Centre for HIP Health AND Musculoskeletal Research

- SURGICAL SOLUTIONS
- HIP FRACTURE PREVENTION
- EARLY DETECTION OF OSTEOARTHRITIS
- KNOWLEDGE TRANSLATION

Enhancing Hip Health Through Innovation

Complications and Costs Associated with Current Hip Surgery Procedures

Osteoarthritis affects 1 in 10 Canadians and hip osteoarthritis affects over 500,000 Canadians. Total hip replacement is the only treatment for those disabled by hip OA.

For those who have fallen and broken a hip, major surgery or total joint replacement is required.

Canada's annual rate of 20,000 total hip replacements will increase substantially as the population ages. Although total hip replacement is one of the most successful operations, major complications such as infection or bone loss around the implant still occur.

Surgical Solutions to Provide Hip Health

Minimally invasive techniques for faster recovery.

CHH surgeons including UBC Professor **Clive Duncan** and UBC Assistant Professor **Donald Garbuz** are leading developers of minimally invasive techniques for total hip replacement. This innovation halves the length of the incision so that patients suffer less muscle damage and pain and make a speedier recovery. However, small incisions increase the difficulty for the surgeon to place the total hip components accurately—and this is essential for long term patient satisfaction. CHH surgeons, together with bioengineer Associate Professor **Tony Hodgson**, are researching ways to refine minimally invasive hip replacement and incorporate computer-assisted surgery. Specifically, CHH researchers will develop surgical techniques and instrumentation to optimally place components with the smallest incision possible.

New implant technology to reduce complications

CHH surgeons including UBC Professor **Clive Duncan** and Associate Professor **Bassam Masri**, together with biomaterials researchers UBC Assistant Professor and Canada Research Chair in Material Science and Technology **Rizhi Wang**, are generating novel "bench to bedside" approaches to minimize the risk of infection. Although highly successful, infection complicates 0.5-1% of all total hip replacements and carries significant personal and financial implications as affected patients must undergo two further operations. To prevent, and also treat, implant-related infection, CHH surgeons and biomaterials researchers are developing antibiotic-coated implants that are hostile to bacteria.

Similar bench to bedside collaborations are bringing together biomaterials scientists, stem cell biologists (UBC Assistant Professor **Fabio Rossi**, Canada Research Chair in Regenerative Medicine) and surgeons to address bone loss that complicates revision surgery (replacement of a primary implant).

Innovative Laboratories in Surgical Solutions

Dedicated bioengineering laboratory
Computer-assisted surgery suite

Innovative Approaches in Surgical Solutions

Biomechanical modeling of living joints
Development of novel biomaterials

UBC Vancouver CoastalHealth Research Institute
Healthier lives through discovery

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