Photo: Daniel Gamache/NRC

Laser physicist Dr. Rod Taylor and colleague prepare laser fibre-optic catheters prior to surgery.

Dr. Keon's next goal is to avoid open-heart surgery by employing a procedure called angioplasty. The technique will enable surgeons to unclog blood vessels by inserting a laser-tipped catheter through an artery in the leg or the arm and threading it to the heart. The technology required for excimer laser angioplasty should be available in two to three years.

New Hope for Spinal Injury Victims

Life could become easier for a good many spinal injury victims following the recent development of a fixation plate that provides internal support to persons with severe damage to the front of the spine. The device, when surgically implanted and screwed into place, provides the stability and structure once possible to get only from a healthy human spine.

The Contoured Anterior Spinal Fixation Plate (CASF) was designed by Dr. Robin Black and his team from the NRC's Laboratory for Biomedical Engineering. Orthopedic specialists from the Ottawa Civic Hospital also collaborated in the effort.

Dr. Gordon Armstrong, former chief of orthopedics, and an Ottawa Civic Hospital surgical team have implanted the plate now in more than 20 patients. ''We are very optimistic about the results so far,'' says Armstrong. ''Existing bone plates are inadequate because they are too narrow and don't allow the positioning of more than two screws in each vertebra.'' The CASF plate, however, is contoured to fit snugly around the spine and is wide enough to allow the placement of at least three screws per vertebra. This in turn allows for stronger support.

NRC and Civic Hospital researchers have not stopped with the development of the CASF plate. In fact, the two institutions are currently collaborating on a new set of plates for the upper part of the spine and one that can be anchored to the pelvic bone. Help may be finally on the way for even more spinal injury victims.

Sophisticated Scanners

One of the most exciting of the new tools and techniques available to medical science today is the scanning system operating at McMaster University's department of nuclear medicine in Hamilton, Ontario. Known as Positron Emission Tomography (PET), the system recreates a shifting colour picture of the living human brain on a computer screen.

To operate the PET scanner, the patient is injected with tiny amounts of radioactivity which emit gamma rays that are picked up on a computer. The computer then processes the information it receives and translates it into a changing picture of the brain at work.

Thanks to McMaster's PET — one of three such systems in Canada — scientists for the first time can see precisely what is going on in a person's head. The revolutionary PET system has recently helped Canadian researchers make early diagnoses of brain tumours and major advances in the study of many neurological disorders. (Some aspects of this subject were mentioned in the summer 1988 issue of *Canada Reports*.)

Easing the Life of Wheelchair Patients

Accepting a disability and facing a new form of transportation — the wheelchair — can be a traumatic experience. While the electric wheelchair offers greater freedom for some disabled persons, learning to control this mobile mechanism can be a frustrating and time-consuming task.

But a joint effort by the University of Calgary, the Technical Resource Centre and the Alberta Children's Hospital in Calgary is helping to change all this.

The project is a computer program called the ''Wheelchair Simulator'' that enables electric wheelchair users to master their movements through the use of a computer with joystick that simulates real-life efforts to move along corridors and around obstacles.

The program, although still in its initial stages, is currently being used in therapy situations at the Alberta Children's Hospital. The first of its kind in North America, the program is being studied by a group in the United States which plans to develop a similar one.