures of depression. However, there was no evidence that depression was related to any specific pattern of coping behaviour.

Impact/Future Plans: People cope quite differently with different aspects of an illness experience, depending on whether the specific stressors are within the social, physical, or existential domains. From a mental health perspective, however, there may be no "best" way to cope with the reality of one's impending death.

Graduate thesis funded by the National Cancer Institute of Canada

Local Corticosteroid Injection for Carpal Tunnel Syndrome: A Systematic Review

Investigator(s):

S. Marshall	The Rehabilitation Centre
G. Tardif	Toronto Rehabilitation Institute
N. Ashworth	University of Saskatchewan

Purpose: To evaluate the effectiveness of local steroid injection for carpal tunnel syndrome versus placebo injection or other non-surgical intervetions in improving clinical outcome, and to determine the length of symptom relief post injection.

Description: We searched the Cochrane Neuromuscular Disease group register, MEDLINE, EMBASE and CINAHL. Studies using either a randomized or quasi-randomized methodology were eligible for inclusion. The studies included participants with the diagnosis of carpal tunnel syndrome and the treatment intervention was local corticosteroid injection. The primary outcome measure was clinical improvement after injection.

Three reviewers independently selected the trials to be included in the study. Studies were rated for their overall quality independently by the reviewers. Studies were compared for heterogeneity using the chi square statistic. Relative risks and 95% confidence intervals were calculated for each trial and summary relative risks and 95% confidence intervals were also calculated.

We identified four randomized controlled trials studying local corticosteroid injection for the treatment of CTS. Two of the trials were excluded since one did not include clinical assessment as an outcome and the other provided only statistical values with no patient outcomes. Each of the remaining two trials had demonstrated clinical improvement of CTS at one month following local corticosteroid injection compared to placebo injection. The pooled relative risk (RR) favouring treatment was 3.62 (95% confidence interval 1.94 to 6.73).

Impact/Future Plans: Local corticosteroid injection for CTS provides greater clinical improvement in symptoms one month after injection compared to placebo. Symptom relief beyond one month compared to placebo has not been demonstrated. The effectiveness of local corticosteroid injection has not been compared to other non-surgical or surgical interventions for CTS in randomized controlled trials. This systematic review and meta-analysis will require an update in June 2002.

Funded by the Labatt 24 Hour Relay

Internet-Based Telehealth for Remote C-Leg Configuration

Investigator(s):

E. Lemaire	The Rehabilitation Centre
J. Fawcett	The Rehabilitation Centre
D. Nielen	The Rehabilitation Centre
C. Smith	Smith Prosthetics

Purpose: The purpose of this study is two-fold: 1) to validate a method for remotely configuring the Otto Bock C-Leg using Internet-based, consumer level telehealth technology, and 2) to verify the necessary bandwidth for reliable information transmission.

Description: Internet-based telehealth technology has continued to evolve over the past ten years. Initial work at The Rehabilitation Centre has demonstrated the capability of consumer-level telehealth technology for resolving physical rehabilitation issues. As telehealth technology has evolved, so has prosthetic technology. A prime example of this is the Otto Bock C-Leg. As listed on the Otto Bock web site, the Otto Bock 3C100 C-Leg System represents the first and only fully microprocessor-controlled swing and stance hydraulic knee.

This project integrates our consumer-level, Internet-based, telehealth system with the C-Leg control software to allow prosthetists with expertise in C-Leg fitting to remotely configure the hardware and consult with the client and their prosthetist. Initial clinical tests with this approach have been promising. This research trial is necessary to verify the clinical outcomes of remote C-Leg configurations. A series of clients will connect with a specialist over the Internet telehealth link, have their C-Leg settings reset to the factory defaults, and the specialist will then attempt to remotely reconfigure the device. A successful trial will be defined by a match between the telehealth settings and the initial settings.

Impact/Future Plans: Community Internet access is being tested and clinician assessment equalization is in progress. Subject testing is planned for May 2002.

Funded by War Amputations of Canada

Long-Term Safety and Tolerability Study of SR57746A in Patients with Amyotrophic Lateral Sclerosis (ALS)

Investigator(s):

A. Newall	Consultant
D. Jackson	The Rehabilitation Centre
K. Walker	The Rehabilitation Centre
U. Buenger	The Rehabilitation Centre

Purpose: This research is part of a phase-4 study of an investigational new drug - xaliproden - which from early trials was known to have potent neuroprotective properties. This open-label trial, involves 54 ALS research centres in Europe and North America. Subjects who have completed a full term in previous efficacy and long-term studies of this drug are being assessed for drug safety and tolerability at regular intervals over a longer period of time.

Description: Between May and October 1999, all 11 subjects who reached month-18 of the initial efficacy study at our site decided to enroll in this long-term trial. As of March 2002, four of the 11 have died of ALS-related complications and two others withdrew from the study. The remaining five subjects continue to take xaliproden, and are clinically monitored by us at regular intervals.

Impact/Future Plans: Although the results from the initial efficacy trial were not as positive as had been hoped, further studies have been recommended and all patients who are currently enrolled in this study will continue to receive xaliproden and be followed up with regular clinical rechecks in this open-ended study.

Sponsored by Sanofi-Synthelabo

Measurement Issues in the Assessment of Quality of Life in Chronic Pain Patients

Investigator(s):

J. D'Eon	The Rehabilitation Centre
K. Wilson	The Rehabilitation Centre

Purpose: This project is designed to determine which of three quality of life measures, each developed from different conceptual frameworks, is most appropriate for use with chronic pain patients.

Description: Concern about the impact of chronic pain on individuals, their families and society, coincides with an international focus on quality of life (QOL) that has been termed the "quality revolution". Both pain and QOL are complex subjective experiences, and consequently definition and measurement become paramount in both areas. While rehabilitation programs for individuals with chronic pain are designed to improve QOL, there are many instruments and little research on the best way to assess QOL in this group. The World Health Organization views QOL broadly and has developed a comprehensive self-report measure (the QOL-BREF). Other investigators have focused on those aspects of functioning most related to health. It is within this framework that chronic pain has been examined most frequently (typically with the SF-36 health survey). Another approach to QOL measurement involves subjective well-being, defined as the degree to which important needs, goals and wishes have been fulfilled. The Quality of Life Inventory examines these dimensions of well-being with the added feature that each domain of satisfaction is weighted according to its importance

to the individual - a unique component of this measure. The proposed research is designed to address the critical first step of determining which of these three QOL measures, each of which arises from a different conceptual framework, is most appropriate for use with chronic pain patients. One-third of the data have been collected to date.

Impact/Future Plans: This project will determine which QOL measure adds unique information to an empirically-determined assessment battery. In addition, the project will provide multifaceted information about the QOL of both men and women with chronic pain, viewed from three different conceptual frameworks.

Funded by the Labatt 24 Hour Relay

Measurement of Intraarticular Pannus Proliferation and Genetic Expression During Joint Contracture Formation

Investigator(s):

G. Trudel	The Rehabilitation Centre
O. Laneuville	University of Ottawa
H. Uhthoff	The Ottawa Hospital
M. Jabi	The Ottawa Hospital

Purpose: People at all stages of their lives and in all degrees of health are afflicted by joint contractures (e.g., clients with muscular dystrophy, diabetes, polytraumas, spinal cord injuries, stroke or arthritis). Joint contractures worsen the original disease despite optimal treatment. Therefore, alternative therapy is required to treat joint contractures. The purpose of this research is to perform genetic studies and determine if the levels of proteins corresponding to the genes we have identified correlate with the initiation and development of contractures.

Description: Rat knees will be immobilized unilaterally with a fixator, causing a contracture to develop. Differential expression of genes in the articular cartilage of immobilized rat knee joints will be assessed at 16 and 32 weeks after surgery. We will also localize and quantify the levels of protein corresponding to identified differentially expressed transcripts.

Impact/Future Plans: This study will identify genetic molecular markers of contracture and measure protein levels of identified differentially expressed transcripts in vivo. Given that studies on humans are not possible yet; our work is currently the only way to advance the treatment of contractures. The findings will identify opportunities for pharmacologic interventions for the prevention and treatment of joint contractures.

Funded by The Physicians' Services Incorporated Foundation

MS Patient Selected Goals in an In-Patient Rehab Unit

Investigator(s):

L. Bloom	The Rehabilitation Centre
N. Lapierre	The Rehabilitation Centre
K. Wilson	The Rehabilitation Centre
D. DeForge	The Rehabilitation Centre
J. Blackmer	The Rehabilitation Centre

Purpose: The purpose of this project is to improve communication between MS in-patients and clinicians in goal setting.

Description: Patients and clinicians are presented with a list of 56 rehab goals. From these they are asked to select the top five goals to be addressed during their rehab stay. Statistical analyses will be conducted to determine the correlation between patient and team goal selection.

Impact/Future Plans: This project will integrate and improve the process of goal identification and selection among patients and team members, and improve communication between clinicians and patients. Future research will focus on developing the process as an outcome measure and formally implementing it with the MS population and also the SCI population.

Funded by the Labatt 24 Hour Relay

Randomized Clinical Study to Measure the Relative Responsiveness and Validity of Two Different Administration Modes of a Feeling Thermometer for Assessing Health Related Quality of Life in Patients with Chronic Respiratory Disease

Investigator(s):

G. Guyatt	McMaster University	D. Stubbing	McMaster University
D. McKim	The Rehabilitation Centre	R. Goldstein	University of Toronto
H. Schunemann	State University of New York	J. Mador	State University of New York

Purpose: To assess the responsiveness of a new quality of life tool in comparison with standard tools, in patients with COPD who are completing an outpatient respiratory rehabilitation program.

Description: Before and after the program patients are administered a number of quality of life tools and the relative responsiveness of the new tools is compared to literature standards (CRQ, SGRQ, SF-36, Global Rating of Change).

Impact/Future Plans: Five patients have been recruited and have undergone the first evaluation. The study has been expanded to the Civic campus of The Ottawa Hospital in order to improve efficiency of recruitment and evaluation.

Sponsored by AstraZeneca

Randomized Controlled Trial of Oxygen and Rollator Walkers in COPD

Investigator(s):

L. Waldegger	University of Ottawa
D. McKim	The Rehabilitation Centre

Purpose: The purpose of this project is to assess the relative impact of oxygen supplementation versus a walker on breathlessness, distance walked and oxygen saturations in patients with severe COPD.

Description: Patients are asked to perform a six minute walk using either oxygen (unaware of gas mixture) or air plus a walker.

Impact/Future Plans: Seventeen out of twenty patients have been assessed and the project should be completed by the end of June 2002.

Graduate thesis funded by The Lung Association

Rate of Speech and Fluency in Reading and Speaking

Investigator(s):

P. Roberts	University of Ottawa
A. Meltzer	The Rehabilitation Centre
J. Wilding	The Rehabilitation Centre

Purpose: To determine whether the rate of speech or the number of disfluencies vary as a function of topic or length of speech samples.

Description: Twenty five English speaking men, aged 20 to 51 years old with at least 12 years education have been tested. Each participant produced monologues on three common topics used in clinical assessments of adults who stutter: job, hobbies and how to play a sport. The speech samples were transcribed and analyzed for the number of disfluencies (interjections, revisions, repetitions, prolongations, blocks). Each speech sample was divided into three lengths: 300, 500 and 800 to 100 syllables. The mean number of disfluencies closely matches the results of American studies conducted 20 years ago, with means of approximately six to eight disfluencies per 100 syllables across all lengths and topics. A 3x3 ANOVA found a significant interaction between lengh and topic ($p < .05$), but no main effects for length or topic. Despite the statistical significance, the differences across topics and sample lengths are so small that on a clinical level, there is no practical difference.

Impact/Future Plans: These results have a number of direct clinical implications. The most important is that clinicians may be able to use short speech samples and still obtain a reliable estimate of disfluency levels. The results of the present study will also be extremely valuable as a point of comparison for a study just begun on disfluency levels of French and bilingual speakers on these same tasks.

Funded by the Labatt 24 Hour Relay

Reducing Disability in Chronic Stroke Through Physical Conditioning: A Dual-Centre Trial

Investigator(s):

S. Olney	Queen's University	J. Nymark	The Rehabilitation Centre
P. McNamara	The Rehabilitation Centre	F. Yazdi	The Rehabilitation Centre
J. Heard	The Rehabilitation Centre	D. Grinnell	The Rehabilitation Centre
N. Bullis	Jack Purcell Community Centre		

Purpose: In spite of intensive rehabilitation in the first few months post-stroke, many individuals continue to experience disabilities once discharged from active treatment. The loss of mobility may cause further deconditioning and physical decline in chronic stroke clients. This research involves a two-site randomized clinical trial led by Queen's University in Kingston in collaboration with an Ottawa team at The Rehabilitation Centre. The study represents a unique and extensive exploration of physical fitness in chronic stroke. The primary objectives are to compare the effectiveness of two physical conditioning programs on an individual's physical impairments, disability and perceived handicap, compared to a control group.

Description: A total of at least 100 participants with chronic stroke from both sites will be recruited over a two year period. Candidates will be randomly assigned to one of the two groups. The two study groups include: 1) an intensive physical group-exercise conditioning program for 10 weeks at a local community centre dedicated for this research (experimental group), and 2) a home-program exercise regime monitored closely for 10 weeks (control group). Participants in the group-exercise experimental program receive gradual progression of strength, flexibility and endurance training. Individuals in the home-program exercise group are taught similar conditioning exercises and receive a written and verbal educational package on maintaining physical fitness post-stroke in their home or community. The Ottawa component started in April 2000 with 40 subjects entered to date. The primary disability and handicap outcomes of the study include the Human Activity Profile, 6 minute walk test, 22 meter walk test , stair-climbing speed and the SF-36 quality of life survey. Secondary impairment outcomes include measures of muscle strength using a hand held dynamometer, and spasticity using the pendulum test. Measures will be obtained before and after the 10 week fitness program and at six and 12 months following the date of admission to the study.

Impact/Future Plans: This research will continue into 2002 with plans to recruit an additional five subjects. The intervention portion of the study will be completed in June 2002 and follow-up outcome visits will continue into 2003. Results of this research will provide better understanding of physical deconditioning following stroke rehabilitation and may eventually lead to more active life-styles for chronic stroke clients.

Funded by the Heart and Stroke Foundation of Ontario

Respiratory Care Protocols for Clients with Spinal Cord Injuries

Investigator(s):

J. Trevoy*	The Rehabilitation Centre
C. LeBlanc	The Rehabilitation Centre
G. Marcogliese	The Rehabilitation Centre
D. McKim	The Rehabilitation Centre

Purpose: The purpose of this project was to develop and implement protocols and educational tools for a multidisciplinary process of respiratory care for patients with spinal cord injury and disease. The overall intent was to enhance respiratory function and reduce the risk of long term secondary complications in this population.

* no longer at TRC

Description: Clients presenting with spinal cord injury and disease often manifest breathing problems that require airway clearance. In the first year of the project an extensive literature review was performed to determine the best ways of dealing with respiratory problems in these clients. Protocols were then developed, as were educational tools for staff and survey tools for evaluation of the project. Implementation of the protocols began in the first year and continued into the second year. Staff evaluations and solicited input allowed for modifications to the protocols and educational tools on an ongoing basis. At the end of the second year, assessment of the implementation was completed and the educational tools were finalized. A CD-ROM version of the protocols and education sessions was created for distribution to other facilities. The protocols are also available through The Rehabilitation Centre's on-line education modules (www.rehab.on.ca/mobile).

Impact/Future Plans: Clients at The Rehabilitation Centre with spinal cord injury and disease now enjoy the benefit of a well structured and empirically assessed intervention. Distribution of the educational CD and promotion of the protocols to other facilities, both nationally and internationally, is ongoing.

Funded by the Ontario Neurotrauma Foundation and the Labatt 24 Hour Relay

Testing Factorial and Gender Invariance of the Pain Catastrophizing Scale

Investigator(s):
J. D'Eon — The Rehabilitation Centre
C. Harris — University of Ottawa
J. Ellis — University of Ottawa

Purpose: This study determined whether the factor structure of the Pain Catastrophizing Scale (PCS: Sullivan et al., 1995) would replicate across a sample of men and women and whether the 13 items comprising the PCS operate equivalently across gender.

Description: There is general agreement that catastrophizing, in relation to the experience of pain, involves focusing on pain; describing negative emotions such as fear and anger; expressing worry about harmful effects of pain; and involves a lack of confidence in one's ability to cope with pain. Catastrophizing consistently emerges as an important predictor of negative outcomes for individuals experiencing pain. Gender differences have consistently been found in catastrophizing, with women reporting higher levels of catastrophizing than men. The goal of this research was to evaluate the factor structure of the PCS and to determine whether the differences found between men and women in response to the scale are due to problems with the measure, or to gender differences in catastrophizing. 227 females and 229 males completed the PCS. The second-order model proposed provided a good fit to the data for both men (CFI=.94) and women (CFI=.95). All constraints were found to hold across gender, with the invariant model providing a good fit (CFI=.94).

Impact/Future Plans: These data support the theoretical conceptualization of catastrophizing, as measured by the PCS, as a singular construct consisting of three components - rumination, magnification, and helplessness. The mean differences found between men and women are not due to an inadequate fit of the measurement or structural model of the PCS for either gender. These data are in preparation for submission for review.

The Effectiveness of Several Physiotherapy Modalities by Conducting Systematic Reviews Using the Cochrane Collaboration Methodology

Investigator(s):
L. Brosseau — University of Ottawa
S. Balmer — The Rehabilitation Centre
Y. Lacasse — Université de Laval

Purpose: Respiratory rehabilitation (RR) is becoming recognized as an important component in the care of patients with chronic obstructive pulmonary disease (COPD). Its widespread application should be preceded by demonstrable improvements in function attributable to the programs. The purpose of this study was to determine the impact of RR on health-related quality of life (QoL) and exercise capacity in patients with COPD

Description: We conducted a meta-analysis of the randomized controlled trials (RCTs) of RR in patients with COPD in which QoL and/or exercise capacity were measures. RR was defined as exercise training (for a least 4 weeks) with or

without education and/or psychological support. The control groups received conventional community care without rehabilitation. Twenty-three RCTs were included in the meta-analysis. Statistically significant improvements were found for all the outcomes. In three important domains of QoL (dyspnea, fatigue and patients' control over disease), the effect was larger than the minimal clinically important difference. Significant improvements were also detected in exercise capacity measured either in laboratory or using simple walk tests. The clinical significance of RR on exercise capacity remains unclear however.

Impact/Future Plans: We concluded that respiratory rehabilitation relieves dyspnea and fatigue and enhances patients' control over their condition. These improvements are clinically important. The importance of the improvement in exercise capacity remains uncertain. RR is an effective component of the care of patients with symptomatic COPD.

Funded by the Labatt 24 Hour Relay

The Effectiveness of the Kinetic Wedge Foot Orthoses Modification to Restore First Metatarsophalangeal Joint Mobility

Investigator(s):
K. Rambarran University of Ottawa
E. Lemaire The Rehabilitation Centre

Purpose: The purpose of this study is to investigate the effects of custom orthoses on the gait patterns of individuals who have been diagnosed with mild to moderate functional hallux limitus (FHL).

Description: Twenty clients of The Rehabilitation Centre's Total Foot Care Clinic will be approached to participate in the study. Prospective subjects include those that have been: 1) evaluated by the staff chiropodist, 2) diagnosed with mild to moderate functional hallux limitus (FHL) and 3) prescribed a pair of custom foot orthoses to improve their condition.

Each subject will receive a pair of custom foot orthoses with the Kinetic Wedge modification and lateral forefoot post. Subjects will use these orthoses for three weeks and then return for testing. An additional pair of orthoses, without the Kinetic Wedge and lateral forefoot post, will be constructed for each subject. This second pair of orthoses will not be given to subjects until they return for testing. At that time, subjects will be asked to complete multiple walking trials along a seven metre walkway under three different conditions: without using orthoses, using orthoses without the Kinetic Wedge modification (E1), and using orthoses with the Kinetic Wedge modification (E2). The order in which subjects receive E1 and E2 treatments will be balanced.

Qualitative data regarding pain will be collected using a numeric pain questionnaire that will be administered during the initial visit with the chiropodist, and at the time of testing. In addition, a questionnaire regarding satisfaction with the orthoses will be administered just prior to testing. Quantitative data to be collected include plantar pressure, as well as kinematic measures of joints (hip, knee and ankle) and segments (torso, thigh, leg and foot).

Impact/Future Plans: It is expected that the Kinetic Wedge will increase the mobility of the first toe joint. These results will contribute to the growing literature on successful treatments available for FHL in the fields of biomechanics and clinical podiatry.

The Impact of Ambulation on Health-Related Quality of Life in Spinal Cord Injury

Investigator(s):
S. Bercovitch The Rehabilitation Centre
N. Mayo McGill University
D. DeForge The Rehabilitation Centre
L. Noreau Université de Laval
J. Fung McGill University

Purpose: The purpose of this study was to investigate the impact of ambulation as a factor of health-related quality of life (HRQL) in the spinal cord injured (SCI) population.

Description: All spinal cord injured clients discharged from The Rehabilitation Centre between April 1991 and December 1997 were contacted by mail and invited to complete a quality of life questionnnaire. Those who were able to walk were asked to participate in a short walking assessment. Three groups were then determined based on ambulatory status. Mean HRQL and other influential factors were analyzed and compared. Results show that those who were poor ambulators did not have better HRQL than non-ambulators, when adjustments were made for important covariates. In fact, those individuals tended to have a lower HRQL than both the individuals who did not walk and those who walked quite well.

Impact/Future Plans: This study provides health-care professionals with new information about the factors that influence HRQL in the SCI population.

Graduate thesis funded by Fonds de la Recherche en Santé du Québec,
the Physiotherapy Foundation of Canada and the Labatt 24 Hour Relay

The Outcome of a Stuttering Treatment Program from the Client's Perspective: The Development of a Communication Status Questionnaire (COM-STAT)

Investigator(s):

A. Meltzer	The Rehabilitation Centre
M. Wright	The Ottawa Hospital
K. Woodend	University of Ottawa Heart Institute

Purpose: The aim of the study is to develop a reliable and valid communication status questionnaire that is capable of detecting change in communication at school, at work, and in social situations, for use as an outcome measure in the treatment of stuttering in adults.

Description: One hundred clients attending The Rehabilitation Centre for treatment of stuttering will be asked to complete the COM-STAT, SF-36, and the Satisfaction with Life Scale at three time points. Fifty clients will complete the questionnaires at the first visit, two weeks later and just before therapy commences. The other 50 clients will complete them three weeks before therapy commences, just before therapy and four months after the start of therapy. Data analyses will assess test-retest reliability of the COM-STAT, construct validity, and responsiveness to change.

Impact/Future Plans: It is believed that the development of the COM-STAT will enable clinicians to evaluate and modify treatment programs for stuttering in adults in order to ensure optimal client outcomes.

Funded by the Labatt 24 Hour Relay

The Use of Botulinum Toxin A in Adults with Cerebral Palsy

Investigator(s):

A. McCormick	The Rehabilitation Centre

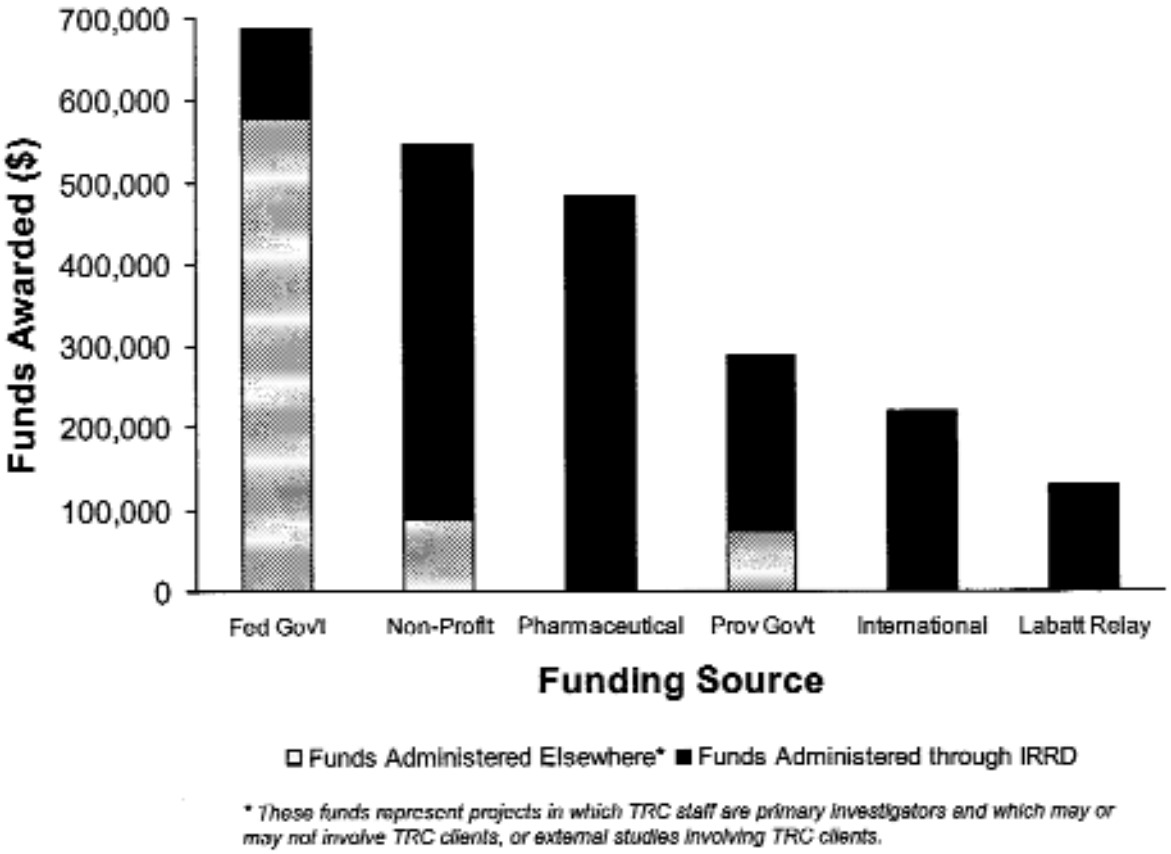
Purpose: The purpose of this randomized double blind placebo controlled crossover study is to assess significant outcomes post Botulinum Toxin A (Botox) injection in adults with cerebral palsy. The study is planned and funded over a two year period.

Description: Adult clients with cerebral palsy and pain associated with spasm will be injected with Botox or normal saline. Six months after the initial injection, clients will crossover to the alternate solution. Outcomes will be measured pre injection, and at one, two, and six months post injection. Measures of pain, spasm frequency, speed of ambulation, stride length, disability, and goal attainment will be collected, as well as the modified Ashworth Scale and the Tardieu Scale.

Impact/Future Plans: This is the first study of the use of this drug in the adult cerebral palsy population. It is hoped that the data collected will help clarify the role of Botox use in individuals who frequently have few acceptable options for treatment. At present we are actively recruiting clients and collecting data. Depending on the results, further study may be required in a certain subsection of the population. In addition, consideration will be given to a follow-up study on the duration of efficacy.

Sponsored by Allergan Inc.

Funding Summary



** These funds represent projects in which TRC staff are primary investigators and which may or may not involve TRC clients, or external studies involving TRC clients.*

Between January 2001 and March 2002, there were 40 research projects ongoing or initiated. Thirty five (88%) of these projects were funded, with a combined total just under $2.5 million. Forty four percent of the funds were awarded for projects initiated since January 2001, while the remaining funds reflect ongoing projects. Of the 35 funded projects, 6% of the funds were obtained from the Labatt 24 Hour Relay, while 94% were obtained from external sources. A total of 48 grants were awarded to the 35 funded projects, with seven projects securing funds from more than one source.

PUBLICATIONS

Refereed Publications

Blackmer, J. (2002, January). Parkinson disease. *Physical Medicine and Rehabilitation* [eMedicine Journal], *3* (1). Available URL: http://www.emedicine.com/pmr/topic99.htm

Blackmer, J. (2001). Tube feeding in stroke patients: A medical and ethical perspective. *Canadian Journal of Neurological Sciences, 28,* 101-106.

Blackmer, J., Vellet, D., & Zochodne, D. (2001). Isolated radial nerve palsy associated with fracture of the triceps muscle. *Canadian Association of Radiologists Journal, 52,* 322-324.

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Lemaire, E.D. *Plugging into telehealth.*

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Lemaire, E.D., Fawcett, J., Nielen, D., & Leung, A.K.L. *Telehealth strategies for remote prosthetic applications.*

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AWARDS

In the fall of 2001, **Marcel Desrosiers, Occupational Therapist**, won the Governor General's Medal for academic excellence in the Master of Education program at Université du Québec à Hull. He was honored for developing a new student clinical placement evaluation tool, which is currently being piloted at several clinical sites and will be implemented within the Occupational Therapy Program at the University of Ottawa in September 2002.

Donna Kettyle, Nursing Discipline Leader, received a Distinguished Service Award in November 2001 from the Ontario Association of Rehabilitation Nurses. She was honored for her work in chairing a National Steering Committee for CNA (Canadian Nurses Association) certification of Rehabilitation Nurses.

Julianne Labreche, Speech Language Pathologist, received the 2002 Canadian Association of Speech-Language Pathology and Audiology (CASLPA) New Media Award. She was recognized for innovation in new media for her "Animal-Assisted Therapy" website and TRC's Animal-Assisted Therapy web page.

The Terry Fox Hall of Fame recognizes distinguished Canadians who have made significant contributions assisting or enhancing the lives of physically disabled persons. On November 14, 2001, **Dr. Jamie MacDougall, Director of Research**, was inducted into the Terry Fox Hall of Fame in the *Builder* category for his research in rehabilitation, language, literacy and deafness, sexuality and disability, and the demographics of deafness in Canada, as well as for being a strong advocate for the rights of deaf people in their dealings with the legal and medical systems.

Dr. Keith Wilson, Psychologist, received the 2001 Hospital Psychology Association of Ontario Award on February 14, 2002 at the annual convention of the Ontario Psychological Association. Dr. Wilson is an outstanding clinician, educator, mentor and internationally recognized researcher, who has made significant and diverse contributions in the field of Rehabilitation Psychology.

Congratulations!

RESEARCH UPDATES

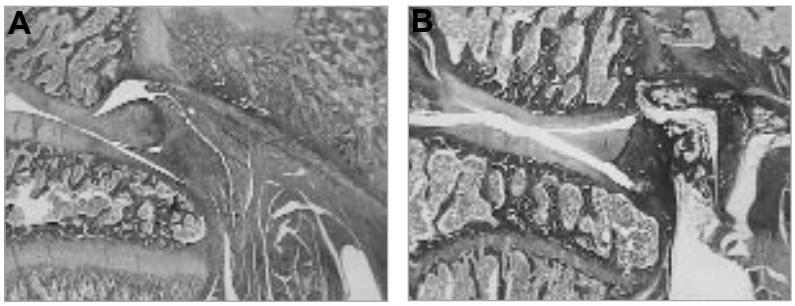
Biological Research on Joint Contractures

Joint contractures are the most common musculoskeletal complication of chronic diseases, however, their causes and mechanisms are unknown. What is known is that they are difficult to treat, they require large amounts of resources, and that current treatments produce frustrating results. This is due to the fact that joint contractures superimpose disability on to people who already have physical limitations to overcome.

Throughout the past year, we have continued to lead groundbreaking collaborative research into the mechanisms of joint contractures. Important progress has been made in the following areas:

1) Methods to quantify synoviocyte proliferation: After much preliminary work, we have succeeded in completing the first in vivo study on the proliferation of synoviocytes in developing joint contractures. We were able to identify that proliferation is actually decreased during contracture formation, a finding that is contrary to current thoughts on the disease.

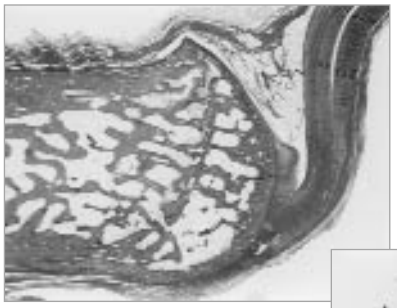
Our unique set of methods, from animal model to histological techniques, has allowed us to uncover other key concepts. For example, we found that synovial intima responds to the suppression of stress through increased adhesion of the extracellular matrix. This is the first report of such mechanotransduction in the synovial intima. In addition, changes were noted only in one half of the joint. These findings provide evidence for local or paracrine mediators and mechanisms in the pathophysiology of joint contractures and represent a new concept in the field of joint contractures and joint diseases.



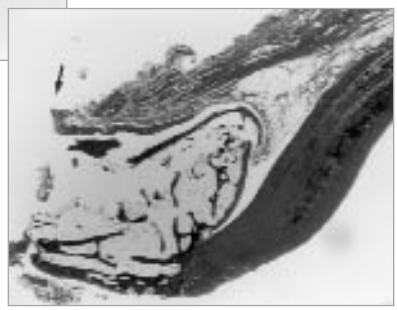
***A)** Tissue from the sham-operated joint exhibits nice folds and villi at 2 weeks. **B)** In the 32 week immobilized joint, adhesion caused not only a decrease in intima length, but a mechanical obstruction to extension as well.*

2) Genetic studies: To date, our team is the only group to gather genetic data on the mechanisms of joint contractures. Over the past year, we continued our research efforts to confirm the expression of specific genes in the cartilage during joint contracture development.

3) Effects of immobility: In addition to our work on the effects of immobility on joints leading to contractures, we also investigated the mechanical and histological effects of immobility on tendons. Our results were in part predictable, but surprising in other ways. Although tendons became weaker with immobility, there was no atrophy and they were stronger than the bones to which they attached. These results will be important in the rehabilitation of individuals requiring a prolonged course of bed rest.



In the normal animal (left), mechanical testing to failure led to avulsion of the tendon at insertion. In the immobilized specimen (below), marked disuse bone atrophy led to a fracture at a much lower force than controls. Notice the normal tendon appearance.



The findings obtained during the past year will provide direction for our future research efforts, and hopefully redirect other researchers in seeking the mechanisms and mediators of joint contractures. Ultimately, we hope the benefits of our research will come full circle to help the clients who suffer from the limitations imposed by joint contractures.

We would like to acknowledge the Canadian Institutes of Health Research for supporting the continuation of our research endeavours. We would also like to thank the Institute for Rehabilitation Research and Development, and the Division of Physical Medicine and Rehabilitation at the University of Ottawa for their continued support. They have underscored the importance of research into this disease by fostering the establishment, growth and rise of our research team.

Chronic Pain and Insomnia: A Program of Research

About 11 years ago, when I began working with clients who struggle on a daily basis with chronic pain, I was soon impressed with how poorly they seemed to be sleeping. Person after person came into the pain clinic complaining of feeling tired, dragged out, fatigued and irritable because of a lack of restful sleep. When we asked them why their sleep was so disrupted, the answer seemed obvious - their pain kept them from being comfortable in bed, and the constant ache kept them awake at night.

Around that same time, there were some exciting new developments in the treatment of chronic primary insomnia. "Primary" insomnia is a habitual sleep problem that is characterized by feeling too alert and aroused at bedtime, and spending long periods at night with racing thoughts from a mind that won't shut off. Just about everybody experiences insomnia like this sometimes, but it has become a way of life for about 10% of the general population. Although medications are the traditional mainstay of therapy for chronic primary insomnia, the long-term use of medication for sleep can bring about other problems, like poor quality sleep, decreased alertness through the day, and "rebound" insomnia after cessation of the medication. If there were some other alternatives that did not involve medications, they could be a real boon for that large minority of the population who really don't sleep well.

In fact, psychologists have been working on a number of approaches that do help people sleep better. Some of these approaches make a lot of intuitive sense, like relaxation exercises to lower arousal and education about environmental and dietary factors that can disrupt sleep. Other approaches have, until recently, been viewed as more experimental. They consist of various behavioural techniques designed to alter sleep habits and increase sleepiness. When these methods are put together as a multicomponent package, the available research suggests that after a few weeks of practice they result in improvements in sleep that are as large as those seen with sleeping pills, and their benefits last for a long time.

The question arose, therefore, as to whether these methods might be applicable to people whose sleep disturbance is associated with chronic pain. The answer to this was not entirely clear at the outset of our research program; remember, the methods were developed to treat "primary" insomnia in medically healthy people who had fallen into the habit of getting too ‘revved up’ at night to sleep. It was by no means certain that these approaches would be helpful to people who had "secondary" insomnia because of pain. In fact, we had some concern initially that the behavioural approaches might actually make people worse, by triggering pain flare-ups. So, we set off on a systematic program of research to investigate the prevalence and correlates of insomnia in people with chronic pain, and also to do some preliminary work in the area of treatment.

In our first study, we interviewed 150 patients who were attending pain clinics at The Rehabilitation Centre. We asked them about their sleep, and also about their mood. We found that about two-thirds of the people with chronic pain had clinically significant insomnia. The patients who reported the highest levels of depression also had the highest rates of insomnia, but many of those who were not depressed still reported that they slept poorly (Wilson, Mikail, D'Eon, & Minns, 2001; Wilson, Eriksson, D'Eon, Mikail, & Emery, 2002). Compared to those individuals who did not complain of insomnia, the insomniac patients had higher pain intensity levels, and greater self-reported disability on some measures. Therefore, insomnia seemed to add to their troubles - and maybe even their pain - above and beyond what could be explained by depression.

In our next study, we asked 40 people who had insomnia secondary to chronic pain to complete sleep diaries for two nights, and also wear activity monitors on their wrists while they slept at home. The activity monitors measure movement, and if someone is tossing and turning all night, we can actually record it. We found in this study that both the diary reports and the activity monitors showed that the participants were indeed sleeping in a fitful and fragmented way, but the correlation between the two assessment methods wasn't that high (Wilson, Watson, & Currie, 1999). So at the group level, we were able to provide physical verification as to the severity of the sleep disorder that is experienced by people with chronic pain. At the individual level, however, there was not a good person-by-person correspondence between how someone looked on the activity monitor and how well they felt they had slept.

Next, we wondered if we could treat pain-related insomnia using a non-pharmacological approach. Shawn Currie, a graduate student in psychology at the time, took on this project as his doctoral dissertation. To begin with, we actually had to write a book - basically, a self-help book that took all of the validated behavioural interventions for insomnia and tailored them to the specific circumstances of people with chronic pain. We then recruited 60 people who were willing to give our treatment protocol a try. Half of this group was assigned randomly to take part in a seven-week outpatient therapy program

(consisting of one 2-hour session a week), or to go on a waiting list as a control condition. We found that the behavioural methods that were used with the experimental group were actually very effective in helping to improve their sleep efficiency and sleep quality, and reducing the amount of time they spent awake during the night (Currie, Wilson, Pontefract, & DeLaplante, 2000). Over 70% of participants had some measurable improvement in their sleep. Furthermore, this improvement was verified physically by changes in the activity monitor recordings before and after treatment. Finally, we were encouraged to find that nobody got worse. This was quite an important study, because it was the first randomized, controlled trial of the psychological treatment of insomnia that was conducted with a medical population. As such, it set the stage for a whole new area of research and therapy.

The patients who were assigned to the control condition were also offered the treatment after their participation in the study was over. After all of these treatments were completed, we conducted a secondary analysis on the data to look for predictive factors that might tell us something about the clinical characteristics of people who respond well to the program versus those who do not (Currie, Wilson, & Curran, in press). There actually turned out to be very few predictors of treatment outcome. For example, there was no association with demographic characteristics like age or gender, or with clinical characteristics like pain intensity and duration, or even with the severity of the insomnia at baseline. The strongest predictor seemed to be "sleep self-efficacy," which translates roughly into a person's level of confidence in their ability to make changes in their sleep habits. Maybe some people know even before they start a treatment program that they are going to have trouble making any meaningful changes!

Because this was our first treatment study, we were cautious about who we were prepared to accept into the trial. For example, we did not accept people who were too depressed at the time of the baseline interview, thinking that there might be aspects of the treatment protocol that could conceivably be harmful to participants who had fragile mental health. However, this meant that we screened out a lot of potential participants, because depression is a very common problem among people with chronic pain who come to The Rehabilitation Centre. We also know that the more depressed people report the worst insomnia (Wilson et al., 2002), although we're not sure whether we can confirm this with more objective measures of sleep. At this point, we have begun several more in-depth studies of the associations between insomnia, depression and pain.

For her doctoral dissertation, Katherine Harman asked a group of patients with chronic back pain to spend several nights in a sleep laboratory while EEGs were recorded (Harman et al., under review). As with our earlier research, Katherine found that participants who were diagnosed with depressive disorders reported very poor sleep, but they seemed similar to non-depressed participants on the EEG. Unfortunately, though, we could only recruit a small sample of participants to take part in this rigorous study, so the physiological findings may not be all that robust. Therefore, in a subsequent study that is about to begin recruitment, graduate student Patricia Emery will be collecting data from sleep diaries and activity monitors, and will closely examine the impact of depression on sleep using a prospective design. Since the participants will be able to sleep at home in Patricia's study, we hope to be able to recruit quite a large group over the next couple of years.

Clinicians at The Rehabilitation Centre may also have noticed that we have included a section on sleep in the new Pain History Questionnaire developed by Dr. Joyce D'Eon. This questionnaire is completed by all of the patients referred to the Chronic Pain Service. At some point when a sufficient database has been built up, we will be able to use this information to do statistical modeling of the correlations between pain, sleep and depression, and sort out for sure the nature of the underlying associations.

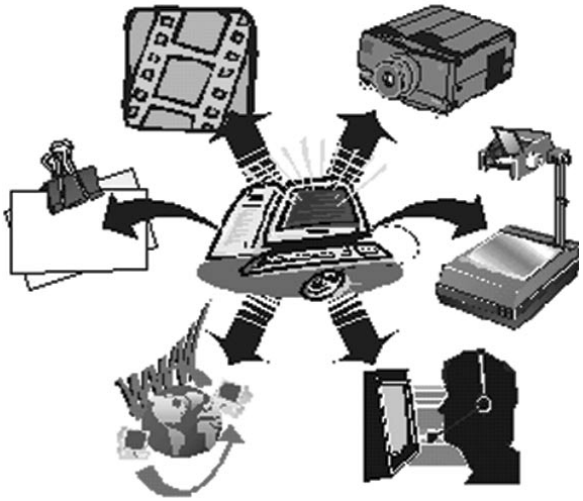
In summary, our program of research into insomnia in chronic pain has been quite a productive one. We have done the most detailed studies to date of the prevalence of this problem, conducted preliminary investigations into its clinical and biological correlates, and completed the first randomized controlled trial into its treatment. Moreover, an updated version of the patient manual that we wrote for the treatment study has recently been published as a self-help book (Currie & Wilson, 2002). Although we still have a lot to learn about helping people with painful disabilities sleep better, this is one area where The Rehabilitation Centre is helping to lead the way.

Computer Applications for Physical Rehabilitation

Computer-based research and development through the Institute for Rehabilitation Research and Development has made advances in access to health resources, telehealth technology integration, and Internet-based clinical and e-Learning applications. These advances were made with the cooperation of many local, national, and international partners.

E-learning

E-Learning has been defined as "the use of network technologies to create, foster, deliver, and facilitate learning, anytime and anywhere." (http://www.linezine.com/elearning.htm). Our Write-Once Publish-Everywhere approach for e-Learning has proved to be a viable method for providing continuing education services in urban and rural communities. In conjunction with the Terry Fox Mobile Clinic and The Rehabilitation Centre's Respiratory Service, we have developed a portfolio of 26 education modules that cover topics from Wheelchair Transfers to Communicating with a Person with Hearing Loss. These modules are made available for notebook computer presentations, desktop video conferencing sessions, web-site content, Internet streaming media (RealPlayer), CD-ROM, overhead transparencies, and paper handouts. Our on-line e-Learning content has been accessed by people throughout the world and the CD-ROM version has been sold to educators across North America.



The project team evaluated the Write-Once Publish-Everywhere approach with nine health care institutions in Eastern and North Eastern Ontario and with disability representative from the Disability Awareness and Prevention Program. Questionnaire and consumer feedback results confirmed that these learning modalities, and the content development strategy, provided an accessible and effective learning environment. Evaluation participants considered each learning modality necessary to overcome access issues for continuous learning (i.e., inability to attend lectures, travel costs, computer access in workplace, workplace computer deficiencies, etc.). This evaluation was funded by the Office of Learning Technologies (Human Resources Development Canada) and the Labatt 24 Hour Relay.

Future directions for our e-Learning research program include continued development of new learning modules, improving the content formatting process, implementing new Internet streaming media technology, and exploring integration with handheld computers. We are also starting an international project to use the Write-Once Publish-Everywhere for real-time/synchronous continuing education.

Telehealth for Remote Control of Assistive Devices

Our prosthetics research team is in the process of completing a study to evaluate our desktop video conferencing approach for remote control of the Otto Bock C-Leg prosthesis. The C-Leg is a computer controlled trans-femoral prosthesis that dynamically adjusts swing phase kinematics during gait. Microsoft Windows-based software (Sliders) is used to configure the device. After successfully using the Microsoft NetMeeting video/data conferencing environment to remotely configure the C-Leg over a network Internet connection, our team is completing a project to validate the process over a public-Internet/DSL connection. If our telehealth approach is acceptable for clients and clinicians, people with amputations could obtain help with their computer controlled prostheses from anywhere with broadband Internet access. Prosthetists will also benefit since they can use this approach to connect with manufacturers to resolve problems and to obtain training on new technology. This project is funded by the War Amputations of Canada.

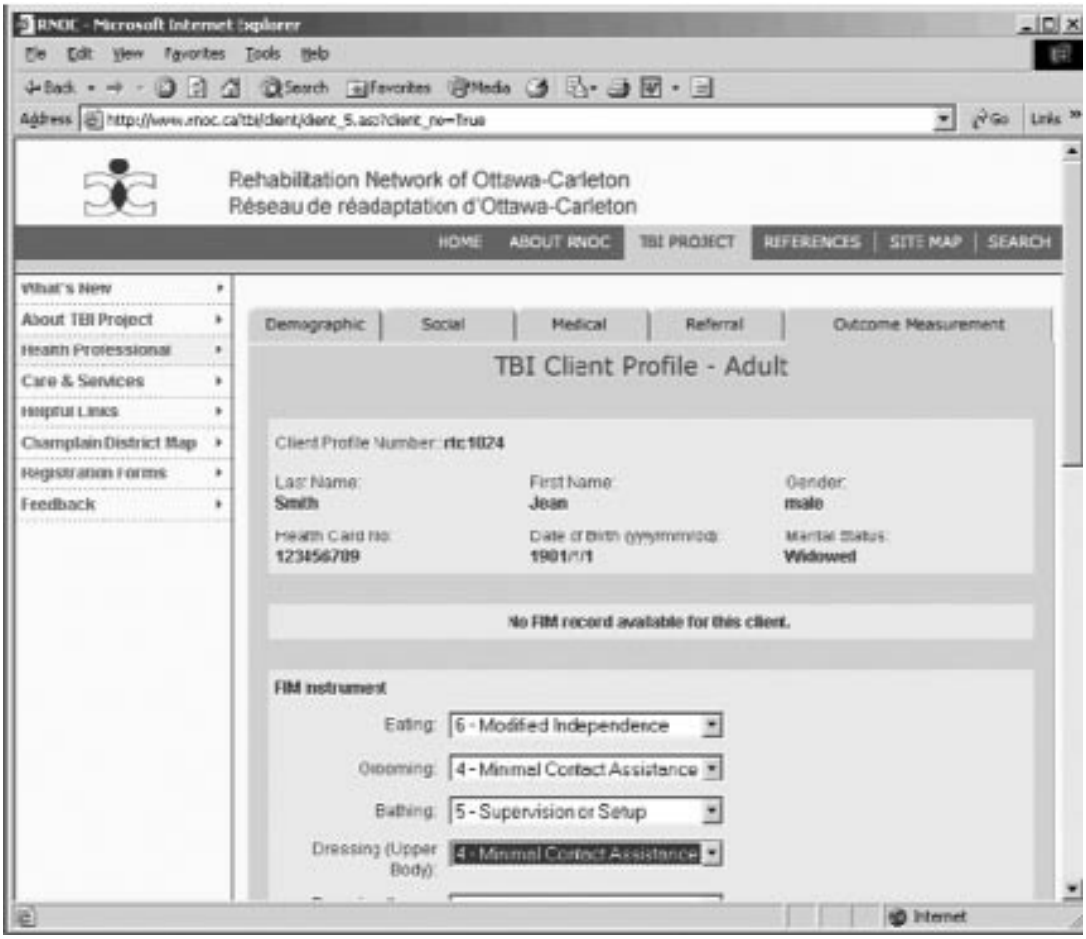
Telehealth for Physical Rehabilitation and Long Term Care

In 2002, we plan to conduct a national project for knowledge development and exchange for tele-rehabilitation and tele-geriatrics. Over the project's 16 month duration, project partners will amass information on the current state of telehealth for physical rehabilitation and long term care. Information will be divided into clinical, policy, and training sectors. Experts will review this information and identify the strength and challenges for telehealth implementation and sustainability. Potential partners include the Institute of Biomedical Engineering (University of New Brunswick), Faculty of Rehabilitation Medicine (University of Alberta), SCO Health Service (Ottawa), G.F. Strong Centre (University of British Columbia), and Baycrest Centre for Geriatric Care (Toronto). Project results will serve as a blueprint for improving how health outreach services are delivered.

A Web-based Client Tracking Database for Traumatic Brain Injury

In Eastern Ontario, people with traumatic brain injury (TBI) move through many layers of the health care system. A smooth transition through acute care, rehabilitation, transitional living, and community integration to home care is inhibited by inadequate flow of information between health care providers. An added level of complexity for this transition is that health care providers could be from hospitals, community clinics, or the private sector.

To address these issues, a web-based portal was developed to enable clinicians to enter and access client information that will assist with transition of care. From a computer perspective, a secure environment was created using password protection, 128-bit encryption, and digital certificates. The user interface was developed in HTML and Javascript to ensure compatibility with version 4.0 and high web browsers (i.e., no third-party plug-ins required). The database back-end was programmed in Microsoft SQL Server. User evaluation of this system is in progress. Back-end client tracking is used to monitor appropriate use of the client information. Funding for this initiative is from the Ontario Ministry of Health and Long Term Care and the Ontario Neurotrauma Foundation.



Then...

Gait and Motion Analysis Laboratory

Celebrating 20 Years as a Clinical and Research Facility

Movement science contributes to the advancement of clinical practice and our understanding of physical rehabilitation. The study of mechanical principles and neuromuscular control systems are fundamental to our understanding of pathological movement disorders. The Gait and Motion Analysis (GAMA) Laboratory at The Rehabilitation Centre was developed in 1981 as a specialized clinical and research facility integrating movement science, engineering and advanced technology for use by rehabilitation clinicians, researchers and consumers. The following article is a brief historical overview of our work to recognize this benchmark 20 year anniversary. The present and future strategic plans for the GAMA Laboratory are based on this groundwork.

Historical Overview

The GAMA Laboratory was located within a clinical setting to merge clinical service and research knowledge. This combination provided objective evidence for clinical treatments efficacy and facilitated clinically relevant research. Close interaction between the GAMA team and clinicians often generated research questions that have successfully contributed to the science of rehabilitation.

The core GAMA team includes experts in rehabilitation engineering, biomechanics, computer technology, physical therapy and medicine. This interdisciplinary team:

- provides a unique clinical service to analyze movement and walking patterns for people with disabilities of all ages to assist in clinical decision-making;
- contributes to outcome-based rehabilitation science through funded research endeavours and innovative technological methods;
- teaches and trains undergraduate and graduate students, staff and the healthcare community.

Clinical Service

As a forerunner in the Ottawa region, the GAMA Laboratory offers clinical evaluative service for referring clinicians. Our facility provides comprehensive, objective measures of muscle performance, static balance, and motion analysis for individuals with physical disabilities. These measures are typically used to identify specific deficits and evaluate change in performance. Clinical populations have spanned orthopaedic conditions (pre and post joint arthroplasty surgery, chronic pain, leg length discrepancies), neurological populations (upper and lower motor neuron in adult and children), and lower limb amputees. To foster mutual knowledge transfer and clinical relevancy, physical therapy clinical placements have been available within the Laboratory. Over the years, this interaction has led to pilot work and funded research. This model has the potential to be offered to a variety of disciplines.

Research and Development

Research and development activities are often with academic, healthcare, corporate and government partners. This work includes:

- design and testing of novel treatment interventions such as dynamic, computer-assisted biofeedback systems (stroke and amputee), functional or dorsal column electrical stimulation; weight-supported treadmill training, prosthetic innovations (simulated above-knee prosthesis, product testing) orthotic designs and drug therapies
- design and evaluation of new measurement techniques such as the identification of foot plantar shear forces, quantification of muscle co-activation in gait, speed and magnitude of weight acceptance in lower limb amputees, parallelogram hand-held goniometer, postural reactions to a tilting surface, software design to measure histologic sections, and a remote gait analysis tool
- innovative tests ranging from wheelchair stability to walking aids
- development of a normative gait database for overground and treadmill walking at a variety of speeds
- experience in consumer participation in the research process including the design and implementation of an exit questionnaire for participating subjects

Academic and Clinical Teaching

Teaching involves undergraduate and graduate students with team members who hold joint appointments with the Faculties of Medicine or Health Sciences, University of Ottawa. Undergraduate involvement includes lectures in biomechanics and locomotion, student clinical placements in the Laboratory and supervision of investigative projects. Graduate studies include teaching and supervision of graduate research.

2002 Strategic Plan

Neurological gait recovery focus involves the evaluation of gait enhancement strategies with patients following brain or incomplete spinal cord injuries. A focus is on the evaluation and treatment of paresis and spasticity to enhance mobility.

Lower limb prosthesis and orthotic innovative designs are underway using advanced computer technology aimed to improve patient outcomes.

Development of normative gait database is ongoing, representing various gait speeds and walking surfaces (overground and treadmill) in order to provide comparative data for clinical and research endeavours.

Biomechanical evaluation of assistive devices is provided ranging from stability testing of wheelchairs to innovative walking aids.

Multi-media distance communication and consultation is developing with a specific focus on the development of off-site clinical movement and gait analysis in rural settings or collaborating research facilities.

Acknowledgements

Key factors that have contributed to our growth are:

- experienced, dedicated, expert team supported by The Rehabilitation Centre
- advancement of computer and imaging technology
- unique contributions of clinicians
- academic collaborators and advisors
- funding support

In addition to the support of The Rehabilitation Centre, the team acknowledges the following funding sources: Ontario Ministry of Health (Research Awards); Harold Crabtree Foundation; The Royal Ottawa Health Care Foundation; American Paraplegia Society; American Paralysis Association; US National Institutes of Health; NeuroMotion Inc, USA; Seattle Limb Systems; Heart and Stroke Foundation (Ontario); Christopher Reeve Paralysis Foundation (USA); War Amputations of Canada; ipos Orthopedics; Physician Services Inc.; Industry Canada.

The GAMA Laboratory team gratefully acknowledges the valuable past and present academic collaborators and advisors:

- University of Ottawa, Ottawa: G. Robertson, H. Sveistrup, E. Melis
- Queen's University, Kingston: S. Olney
- McGill University, Montreal: H. Barbeau
- University of Strathclyde, Glasgow: J. Paul, S. Solomomidis
- University of California, Los Angeles: B. Dobkin, S. Harkema
- Parkwood Hospital/University of Western Ontario, London: K. Hayes

Based on our strong team efforts, characteristic of the nature of rehabilitation, we are well placed to build new avenues of clinical and research innovations with our consumers and clinicians, as well as our academic and corporate sponsors. We are grateful for the dedication of our staff, students and volunteers. The GAMA team looks forward to a new partnership with The Ottawa Hospital and the challenges and inspirations that lie ahead.

Core Team Members: S. Balmer, D. DeForge, L. Goudreau, S. Leclair, E. Lemaire, S. Millar, J. Nymark, P. O'Neill, J. Tomas, F. Yazdi

...and now

Program Evaluation Initiative

The Program Evaluation Project was initiated as a corporate venture in 1996. At that time a comprehensive literature review and internal survey was conducted and the final report was widely circulated both internally and externally. Subsequently, a successful pilot project using a program evaluation approach was conducted on the stroke service to determine the feasibility of data collection and its appropriateness with respect to evaluating clinical outcomes. In 1997, The Rehabilitation Centre (TRC) participated in the pilot testing of the Rehabilitation Minimum Data set for the Canadian Institute for Health Information (CIHI). The focus of the initiative then shifted to assessing the success of programs and services by measuring client satisfaction. To this end, two comprehensive surveys of client satisfaction with outpatient services have been completed at TRC.

In 2001 the internal survey of program evaluation activity, which was completed in 1996, was repeated. Two formal program evaluation projects were found to be underway at that time. These were: "The evaluation of an Acquired Brain Injury Community Reintegration Program", which was funded by the Ontario Neurotrauma Foundation and the evaluation of the Chronic Pain Service.

The transition of TRC from being a member of the Royal Ottawa Health Care Group to a subsidiary corporation of The Ottawa Hospital saw the development of a strategic plan for TRC. Program evaluation has been identified as a priority under the success factor "create best practice with those we serve". A model for program evaluation, which evaluates structure, process and outcome, has been adopted for use across the centre and work has commenced with some patient care services to prepare them to implement this model. This work is being done in concert with the work of the Clinical Organizational Performance Measurement Group which has been developing performance indicators for TRC. Finally, a large focus for the program evaluation Initiative will be on the implementation of the National Rehabilitation Data Set of CIHI this fall. It is envisioned that this database could be used as a platform for other program evaluation activities.

Program Evaluation on the Chronic Pain Rehabilitation Service

In January 2002, the Chronic Pain Rehabilitation Service (CPRS) implemented an outcome evaluation of the inpatient and outpatient programs provided to individuals with chronic pain. The CPRS has examined services in the past, including research determining the most appropriate questionnaires to assess patients, as well as the extent of individual patient change in depression, coping and activity level. As the CPRS has developed more integrated rehabilitation programs over time, there is currently a need for a comprehensive evaluation of outcome.

Areas of investigation and measures to be used were selected based on previous research conducted by the team, an updated review of the literature, team meetings, as well as individual discipline planning. In considering areas of investigation, the CPRS targets and expects to have a positive impact on symptoms of depression, coping, sleep, physical functioning, daily activities, disability, health care usage and quality of life. Some research has also indicated that chronic pain rehabilitation programs can reduce pain and medication usage, and improve social functioning.

The clinical evaluation includes the newly developed Pain History Questionnaire (which examines medication, sleep and employment status), the Beck Depression Inventory, and diagnostic classification, as determined by the International Association for the Study of Pain classification. Physiotherapists on the CPRS evaluate clients' functional status by means of a walk test. For this evaluation, the following measures have been added: Sickness Impact Profile - Rolland Scale, Pain Catastrophizing Scale, Chronic Pain Coping Inventory, and the PRIME-MD. Both patients and team members also provide an overall evaluation of individual outcome. While a commonly used outcome measure in chronic pain evaluation is return to work, given the chronicity of the pain reported by clients seen at this centre, it was determined that a more broad-based outcome measure, such as quality of life, was important and likely more sensitive to change. As such, the World Health Organization, Quality of Life questionnaire was chosen.

Responses of 40 inpatients and 40 outpatients will be examined. Pre-treatment, post-treatment and follow-up evaluations have been added to the standard assessment protocol. Patients are provided with information about the project and the voluntary nature of their participation. Individuals who return for the follow-up evaluation are given parking chits to offset the increased costs incurred by attending the follow-up session. A database has been constructed by IRRD for the evaluation and it is expected that this evaluation will be completed in 18 to 24 months.

Rehabilitation Engineering Service

Rehabilitation Engineering adds a professional engineering dimension to the rehabilitation process by the application of the most appropriate technology and engineering know-how. Rehabilitation Engineering provides clinical services, is involved in research activities, performs technology assessments and participates in projects related to the commercialization of rehabilitation products.

Clinical Services

Clinical services include creating custom assistive devices for persons with physical disabilities or adapting existing equipment to meet a specific individual's needs when no commercial system is available. Other clinical services include engineering consultations, repair and maintenance of custom or modified equipment, and the creation of custom therapy or patient care equipment.

Rehabilitation Engineering can become part of any clinical team that requires our input into client care. We are members of the interdisciplinary Gait and Motion Analysis (GAMA) Laboratory at TRC. A major contribution to the GAMA team over the past year has been the continued development and installation of custom transducers and signal processing equipment, as well as the development of data analysis software. These efforts expand both the clinical and research capabilities of the laboratory.

We are also members of the Technology Access Service (TAS) team, which is an Ontario Assistive Devices Program accredited augmentative communication clinic. We have been involved in computer set-ups for clients, training and education, troubleshooting, and custom modifications required for computer or augmentative communication device access.

Research

Rehabilitation Engineering participates in many research and development activities. One ongoing research project is: "A validity-based evaluation of the driving assessment program for stroke patients". Rehabilitation Engineering staff continue to be involved in research carried out in the GAMA Laboratory. Custom research instrumentation has been designed and/or fabricated for several research projects conducted at TRC and at the University of Ottawa. Such contributions have included: foam models of bone for orthopedic research, a touch pad apparatus for balance research, and enriched environment cages for research of neurological disorders. Collaboration with the Toronto Chapter of The Ontario March of Dimes DesignAbility is ongoing to develop a program that will provide accessible infant cribs, designed at TRC, to parents in the Toronto area.

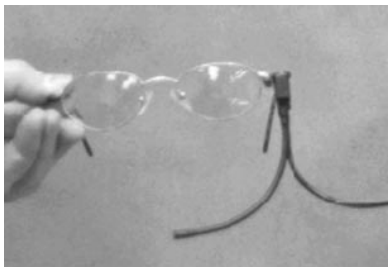
Technology Assessment

Technology assessment and consultations are carried out for manufacturers of mobility and other assistive devices. TRC is one of two mobility device test centres in Ontario who advise the Assistive Devices Program (ADP) on whether devices should be found eligible for funding. Mobility devices undergo technical and clinical evaluations to determine safety and performance characteristics. During the past year, full evaluations for 5 products were completed for ADP.

2001 Projects

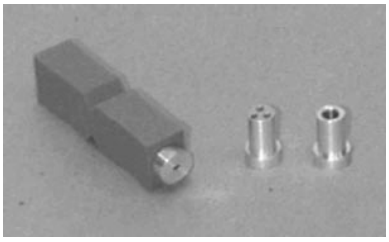
The following are some examples of projects completed during this reporting period. Most of our work is devoted to adapting and creating aids and devices to give more function and independence to persons with physical disabilities. Some modifications are simple, while others require a more complex solution. All demonstrate the innovation and dedication of the project teams. We collaborate with clients, their caregivers and other health professionals at TRC and other facilities in Ottawa to arrive at the best possible solutions.

Microphone Modified to Clip on Eyeglasses



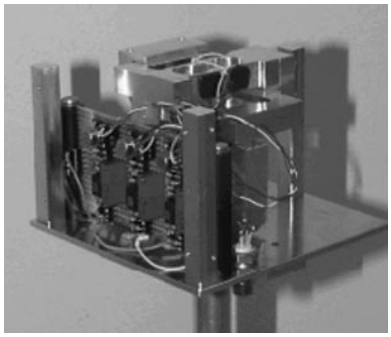
A client had a headset microphone that needed modifications because the headband interfered with her eyeglasses and was also too strong to be easily put on and removed from her head. The solution was to remove the headband altogether and mount the microphone on the eyeglasses. A small customized clip was designed and attached to the microphone. This allowed the client to clip the microphone on and off her glasses with one hand.

Shear Specimens Used in Orthopedic Research



Dr. Uhthoff, at the University of Ottawa, is conducting orthopedic research into different methods of reattaching pieces of bone. This study examines the shear force necessary to separate two pieces of bone that have been attached with either screws or wires. Substitutes for actual bone specimens were constructed using PCF-20 foam. Three different aluminum inserts were also made that are used as guides for either the wires or screws.

Highly Sensitive Touch Pad Apparatus Used in Balance Research

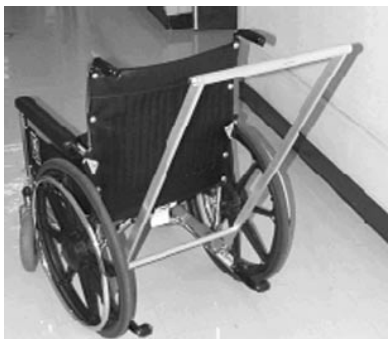


A touch pad apparatus was needed for balance research conducted by Dr. Francois Tremblay at the University of Ottawa. The study investigates whether people have better balance if they lightly touch something with their hand. The object touched acts more as a reference point than a support, and therefore the force applied is extremely small. The touch pad apparatus was built to measure the amount of touch force in three dimensions, and uses strain gauge amplifiers to increase the signal of the extremely sensitive measurements.

Joystick Controller Embedded in Flip-Up Lap Tray

The client uses a joystick to control her power wheelchair. Originally, the joystick was mounted at the usual location of the armrest. Unfortunately, she found it uncomfortable to keep her arm to the side. A more comfortable position was found with her arm resting across her lap tray. A section of the plexiglass was cut out near the center of the tray and the joystick controller was mounted there.

Quick-Release Stroller Handles for Manual Wheelchair



This device was made specifically to help the person pushing the wheelchair rather than for the person sitting in it. The person being cared for often behaves aggressively towards the caregiver and has, on occasion, tried to bite them. The stroller handles were made to allow the caregiver to stay at a safe distance. The handles can be attached easily at the rear of the chair by sliding them along guides mounted on the chair frame. To be removed, the handles simply need to be lifted up and pulled back from the chair. Once attached, the handles provide a firm hold for pushing, pulling and even tilting the chair backwards.

Shorter Overall Length for a Tilting Power Wheelchair with a Ventilator Tray

The client's power wheelchair was awkward, if not impossible, to fit into small spaces because of the extra length of the ventilator tray. It was determined that the overall length could be shortened in two ways. First, the tray was cut shorter by 3 inches. Second, the linkage connected between the tray and the backrest was modified to be under the tray and seat instead. This eliminated a 4½ inch gap that existed between the tray and the backrest when the seat was in the upright position. In total, the wheelchair was made nearly 8 inches shorter.

Modified Control Arm for Signal Lights and High-Low Beams

A modification of a client's car was necessary because of a loss in function of their left arm. A control arm was designed to allow the signal lights and high-low beams to be controlled using the right hand rather than the left. Another control arm was mounted on the steering column of the client's car and one end was attached to the original control arm. The mount pivoted in two directions; up and down to activate the turn signal, and back and forth to activate the high-low beams.

Holder for Two Oxygen Tanks In Place of One Large Tank

A client who used a tilting power chair was also in need of an oxygen tank. If one large tank was used and mounted on the wheelchair base, it would increase the overall size of the chair making it difficult to manouevre in tight spaces. If a large tank were mounted on the backrest, the wheelchair would be less stable when tilted, and the tank would stick out beyond the backrest ,risking damage. It was decided to use two smaller tanks instead. A customized holder was made that held the tanks together on the backrest. The compact size did not cause the chair to be unstable when tilted. The tanks were well protected in the holder, which was even lined with cloth to provide a snug fit and prevent rattling.

Enriched Environment Chambers for Research in Neurological Deficit Rehabilitation

Enriched environment chambers were created for the Neurological Research Institute at the University of Ottawa to assess the impact of enriched environments post-stroke. The experiments to be conducted required two chambers, each with four compartments. The walls and ladders were made of galvanized wire in half inch mesh. One third of the floor in each compartment was covered with plexiglass. Each chamber also included a food dispenser, two removable trays to collect droppings, and hinged doors with latches at the top and bottom.

2001 Research Showcase

On October 5, 2001 the Institute for Rehabilitation Research and Development (IRRD) held a Research and Development Day. The goal of the day was to provide an opportunity for staff of The Rehabilitation Centre (TRC) and IRRD to meet and share with each other what they had been doing in research and development, and to discuss future directions, initiatives and trends. Staff were invited to present any recently completed research and development projects along with other innovative ideas in the field of rehabilitation. The organizing committee did a great job at promoting participation and a full day of activities was held. This included eleven paper presentations, three workshops, twenty-one posters and three demonstrations. The majority of presenters were staff and physicians from TRC along with faculty and students from the School of Rehabilitation at The University of Ottawa many of whom are research associates with IRRD. Below is a short summary of the paper presentations.

Dr. Dan DeForge, Physiatrist-in-Chief at TRC and Chair of the Department of Physical Medicine and Rehabilitation, University of Ottawa started the day with a presentation of his research into the effect of medical cannabis on spasticity and neurogenic pain in spinal cord injury. This presentation was well received and sparked a lot of interest amongst audience members.

Shelly Bercovitch, Senior Physiotherapist on the Neurospinal Service, presented work related to her Masters thesis on the impact of ambulation on health-related quality of life in spinal cord injury. Shelly's work was motivated by her years of clinical observation of this population and their apparent success or lack of success at integrating into normal living post injury.

Continuing with the quality of life theme, Dr. Joyce D'Eon, Discipline Leader of Psychology, presented on measurement issues in the asessment of quality of life in people with chronic pain. Dr. D'Eon not only introduced the audience to the issues related to measurement but also introduced them to some leading edge tools to measure quality of life.

Dr. Lucie Brosseau, Associate Professor at the School of Rehabilitation Science, University of Ottawa, and Dr. Hillel Finestone, Physiatrist with the Sisters of Charity of Ottawa presented a very interesting paper on the development of Evidence-Based Clinical Practice Guidelines (EBCPG) for post stroke physical rehabilitation interventions. Dr. Brosseau is an Ontario Ministry of Health Career Scientist and is recognized as an international expert in the development of EBCPG.

Jennifer Nymark presented an overview of the neurological gait research that has been conducted at TRC over the past 20 years, highlighting the multi-centre trials in which the team has participated. She also discussed the current multi-centre trial, funded by the National Institutes of Health, into the efficacy of body weight support for early training of spinal cord injured clients. The presentation concluded with a view to the future.

Dr. Heidi Sveistrup who is currently an Ontario Ministry of Health Career Scientist and is also with the School of Rehabilitation Science at the University of Ottawa, presented her research into the study of balance. She summarized some very interesting work that piqued the interest of all participants in the audience.

Dr. Joan McComas, of the School of Rehabilitation Science at the University of Ottawa, kicked off the afternoon sessions. She presented on the development of virtual reality systems and their use in rehabilitation. These systems can be used to improve spatial abilities, orientation, navigation, range of motion and motor learning in clients, as well as promote disability awareness for individuals learning about disability.

Dr. Ed Lemaire of TRC presented his research on the use of Internet streaming in continuing education. By improving the quality and speed of interactions, Internet streaming enhances continuing education.

Lillian Delmas, Nurse clinician with the Musculoskeletal Rehabilitation Service of TRC, presented on the development and implementation of a specialized diabetes education program for rehabilitation clients. The program has been successfully implemented at TRC for several months.

Dr. Keith Wilson, a Psychologist at TRC, presented on “enhancing dignity at the end of life”. Dr. Wilson is a recognized expert in the field and is currently participating in a multi-centre investigation of the efficacy and process of a new psychological treatment for individuals who have Amyotrophic Lateral Sclerosis.

Dr. Shawn Marshall, Physiatrist and Clinical Director of the Brain Injury Service at TRC, gave the final presentation of the day. He presented work that he had completed as part of his Masters in Epidemiology on the evaluation of restricted driver licensing for medical impairment in Saskatchewan.

During a catered lunch, over 90 participants viewed the various posters and demonstrations and had a chance to discuss them with the presenters. The posters represented a wide range of topics in rehabilitation from a variety of disciplines and interdisciplinary teams.

Participants also had an opportunity throughout the day to participate in three hands-on workshops. Julianne Labreche, a Speech Language Pathologist at TRC, along with her therapy dog Paugan, presented on the use of animal-assisted therapy for adults with aphasia. In the Gait and Motion Analysis Laboratory, an experimental weight-supported treadmill protocol was demonstrated with a client. The therapeutic benefits of pet visitation and recreation were presented by Caryn Johnston, Paula McLeod and Cindy Deslauriers of the Therapeutic Recreation Service at TRC.

The entire day was very well received and the work of the organizing committee of Dorothyann Curran, Carolyn Cook, John Landry, Ed Lemaire, Penny Pepin, Donna Kettyle, Debra Schleyer, Toby Yan and Timothy Andrade was appreciated by all.

Dr. Joyce D'Eon, Psychologist and Dr. Dan DeForge, Physiatrist-in-Chief discussing one of the 21 posters on display.

Sue Balmer and Dr. Ed Lemaire of IRRD, with Meredith Wright of The Ottawa Hospital.

Paugan, the therapy dog, poses for a picture during a hands-on workshop on animal assisted therapy.

Dr. Shawn Marshall, Physiatrist, presenting his research on restricted driver licensing for medical impairments in Saskatchewan.

Dr. Jamie MacDougall, TRC's Director of Research and Dr. Claire-Jehanne Doubouloz, University of Ottawa.

TBI Integration Pilot Project

In February 2001, the Ontario Ministry of Health and Long Term Care sent out a request for proposals (RFP) seeking innovative ideas to improve the Ontario rehabilitation system. A research team, supported by the Rehabilitation Network of Ottawa Carleton (RNOC) and led by Dr. Dan DeForge, compiled a strong application and in late summer 2001 the team was informed that this proposal was one of four selected from across Ontario.

The RFP targeted specific rehabilitation issues to be addressed, including access to services, lack of information, human resource issues and gaps in service. These issues were intended to be addressed within the structure of a new service delivery model that was outlined in a report to the Ministry entitled "Managing the Seams". The projects selected would require evidence of extensive client input in their design and be responsible for developing and promoting the integration of a continuum of rehabilitation services as well as exploring new ways to address accessibility to rehabilitation services.

The focus of the pilot project submitted by this team is the transition of clients with traumatic brain injury (TBI) through the health system, or 'management of the seams' in the Champlain District. Many persons with traumatic brain injury fall through the cracks of our health care system. This may be due to numerous factors such as less attention being given to the initial brain injury in favour of treating more overt physical injuries or the inability of health care providers to receive up to date information on clients with brain injury. There is also the fact that some brain injured clients spend years in the community before attempting to seek help.

In October 2001, this project was approached by the Ontario Neurotrauma Foundation with more money to expand the original focus from adult TBI to include pediatric clients. By the middle of November a steering committee had been created and things were well underway. The project team had met with the Ministry representatives and had begun creating the first survey tools for outcome measurement for the project.

It was clear that a unique perspective was required to oversee the day to day direction of the project and it's mandate. The Project Manager, Beverly Leeks and the Clinical Coordinator/Educator for the project, Elly Nadorp, have worked tirelessly since they came on to the team to keep the project on track. To address crucial transition factors, the team felt that establishing a central database for brain injured clients was a necessity. This database could be accessed via the internet and used as a web-based referral tracking system that would be helpful in facilitating referrals to other agencies or service providers. For health care providers this would be a true asset to those working with persons having a brain injury. Contained on the same website would be a central resource for information on the care and services offered in the Champlain District for clients. Helpful links would offer general information on brain injury and other useful websites for clients, caregivers and service providers. The Clinical Coordinator/Educator would be available as a resource to both clients and service providers looking to enter the referral tracking system and would also play a central role in the maintenance of the system and ensuring it's smooth operation.

Stakeholder input was a very important aspect of the project design. The first focus groups were held in mid-December and a total of seven were held in the Champlain district. These focus groups captured the needs and ideas of clients, caregivers and service providers from 3 distinct categories; urban and rural, French and English, and adult and pediatric. Information from these groups was used in almost all aspects of the project, from developing the intake/ referral forms to creating specific features on the new website. Website development began in January of 2002 and due to the enthusiastic support of the project by RNOC, it was decided that the client and service provider access would be set up through a new RNOC website.

Various working groups were created to attend to specific aspects of the project; for example, the 'Common Forms' working group brainstormed to develop the hard copy forms that service providers would use to collect the referral data from clients. The forms were then offered to others outside the working group for feedback. Templates of the forms were than created for the web database. This structure allowed for efficiency of time and energy, while making good use of expertise.

One of the crucial requests to arise from the client and caregiver focus groups was to ensure client confidentiality, especially within the parameters of the web-based database. To meet this requirement, four distinct levels of security were established to ensure that only service providers who have permission to do so are able to access data for a specific client. At the same time, other aspects of the website were required to be easy to access. The pages that clients and caregivers stated would be the most useful to them, such as the Helpful Links and the Care and Services pages, offer special search functions that enable people to find information on care, services and various other resources quickly and easily.

Working with the service providers to develop the forms and the various instructional protocols for the tracking system revealed that the greatest concerns were time to fill in the forms and ease of access to information on the website. To address these issues, several training sessions designed for service providers were held in March and April of 2002 throughout the Champlain district to introduce them to the project and to promote the ease of use of the system. Service providers can access the website or they can choose to go through the Clinical Coordinator/Educator by fax or telephone in order to enter clients into the referral tracking system or obtain information on clients that they are allowed access to.

A ‘mock trial' designed to introduce the website and the mechanics of the referral tracking system to clients, caregivers and service providers was held on March 4th. Each group was given information in a fashion that each would find appropriate to their needs. Feedback from this trial then prepared the project team to do a public launch of the project and it's accomplishments-to-date on March 20th.

Stakeholders are currently beginning to use the system, the website and the Clinical Coordinator/Educator. Data will be collected over the next few months to determine the success of the project.

It is anticipated that this web-referral model will be easily expanded to include acquired brain injury (ABI), spinal cord injury and other specific client populations that are seen in the field of rehabilitation. For more information about the project, please visit our website at www.rnoc.ca.

Dr. Dan DeForge presenting a project overview to stakeholders at the public launch

Ministry representative, Angela Chan, with Beverly Leeks, Project Manager.

Hands on workshop to introduce service providers to the new website.

Elly Nadorp, Clinical Educator/Coordinator for the project, with team members Dorothyann Curran and Mark Ferland.

NOTES