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A further significant building block in the development of Canada's pharmaceutical industry is the outstanding nature of biomedical research that occurs in other Canadian institutions, namely:

### **Universities and Teaching Hospitals**

For its size, Canada has a university medical research base that is second to none in the world. There are 16 medical faculties in Canadian universities, and these are affiliated with a network of over 100 teaching hospitals and research institutes.

When one looks at Canada's research performance as measured by the publication record of Canadian scientists and the impact of their work on other scientists worldwide, a remarkable picture emerges. Canada, with a population less than half of the next smallest G-7 country, has the highest research productivity, efficiency and effectiveness and ranks second only to the United States in total impact per capita. As a result, the efficiency and effectiveness of Canada's research, especially in the biosciences, is greater than its nearest competitor - the United Kingdom - by 35 per cent and 30 per cent, respectively. The majority of Canada's pharmaceutical-medical science publications arise from university research supported by extramural programs of the government through its granting councils.

### **Contract Research Organizations (CROs)**

Canada has private-sector organizations that offer integrated packages of all the major services required by pharmaceutical and biotechnology companies to take a new drug through the developmental and regulatory process. Depending on their clients' requirements, these CROs can design and conduct some or all aspects of the development process. They offer services that include the whole development spectrum, from toxico-kinetic and metabolism studies through Phase I (human safety, pharmaco-kinetic and pharmaco-dynamic studies), to Phase II through Phase IV clinical studies. Bioanalytical support of each of these activities and the preparation of drug registration submissions to regulatory agencies in both the U.S. (Federal Drug Administration) and Canada (Health Protection Branch) can also be provided. As well, a large network of institutions can be accessed, where clinical trials can be conducted.

### **Clinical Trials**

Canada has an enviable capacity to perform globally competitive, cost-effective clinical trials, especially since full-scale medical examinations are covered by Canada's health-care system, and this significantly reduces the costs of such research. In this way, Canada is rapidly demonstrating a world leadership in the development and application of pharmacoeconomics. As well, innovative clinical trial networks provide industry with a direct entry into the drug delivery system for new pharmaceutical products.