

# Caritas Research

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**T**his issue of Caritas Research reveals the broad nature of research at Caritas, but also the collaboration that occurs with Capital Health and the University of Alberta. All projects highlighted reinforce our commitment to innovative patient care utilizing clinical research to achieve our mission.

Dr. Fred MacDonald, Caritas Research Centre

## Integrating research into a continuing care setting

It's a subject no one really wants to talk about. About half the people who require long-term, in-dwelling catheters experience problems with them—blockages, encrustation and the formation of sediment. Discomfort, pain and infection can result. In serious cases, infection can even lead to death.

In the continuing care environment, catheter problems are a constant challenge for residents and healthcare professionals, says Janice Chobanuk, a nurse who specializes in palliative care. "Our standard practice for a blocked catheter is to try to open it up by irrigating with sterile salt water. If that fails, we replace the old catheter with a new one. It's not pleasant for the resident or the nurse. And there are costs related to irrigating catheters and changing catheters."

The situation crystallized in Chobanuk's mind a few years ago when she was working on the 9Y hospice at the Edmonton General Continuing Care Centre. "I was caring for a dying patient and had to change their catheter because of a blockage. The discomfort and trouble was significant, and interfered with our goals for palliative care. 'There must be a better way', I thought."

At the time, Chobanuk had started a Master's degree in Nursing at the University of Alberta. As part of a research course, she undertook a literature review on catheter practices. She found that in Great Britain a mildly acidic solution called ContiSol is used proactively to flush out catheters. The experience of healthcare workers there suggests that ContiSol reduces the need for frequent catheter changes.



*Janice Chobanuk with a resident from 9Y*

Now, Chobanuk is following this up as a member of an international team running a clinical trial to compare the effectiveness of three catheter procedures: replacement with a new catheter, proactive irrigation with a saline solution, and proactive irrigation with ContiSol. The principal investigator is Katherine Moore, RN, PhD, an associate professor in the Faculty of Nursing at the University of Alberta. She is well known in Canada, the US and the UK for her work on intermittent catheterization in the clinical setting. The team hopes to enroll 120 patients in the study. Chobanuk has eight patients enrolled at the Edmonton General, with each patient randomly assigned to one of the three groups. Data analysis will begin in the fall of 2005.

*continued page 2*

“The beauty of an international study is that you have a large sample size so the data are more useful,” says Chobanuk. “We’ll be looking at outcomes—does the catheter stay in longer, how often it is irrigated, what is the patient satisfaction with each procedure. We also have the opportunity to look at some additional issues and do more scientific investigations. For example, there is a suggestion that urine that is more alkaline is more susceptible to catheter blockages—so we’re testing urine pH as part of the study. As well, one of the investigators is doing microscope studies of the slices of the catheters we remove.

“Unfortunately, catheters are a fact of life for some people. The goal of this research is to expand our understanding of catheter practices so we can improve care.”

Chobanuk is currently writing her Master’s thesis and plans to be finished by the end of this year. “Doing research

makes me feel like a kid again because I’m asking questions. We have policies that specify how things should be done. But why are we doing them? Is there evidence to support the practices? Should we be doing things differently? If we don’t do research that asks these kinds of questions, we’ll never know the answers.

“Research isn’t often integrated into the continuing care setting, so it’s a challenge to get studies up and running. But it is just as important to ask these questions here as it is in an acute care setting. Our residents deserve it.”

*Janice Chobanuk is a Clinical Educator in end-of-life palliative care, Edmonton General Continuing Care Centre, Caritas; Palliative Program Leader for the East Central Health Region; and Shift Manager, Cross Cancer Institute, Alberta Cancer Board.*

## Study of community-acquired pneumonia a first in Canada

In this day of powerful antibiotics, it seems surprising that pneumonia still makes it into the top 10 leading causes of death in North America. “Ask anyone on the front lines of medicine, and they’ll tell you that pneumonia is a very common illness with considerable morbidity and mortality,” notes Dr. Tom Marrie, a world authority on community-acquired pneumonia (CAP) and Dean of the Faculty of Medicine and Dentistry, University of Alberta. “It’s been a research interest of mine for years, and there’s a lot of work that still needs to be done in order to improve patient outcomes.”

Community-acquired pneumonia refers to pneumonia acquired outside a hospital. There are more than 100 microbial causes of CAP, and patients present with a spectrum of symptoms. The majority of patients with pneumonia are treated presumptively, without knowing the exact cause of their pneumonia.

Given the problems with making a diagnosis of the exact cause of pneumonia, it’s not surprising that there is a wide variation in treatments among hospitals and individual doctors. Dr. Marrie and his team set about studying this variation with a view to improving care by standardizing treatment. They developed a comprehensive **pathway**—a management strategy specific to CAP that defines the essential steps of a complex care process. The steps include diagnostic testing, antibiotic therapy, oxygen therapy, and admission and discharge criteria.

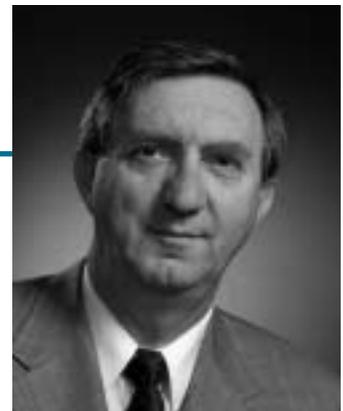
In 2000, the team embarked on a prospective study of all adult patients with CAP who were managed in the seven emergency departments in Capital Health. Patients 17 years of age and older were enrolled in the pathway if they presented to one of the hospitals and were clinically

diagnosed with CAP of sufficient severity to require hospital admission. Certain patients were excluded from the study, such as pregnant and nursing mothers and immunosuppressed patients. This was the first comprehensive study to examine the rate of pneumonia presenting to emergency departments in a large Canadian city.

Results show that patient outcomes improve when the pathway is followed—mortality is reduced and hospital stays are shortened.

“It was a gigantic project—we enrolled 9000 patients over two years,” notes Dr. Marrie. “We’ve already published 17 papers based on the data. Topics include patient management, blood culture, antibiotic treatment, risk factors for mortality, home care, chest x-ray and epidemiology. And we have a couple more papers in the works.”

Dr. Marrie is also pursuing long-term research aimed at solving the diagnosis problem in pneumonia. Blood cultures for pneumonia have only a 6-10% positivity rate. Sputum testing has other drawbacks—only about one-third of patients produce sputum, and it can be easily contaminated by bacteria in the mouth. In collaboration with other U of A researchers, Dr. Marrie is investigating the use of nuclear magnetic resonance (NMR) to detect products in urine that would identify the microbial agent causing the pneumonia.



*Dr. Tom Marrie*

Dr. Marrie began his medical career as a family practitioner in Newfoundland, and made the move to academic medicine when he was recruited to the Faculty of Medicine at Dalhousie University. He came to the University of Alberta in 1999 as Chair of the Department of Medicine, and became Dean of the Faculty of Medicine and Dentistry in 2004.

“My research has always been largely clinically based, which reflects my background,” he says. “I’m interested in doing research that translates into better outcomes for patients with CAP.”

## *Team work key to research success*

Developing a comprehensive pathway for the management of community-acquired pneumonia (CAP) is not a one-person job. No one knows this better than Dr. Tom Marrie, the project leader. “We wouldn’t have been able to do this without a multidisciplinary team—physicians, nurses, pharmacists, respiratory therapists and dieticians. We all worked together.”

Dr. Marrie notes that participation of front-line staff in all the Capital Health hospitals made it possible to collect the research data. In particular, six research nurses were hired to assist with pathway implementation, collect data and perform standardized follow-up phone calls.

Lynne Korobanik was one of these nurses. Korobanik’s background was in emergency nursing, and she had not worked

as a research nurse until the CAP pathway job. “I was looking for a different kind of opportunity, and this was perfect for me,” she says. “It was a big job with many different aspects—that made it challenging, but also interesting.

“I really believe in the benefits of standardized care for patients. It felt good to be involved in a project that made a significant impact on quality of care.”

With the initial pathway research complete, Korobanik now works with Dr. Marrie on a number of CAP-related research projects. She also works two days a week in the pre-admission clinic at the Misericordia Hospital. “Research gives you a different outlook on health care,” she says. “I find it keeps my brain in gear.”

## COMPRU: On the leading edge of head and neck reconstruction

Drs. Gordon Wilkes and Johan Wolfaardt knew they were on to something. The two Edmonton specialists had seen what craniofacial osseointegration could do to improve the quality of life for patients who require head and neck reconstruction. In 1988, Dr. Wilkes, a plastic surgeon, and Dr. Wolfaardt, a prosthodontist, travelled to Sweden to train with the pioneers of craniofacial osseointegration and bring the technique back to Edmonton.

A donation from the Mayfield Rotary Club allowed them to buy some necessary equipment. Dr. Wolfaardt did the planning and prosthesis work at the University of Alberta’s dental school and Dr. Wilkes performed the surgery at the Misericordia Hospital.

“It was a tough existence, going back and forth between the two locations,” recalls Dr. Wolfaardt. “We knew we needed a home base.”

After some time, Alberta Health and Wellness funded patients on a case-by-case basis, but saw the potential to do more. Dr. Wolfaardt credits the ministry with having the foresight to invest in a more comprehensive approach to craniofacial osseointegration. (The technique uses titanium implants in bone as the points of attachment for a facial prosthesis.) In 1992, Alberta Health and Wellness provided funding to set up a province-wide service—the Craniofacial Osseointegration and Maxillofacial Prosthetic Rehabilitation

Unit (COMPRU) at the Misericordia Community Hospital operated by Caritas Health Group. Drs. Wilkes and Wolfaardt are co-directors of the unit.

“One of the key decisions was to incorporate a research component into COMPRU right from the start,” continues Dr. Wolfaardt. “While there had been work done on implants in jaws, there was little research on facial implants. We saw a lot of potential here. We thought that Alberta could make a major contribution.” So COMPRU was established to be a centre of excellence that would be known internationally for both its clinical work and for its research.

In fact, the COMPRU research group was formed before any patients were treated. It was made up of researchers from the U of A Faculties of Medicine and Dentistry, Engineering and Rehabilitation Medicine. As a start-up group, the team had two strikes against it: no track record that could help with securing grants, and competition from already-established



*Dr. Johan Wolfaardt*

Images courtesy of Richard Siemens, Creative Services, University of Alberta



*Mr. Raymond Giguere, Osseointegration Technologist, COMPRU (left) and Ms. Rosemary Seelaus, Anaplastologist, COMPRU (right) working at the CNC Milling Station in the Anaplastology Laboratory, using CAD/CAM technologies for ear reconstruction planning.*

related research groups. As a result, building the research program was a challenging and long-term undertaking.

“We got by on a very lean budget and a tremendous amount of goodwill,” says Dr. Wolfaardt. “We had to be entrepreneurial with research funding. Our work was too new to win funding from conventional granting agencies. So we relied heavily on non-traditional funding: charitable donations and in-kind support. We couldn't have done any of this without the people who donated their time to our research.”

From the outset, COMPRU concentrated on building its intellectual capital. It developed strong relationships with people in a wide range of disciplines in the faculties of Medicine and Dentistry, Rehabilitation Medicine, Engineering, Education and Art and Design. Through Caritas Health Group, it forged a number of joint appointments with academics at the U of A. Drs. Wolfaardt and Wilkes watched people coming out of PhD programs, and encouraged them to join the team.

“We approached the research development of COMPRU slowly and purposefully. Building, attracting and retaining intellectual capital for research is typically a long road, and we stuck with it because we believed it would pay off. This is what has begun to happen in the past 2-4 years. At the beginning, it was very hard to attract graduate students. Now our researchers attract top-tier candidates because of the research program we've developed. Not much goes on internationally in COMPRU's area of work without us being involved or consulted. Things are really accelerating.”

One of the key innovations pioneered by COMPRU is the use of digital technologies in head and neck reconstruction. Explains Dr. Wolfaardt: “Once you have a patient in head and neck reconstruction involving bone-anchored implant biotechnology, you have them for life because you will have to monitor the implants and remake prostheses. As you get more patients, you'll have to add staff and facilities to accommodate their needs. Eventually there will be gridlock. To overcome this problem, we needed to increase treatment efficiency and improve technical quality. So

we started to pursue advanced digital and manufacturing technology solutions for everything from simulating surgery, designing treatment, to producing facial prostheses.

“There was tremendous resistance to this idea, people claimed we were removing the art from medicine. But we believed differently—we saw the potential to speed up time-consuming, manual work. Our instincts have proven correct and our group has reshaped thinking internationally in this area. We have held two unique international conferences on this subject and have linked with several other international centres that hold similar interests. As a result of this work, the use of advanced digital technology is now on every conference program in our field and has rapidly become mainstream thinking.”

Another important COMPRU innovation is measurement of the outcomes of reconstructive procedures. This research area addresses the fact that very little is known about how complex reconstructive surgical procedures and radiation therapy really work for patients to be able to swallow, chew or speak. Dr. Jana Rieger leads this effort and is expanding the research through her work in the Head and Neck Surgery Functional Assessment Laboratory.



*3D Laser Scanning Station in the Medical Modeling Research Laboratory (MMRL). The laser scanner allows non-invasive capturing of surface features in 3D. Stephanie White-Downey, Clinical Assistant, COMPRU and a person being scanned.*

As the research program has grown, COMPRU is contemplating its next step. “Integration is key to future success,” says Dr. Wolfaardt. “We'd like to bring our research efforts into a highly vertically integrated centre that is based around advanced digital technologies in medical visualization and manufacturing through a directed research model that is tuned into technology transfer. We've got many of the pieces, we're looking to strengthen them and bring them together in this model. It would focus on a select group of platform technologies that would allow us to take basic science into the clinical environment.

“This is blue-sky thinking now. However, we do have the intellectual assets around us to initiate such a centre. Sustainable funding will be the critical issue. We think we can do it. After all, if we'd listened to all the naysayers 15 years ago, COMPRU wouldn't exist today.”

## *Profile in excellence: COMPRU laboratories*

The research program at COMPRU is interdisciplinary and involves both basic science and applied research. Six main labs support the research program and clinical services.

**Interfacial Biomechanics Lab**—develops new techniques to evaluate the quality of the interface between the bone and implant. COMPRU, together with the U of A Faculty of Engineering and Caritas, has established the COMPRU/Westaim/ASRA Chair in Interfacial Biomechanics. The establishment of the laboratory was funded by the U of A Faculty of Engineering.



*From back to front: Ryan Swain, PhD student, Mechanical Engineering, Faculty of Engineering, University of Alberta; Monique Sylvestre, Clinical Assistant, COMPRU and patient in the Interfacial Biomechanics Lab.*

**Head and Neck Surgery Functional Assessment Lab**—provides a special environment for equipment used to measure outcomes related to speech, swallowing and quality of life after reconstructive procedures for cancer, trauma and congenital conditions. This service is unique in Canada. It was established with funding through the

Caritas Hospitals Foundation, the U of A Faculty of Rehabilitation Medicine and the Minerva Foundation of Edmonton.



*Dr. Jana Rieger working with a volunteer graduate student from the Faculty of Rehabilitation Medicine, University of Alberta, in the Head and Neck Surgery Functional Assessment Laboratory (HNSFAL).*

**Bone Conduction Amplification Lab**—supports research on bone-anchored hearing aids. These surgically implantable devices treat hearing loss through direct bone conduction. The lab was established with funding through the Caritas Hospitals Foundation and the U of A Faculty of Rehabilitation Medicine.



*Mr. Bill Hodgetts performing technology assessment on bone anchored hearing devices in the Bone Conduction Amplification Laboratory (BCAL).*

more COMPRU laboratories on page 6

## COMPRU laboratories

**Medical Modeling Research Lab**—conducts research into using imaging data to create three-dimensional virtual or physical models of patient anatomy. This is the first lab of its kind in Canada. It was established with funding from Western Economic Diversification Canada and additional support from Caritas Health Group.



*A view of several rapid prototyping devices in the Medical Modeling Research laboratory (MMRL).*

**Anechoic Chamber**—a specialized chamber for measuring sound, which eliminates any echo, room reflections and boundary effects. It is on loan to COMPRU from the U of A Faculty of Engineering.

**Stomatognathic Function Lab**—assesses jaw function after reconstructive surgery for cancer, trauma and congenital conditions. It was developed by grant funding received from the Alberta Heritage Foundation for Medical Research by Dr. Jana Rieger



*The Stomatognathic Function Laboratory houses equipment that is essential for understanding the intricacies of jaw motion and jaw muscle function before and after intervention.*

## Did you know that?

- COMPRU was initiated in 1989 by Dr. Gordon Wilkes and Dr. John Wolfaardt with a \$25,000.00 grant from Mayfield Rotary.
- The first craniofacial osseointegration patient was treated for an ear prosthesis by Dr. Wilkes and Dr. Wolfaardt in November 1989.
- The COMPRU facility was established by Alberta Health in September 1993 at the Misericordia Community Hospital.
- COMPRU, through Caritas Health Group brought the first hyperbaric oxygen service to the prairies.
- COMPRU developed the first CT scanning implant planning service in western Canada.
- COMPRU initiated the awarding of an Honorary Doctorate to Professor P-I Brånemark by the University of Alberta. This was the first Honorary Doctorate awarded to Professor Brånemark in Canada.
- COMPRU was reportedly the first publicly funded group in Canada to register an ISO 9000 Quality System.
- COMPRU was the first group to internationally register an ISO 9000 Quality System for clinical aspects of osseointegration (intraoral, extraoral and BAHA®).
- COMPRU established the COMPRU Research Group (CRG), which involves five faculties at the University of Alberta, as well as, international researchers.
- COMPRU is the only area in Caritas Health Group to have been an Alberta Science and Technology (ASTech) Award finalist.
- COMPRU brought video conferencing to Caritas Health Group.
- COMPRU has registered over 1900 patients and has referrals from across Canada.

# Telehealth helps patients breathe a little easier

For those suffering from Chronic Obstructive Pulmonary Disease (COPD), drawing a breath can be a frightening struggle. Because the disease makes it difficult to move air into and out of the lungs, COPD is a seriously debilitating condition.

While there is no cure, respiratory rehabilitation programs can help people cope with this disease. One of the most successful is the Breathe Easy program operated at the Caritas Centre for Lung Health at the Edmonton General Continuing Care Centre. Breathe Easy takes a multidisciplinary approach to patients through education, exercise, self-management techniques and coping skills. Independent research has found that the program is both cost-effective and makes a significant improvement in quality of life.

But what about COPD patients who live outside Edmonton and can't get into the city to participate in an organized respiratory rehabilitation program? Technology—in the form of telehealth—is coming to their aid.

“Telehealth, in part, uses videoconferencing to deliver clinical services,” says Dan Huffman, Capital Health's Director of Regional Patient Transport, Patient Simulation and Regional Telehealth. “It's an effective way to reach isolated patients and ensure that they have access to the same quality of care available in Edmonton.”

COPD rehabilitation via telehealth has just started as a two-year pilot project. Patients enroll in a program that involves three sessions a week at a local site—usually a hospital or public health centre. Each session has a supervised physical rehabilitation component as well as a telehealth information segment on a COPD-related topic, or a telehealth meeting with a respiratory therapist. The program is tailored to the resources and equipment available at each site. The team hopes to enroll 80 patients in the pilot project. Partner regions for the project include Aspen Regional Health Authority, East Central Health, Peace Country Health, and the First Nations and Inuit Health Branch.

“We'll evaluate the results and then look to develop the COPD project as a continuing telehealth program,” explains Blayne Iskiw, Telehealth Director. “This is the way we have introduced all our telehealth clinical programs. We make sure everything is working correctly before we roll them out.”

COPD is one of four telehealth projects currently being piloted by Capital Health. The others are Digital Cardiac, Pediatric Sleep Disturbance and Urogynecology. Continuing programs include: Cardiac EASE, Child Health, Geriatrics, Lung Cancer, Rehabilitation, Renal, Stroke, Virtual Asthma, Pixelere Mobile Wound Care, Tele-Ophthalmology, Dermatology, Urology, and Forensic and Urgent Telepsychiatry.

Patient satisfaction has been surveyed for all the continuing programs and is very high, notes Huffman. “Telehealth addresses key issues of wait lists and accessibility to services”.

“Nonetheless, we recognize that telehealth is not the answer for every condition. We want to make sure we use



*An example of telehealth videoconferencing at work*

telehealth appropriately.” Capital Health is taking a lead role in testing telehealth standards with the Canadian Council for Health Services Accreditation.

Clinical services are not the only telehealth applications. Telehealth is also used for educational services, such as continuing medical education sessions for clinicians in remote areas, and to connect multiple sites for administrative meetings. Capital Health has over 35 telehealth videoconference sites, and there are more than 280 sites in total in Alberta.

Over the next year, the telehealth network will switch to Alberta SuperNet as its backbone. This high-speed network will further improve service. “SuperNet will make desktop videoconferencing a reality, increasing accessibility even more,” adds Iskiw. “The technology in this area is changing rapidly, which makes it an exciting time to be in telehealth. It really is a new frontier.”

## *Spotlight on COPD*

Chronic Obstructive Pulmonary Disease (COPD) includes two major diseases—chronic bronchitis and emphysema—and generally affects people over 60. It affects more women than men. COPD is caused by cigarette smoking, occupational exposure to dusts, and possibly outdoor air pollution. Approximately 15-20% of smokers will develop COPD.

Of all respiratory disorders, COPD is the most prevalent with more than 35 million people affected worldwide. It is the fourth leading cause of death in North America, and is expected to take the number three spot by 2020. The Canadian Lung Association notes that COPD is on the rise in Canada. Already, more than 750,000 Canadians suffer from the disease.

# Caritas Nurse Scientist

Donna Wilson, RN, PhD is a full professor in the Faculty of Nursing, University of Alberta. She is an active nurse, educator, and researcher. Her program of research focuses on health policy and health services for seniors. She was very pleased to be selected for a Nurse Scientist joint appointment with Caritas. Her orientation will include

assessing interest in research and further education among Caritas nurses, and exploring the use of Caritas health services by seniors. She looks forward to her role of helping foster research at Caritas. She can be contacted at (780) 492-5574, [donna.wilson@ualberta.ca](mailto:donna.wilson@ualberta.ca), or through the Caritas Research Centre.

## Research Day 2006

The 2nd annual Caritas Research Day is Thursday,

January 26, 2006 at the Grey Nuns Community Hospital. The theme of the day is integrating research into clinical practice.

Guest Speakers include:

- Dr. Lorne Tyrrell, Professor CIHR/GSK Chair in Virology, Department of Medical Microbiology and Immunology, University of Alberta

- Dr. Carole Estabrooks, Professor & Canada Research Chair in Knowledge Translation, Faculty of Nursing, University of Alberta
- Dr. Thomas Feasby, Vice President, Academic Affairs, Capital Health and Associate Dean, Faculty of Medicine & Dentistry, University of Alberta
- Dr. Cliff Sample, General Surgeon

In addition, a variety of presentations highlighting various research projects involving Caritas will be

## e-Library – Healthcare information at your fingertips!

The following full-text resources have been added to the e-Library, at <http://www.intranet.cha.ab.ca/e-library/>

- **Images.MD** is an online encyclopedia containing over 48,000 medical images accompanied by descriptive and informative text
- **Your Journals@OVID**, via HKN, provides access to the full-text of over 200 medical, nursing and allied health journals

Contact the library staff for more information: Grey Nuns 450-7300, Misericordia 930-5708.



The articles in this newsletter were written by Connie Bryson. Connie is an Edmonton-based freelance writer specializing in science, technology and business topics. She is the winner of the 1999 ASTech Excellence in Science and Technology Journalism Prize.

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