Patients who develop infections following hip and knee replacement surgery may benefit from a new type of prosthesis that releases built-in antibiotics until a new joint can be implanted.

Prostalac (prosthesis of antibiotic-loaded acrylic cement) hip and knee joints were developed over the past decade by Dr. Clive Duncan, head of the Department of Orthopedics at Vancouver Hospital, Dr. Bas Masri, Dr. Chris Beauchamp and Nancy Paris-Seeley, a biomedical engineer at the British Columbia Institute of Technology, and their colleagues. They have been tested on hundreds of patients at the Vancouver Hospital and the Mayo Clinic Scottsdale in Arizona, where Beauchamp now works. Health Canada approval has already been obtained, and approval from the US Food and Drug Administration is being sought.

About 1% of North American joint-replacement patients experience infections. Previously, patients needed bed rest and a course of antibiotics for several weeks. The only other option for in situ antibiotics has been “beads” of antibiotic-loaded cement, but the surgical and engineering team wanted to give patients a functioning joint along with the medication.

The main engineering challenge was to create a temporary joint, explained Paris-Seeley. The researchers wanted a simple press fit, similar to home-made Popsicle moulds, that could be inserted and popped out later. The eventual solution was to create a set of small, medium and large moulds. The joints are made in the operating room, where the surgeon chooses the antibiotic, powders it and combines it with bone cement, then sets it in the appropriate mould. Stainless steel is used for the stem parts of the joints and the cement coating interfaces with the bone surfaces. “We wanted to go with inexpensive materials that would do the job,” says Paris-Seeley.

The procedure takes about 20 minutes longer than conventional joint surgery. Surgeons are “very enthusiastic” about the devices, says Duncan. He says the antibiotics are “extraordinarily effective” because a huge dose stays in the infected area while the rest is absorbed very slowly into the bloodstream.

Duncan says the joints reduce the length of hospital stay from 18 days if the patient is resting in bed without an artificial joint to 6 days. Rehabilitation time is also considerably shorter. — Heather Kent, Vancouver

Canada’s pitiful ranking in imaging technology spurs project

Industry representatives, researchers and health professionals are uniting to map Canada’s future needs for medical-imaging technology. Industry Canada, which brought these divergent players together for its Medical Imaging Technology Roadmap project, hopes to identify technologies that will meet market demand and improve patient care over the next 4 to 10 years. “Improving medical care has been married with making industry more competitive,” says project facilitator Diane Law. The completed roadmap is due in March 2000.

Dr. Brian Lentle, one of 68 roadmap committee members and past president of the Canadian Association of Radiologists, says the effort comes at a crucial time. “We’ve suffered from our failure to invest in technology,” says Lentle. “We have a substantial technical deficit now that is a problem.”

Canada recently slipped to the bottom one-third of countries in the Organization for Economic Co-operation and Development in terms of technology availability. With CT scanners, for example, Canada ranked 21st among 28 countries; for lithotriptors the country ranked 19th among 22 countries, and for MRI machines 19th among 27 countries. “I wonder if health care is this expensive because we don’t fully benefit from (Continued on page 1383)