## Diagnostic advance with radioactive iodine – pilot project

A team of scientists at the University of British Columbia has received more than $150,000 to produce a form of radioactive iodine for use in hospitals in four Canadian cities. The radioactive iodine will enable specialists in nuclear medicine to increase significantly the number of disease conditions that can be diagnosed by radioactive means.

The pilot project, funded by the Department of National Health and Welfare, involves scientists at TRIUMF, the $32-million cyclotron located at UBC, and nuclear-medicine experts who hold joint appointments at UBC and the Vancouver General Hospital.

Dr. Don Lyster, a member of UBC's Faculty of Pharmaceutical Sciences who works at VGH, said the aim was to have a laboratory and production facilities operating at TRIUMF within six months.

UBC's TRIUMF cyclotron will produce iodine$^{123}$, a radioactive isotope with "a half-life of 13 hours". This means that within 13 hours the original amount of iodine will be only half as strong radioactively.

One of Dr. Lyster's problems will be to get the radioactive iodine to the Canadian hospitals where it will be used for diagnosing diseases by nuclear medicine experts.

"The $I^{123}$ we will airlift out of Vancouver will have lost half its radioactivity within 13 hours," he said. "Consequently, the full-strength solution that could be used in Vancouver on, say, ten patients, could only be used on five patients 13 hours later.

"The other Canadian hospitals will have to schedule patients at very specific times in order to make the best use of the radioactive iodine."

The radioactive iodine will be used at VGH, and will be sent to the W.W. Cross Cancer Institute in Edmonton, the Health Sciences Centre at Winnipeg General Hospital, and the Hospital for Sick Children in Toronto.

Dr. Robert Morrison, head of the nuclear medicine division at VGH and associate professor of pathology in UBC's medical school, said the radioactive iodine would enable his division to carry out many more diagnostic procedures.

"At present," he said, "nuclear medicine depends primarily on a radioactive element called technetium$^{99m}$, a decay product of radioactive molybdenum, which has a half-life of six hours." Patients are given minute doses of technetium, which has been chemically bonded to a substance that will concentrate itself at specific sites and in organ systems in the human body.

Once lodged at a site in the body, the technetium emits gamma rays, which are picked up by a special camera in the nuclear medicine division at the VGH. Equipment associated with the gamma camera produces a "scan", a photographic negative that looks something like an X-ray plate.

"If the organ is cancerous, the scan would show changes in position, shape and localized function. If we bond technetium to another molecule that has an affinity for bone, the scan would show a high deposition of radioactivity around a tumor, because cancer stimulates bone growth."

Technetium has disadvantages, however. "It's an element made artificially in fission reactors such as the one at Chalk River in Ontario," Dr. Morrison said.

"We're limited in the number of diagnostic procedures we can undertake because the chemistry of technetium is unusual.

"For instance, there are chemical substances that have an affinity for the liver. But when they're bonded to technetium, they won't concentrate themselves in that organ. Bonding the substance to technetium completely changes its properties and the body no longer recognizes it."

The nuclear-medicine experts will be able to scan many more organs using radioactive iodine. "We have 100 years of experience in the properties and chemistry of iodine, whereas we know little about technetium because it was discovered relatively recently," he said.

"Using iodine$^{123}$, we'll be able to scan for blood clots and heart disease because we can bond radioactive iodine to molecules that are unchanged in the bonding process and will be recognized by the body. It will also give us a greatly reduced radiation level and a much better scan picture than another form of radioactive iodine – $I^{131}$ – another commonly used isotope in nuclear medicine."

"Iodine$^{123}$ won't totally replace technetium in nuclear medicine," Dr. Morrison added. "It will complement technetium and significantly extend the number of procedures we can undertake."

## Canadian embassy in Kuwait

Secretary of State for External Affairs Don Jamieson announced on February 16 that Canada would open an embassy in Kuwait, probably within the next two or three months.

A resident embassy in Kuwait will fill a major gap in Canada's diplomatic representation in the Middle East. Kuwait and the other Emirates in that region have benefited greatly in recent years from considerably increased oil revenues, much of which are being used for economic and social development. As an exporter of technological goods and expertise, Canada is in a good position to supply many of the requirements of these programs. The new embassy will be able to assist Canadian businessmen seeking markets in the area.

Until the appointment of a resident ambassador, the Canadian Ambassador to Iran will continue to be accredited to Kuwait.

## Highways go metric

As the next step in the conversion from imperial to metric measurement, Metric Commission Canada is encouraging provincial governments to post highway speeds and distances in metric figures. Wary drivers seeking methods of adapting to confusing road signs are being taught to


*Something new has been added to Ontario's highways – speed and distance signs expressed in kilometres to replace miles as shown above.*